Decision Usefulness of Goodwill Reported Under IFRS

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Preface and acknowledgements

This dissertation is the result of a long learning process. It started in 2004, when I was not yet a Ph.D. student, but a master student in accounting and finance. Two events this year were particularly important concerning my later Ph.D. work. In fall 2004 I began working on my master thesis in financial-accounting theory. This thesis got the final title "Accounting-based Measurement of Systematic Risk." When I worked on this thesis, I got familiar with normative and positive accounting research and, in particular, research on value relevance, information content and earnings management. I finally understood the importance of financial accounting as a low-cost provider of decision-useful information. At the same time, I recognised that financial accounting might be used as an instrument to mislead, not to inform stakeholders. Thanks should be given to my supervisor on this master thesis, Associate Professor Ole Skalpe, for introducing me to financial-accounting research.

The same fall, I started working as an instructor at Buskerud University College. During fall 2004 and the following year 2005, I taught almost 500 adult students in financial accounting. These students were full-time employees in the Norwegian Tax Administration. This experience was, and still is, tremendously important to me. It gave me insight in financial-accounting practise and regulation and a lot of experience as an instructor in financial accounting. I realised that a professional life in academia might be everything but boring. A special thank is, therefore, given to Randi Bjørnstad at Buskerud University College for having faith in me, even though I had the absolute minimum of experience as instructor.
Buskerud University College received funding for a Ph.D. scholarship in finance and accounting in 2006. This funding was provided by the local bank, Sparebank 1 Ringerike Hadeland. My former supervisor Ole Skalpe and my colleagues at

Buskerud University College, Associate Professor Leiv Blakstad and Assistant Professor Bjørn Solheim, encouraged me to apply for this scholarship. Early in January 2006, thanks to Ole Skalpe, I met who later became my Ph.D. co-advisor, Associate Professor Erlend Kvaal at BI Norwegian Business School. Erlend deserves a whole paragraph in this preface. He is, along with my principal advisor, the individual that has been most important in the process of carrying out this dissertation. He introduced me to the challenges in accounting for goodwill and, in particular, the recently implemented impairment-only method for goodwill under IFRS. Erlend gave me invaluable feedback on several drafts of my research proposal and later on my dissertation. I have benefitted from Erlend's impressive knowledge on international accounting regulation and standard setting and his sharp analytical and methodological reasoning capabilities. His comments and remarks are highly appreciated. I will give him my greatest thanks.

Erlend encouraged me to apply for admission to the Ph.D. programme in accounting at Copenhagen Business School (CBS). I got the approval to start as a Ph.D. student in early spring 2008. I have never regretted following Erlend's advice. At CBS I met my principal advisor, Professor Christian Vriborg Petersen. Like Erlend, Christian deserves a whole paragraph on his own. He has enthusiastically contributed with insightful comments and remarks in all stages of this dissertation. Christian is particularly concerned with the implications financial accounting has for decision making. His deep knowledge on financial-statement analysis and thereby the valuation and stewardship uses of financial accounting has made me think carefully about the practical implications of financial accounting and financial-accounting research. We have had numerous meetings discussing all kinds of topics within financial accounting, not limited to those concerning this dissertation. These meetings have been extremely valuable to me.

They have given me deeper understanding of the concept of decision usefulness in accounting and have made me realise that financial-accounting research should provide some insight relevant for financial-accounting standard setters, preparers and users. Without his and Erlend's help, there would not have been any dissertation today.

There are also others that deserve acknowledgement. Special thanks go to Professor John Christian Langli for being my discussant at my pre-defense. He gave me numerous suggestions for further work. These suggestions are highly appreciated. I have also benefitted from comments and suggestions from Professor Jens Oluf Elling and Professor Thomas Plenborg at CBS, Associate Professor Steinar Sars Kvifte at NHH/Ernst & Young, Professor Frøystein Gjesdal at NHH and Professor Kjell Henry Knivsflå at NHH. I also want to thank participants at four research seminars at which I presented my project: The doctoral colloquium at Norwegian School of Economics (NHH) in 2007, my mid-term Ph.D. seminar at CBS in 2009 and two research seminars at BI Norwegian Business School and Ernst & Young Oslo, both in 2010.

Special thanks are given to Professor Sherry Robinson who invited me for a three month stay at Pennsylvania State University in spring 2011. These three months were essential in order to complete my analysis and write up my dissertation. Thanks also to, Dolores, Paul and Thomas, in the "attics" at PennState for keeping my spirits high in the final stage of this project.

I will also give thanks to some of my colleagues at Buskerud University College. Special thanks go to Associate Professor Leiv Blakstad for having time to discuss all kinds of topics within economics, politics and philosophy. These discussions have been very valuable to me. Special thanks should also go to Associate Professor Jon Reinertsen for discussing topics in econometrics relevant for the analyses in this dissertation. I will also give thanks to the Associate Professors Svein Børre Lyngdal, Anne Bang Lyngdal, Assistant Professor Ådne Stafseth and Ph.D student Ann-Kristin Elstad for inviting me to their enjoyable "lunch meetings". Special thanks should also go to Assistant Professor Kirsten Piltingsrud for sharing some of my frusterations concerning this Ph.D project. I will also give thanks to my colleagues in financial accounting, management accounting, finance and taxation at Buskerud University College: Associate Professors Ove Schjølberg, Dag Øivind Madsen, Odd Birger Hansen, Reidar Hæhre, Knut Bratlie and Assistant Professors Nina Bollum Berge and Hans Richard Thjømøe. You have all supported me during this process. Thanks must also be given to Assistant Professor Eva Tangen for giving feedback on my written English.

Special thanks should also go to Sparebank 1 Ringerike Hadeland, Buskerud University College and Ernst & Young for giving me financial funding for my Ph.D.

Last, but definitely not least, Kathrine, my partner, has been an important listener and motivator during the whole process. She has reminded me that there are other and more important parts of life than this dissertation. I want to dedicate the dissertation to her.

Hønefoss, 22th November 2011

Tonny Stenheim

Summary

This dissertation investigates the decision usefulness of goodwill-accounting numbers. The new impairment-only method under current IFRS is in particular focus. Purchased goodwill shall no longer be amortised over expected economic lifetime, but tested for impairment losses at least annually. This accounting-method change has several implications. The modified historical-cost model is replaced by a model based on fair-value accounting, and the asymmetric accounting treatment of purchased and internally-generated goodwill is to some extent removed. Book goodwill is kept unchanged as long as the book value can be justified by reference to a recoverable amount of the cash-generating unit at which goodwill is allocated. This allows indirect capitalisation of internally-generated goodwill, which might lead to more relevant information. At the same time, accounting for goodwill-impairment losses provides the accounting preparers with a lot of discretionary freedom, which probably leads to more opportunistic reporting. This might impair the reliability of these impairment losses.

An investigation of the decision usefulness of goodwill-accounting numbers should, therefore, emphasise the relevance and the reliability of these numbers. Clear references are made to the conceptual framework of IASB when choosing theoretical foundation and methodological design for this dissertation. Based on the concept of decision usefulness and the primary qualitative characteristics, relevance and reliability, theory and methodology from three lines of literature are employed: value relevance, earnings management and corporate-governance literature. An accounting number is considered value relevant if it has a predicted association with stock prices and/or stock returns. Demonstrated value relevance suggests that the accounting numbers provide relevant, and to some extent,

reliable information. The risk of opportunistic earnings management in accounting numbers might be investigated by testing associations between accounting choices concerning these numbers and variables for economic substance, earnings-management incentives and corporate-governance mechanisms. This will provide some evidence on the reliability of these numbers.

Three alternative accounting methods are investigated: impairment-only method, amortisation-only method and a combined amortisation-and-impairment method. The results suggest that all these three methods provide accounting numbers that are associated with stock prices and stock returns. Book goodwill is positively associated with stock prices, whereas goodwill-impairment losses are negatively associated with stock prices and stock returns, respectively. These results are consistent with predictions. Inconsistent with prediction, however, goodwill-amortisation charges are positively associated with stock prices and stock returns, respectively. The positive association is mainly driven by firms having high performance and/or growth. These results suggest that goodwill-amortisation charges proxy for economic benefits not recognised on the balance sheet. Likely candidates are non-recognised intangible assets embedded in internally-generated goodwill. An investigation of the relative value relevance of goodwill-accounting numbers reported under each accounting method is also conducted. For reasons of completeness, accounting numbers reported under a permanent-retention method are included in this investigation. Differences in adjusted R-squares are tested by performing z-tests with bootstrapped-standard errors and Vuong tests. All methods with amortisation and/or impairment testing provide more value-relevant accounting numbers than the permanent-retention method. The order of preference, however, is less clear when it comes to the other three methods. Indications are found that the method with amortisation and impairment testing is the one that best explains variation in stock prices and stock returns. Still, this method is not necessarily the one to be preferred. Goodwill-amortisation charges do not reflect economic charges. Rather, they seem to proxy for economic value not recognised on the balance sheet. Reporting these as charges in the profit and loss account is inconsistent with faithful reporting.

Value-relevance results provide limited evidence on the reliability of accounting numbers. Lack of reliability and, in particular, verifiability might threaten the decision usefulness of goodwill-impairment losses. Such losses are reported under extensive discretion and might be affected by managers' earnings-management incentives to either understate or overstate net earnings and net-asset values. Two sets of analyses are conducted: An investigation of associations between impairment decisions, size of reported impairment losses and variables for economic impairment and earnings-management incentives, and an investigation of associations between estimates of understated and overstated impairment losses, variables for earnings-management incentives and corporate-governance mechanisms. The first test design is supposed to provide evidence on the extent to which impairment losses are explained by economic impairment and/or earnings-management incentives. If strong predicted associations are demonstrated between reported impairment losses and variables for economic impairment, this is consistent with faithful reporting. In contrast, if strong predicted associations are demonstrated between reported impairment losses and variables for earnings-management incentives after controlling for economic impairment, it suggests that impairment losses reflect earnings-management incentives. Variables for economic impairment are included at three levels of aggregation: macro-economic level, industry-sector level and firm-level. Besides, these variables are formed on market-based, accounting-based and cash-based data. The evidence suggests that impairment decisions and size of reported impairment losses are explained by these variables of economic impairment. Variables reflecting earnings-management incentives, however, are generally insignificantly associated with impairment decisions and size of reported impairment losses. There are, however, some indications that impairment losses might be associated with CFO cash-bonus payments, CFO conditional stocks, smoothing incentives and CEO changes, but these results are relatively weaker than those for variables of economic impairment.

The above test design does not directly address misrepresentation of impairment losses. Earnings-management incentives are believed to be associated with more misrepresentation, whereas corporate-governance mechanisms are believed to be associated with less misrepresentation. Estimates of misrepresentation are obtained from a regression of reported impairment losses on variables for economic impairment. Fitted values from this regression serve as estimates of normal (expected) impairment losses, whereas differences between reported impairment losses and these normal-impairment losses might be interpreted as misrepresentation or abnormal-impairment losses. Some weak evidence is found that firms with CFO cash-bonus payments and firms with CEOs holding more stock options generally understate impairment losses. There is also some weak evidence suggesting that overstated impairment losses are associated with CEO changes. Limited evidence is found that corporate-governance mechanisms are able to constrain misrepresentation in these losses. Some evidence, however, suggests that corporate-governance mechanisms, represented by board characteristics and cross-listing, are associated with overstated impairment losses. This is consistent with stronger corporate governance leading to more conservative accounting and potentially overstated impairment losses.

Impairment testing of goodwill requires high expertise in financial accounting and valuation. Besides, the impairment-testing procedure offers discretionary freedom in most of its facets. No associations between some corporate-governance mechanisms and abnormal-impairment losses could simply be the result of these mechanisms not being efficient to constrain the misrepresentation. An alternative explanation is that these results are influenced by econometrical problems such as measurement errors. Taking all these results together, they support IASB's decision to introduce the impairment-only method. Goodwill-impairment losses provide value-relevant information. No strong results are found that these losses are heavily influenced by earnings management. At the same time, the results indicate that conventional corporate-governance mechanisms are rather inefficient to reduce misrepresentation of these losses. These interpretations are made on the premise that the results are not substantially affected by econometrical problems such as measurement errors.

Sammendrag

Denne avhandlingen undersøker beslutningsnytten til regnskapsmessig goodwill. Avhandlingen fokuserer spesielt på den nye regnskapsmessige løsningen for goodwill under nåværende IFRS. Kjøpt goodwill skal ikke lenger avskrives over forventet økonomisk levetid, men testes minst årlig for nedskrivninger. Denne endringen i regnskapsmessig løsning har flere implikasjoner. Den modifiserte historisk-kost modellen er erstattet med en modell basert på virkelig verdi, og den asymmetriske behandlingen av kjøpt og egenutviklet goodwill er delvis fjernet. Bokført goodwill opprettholdes så lenge den bokførte verdien kan rettferdiggjøres med referanse til et gjenvinnbart beløp beregnet for den kontantgenererende enheten som goodwill tilhører, noe som åpner for indirekte balanseføring av egenutviklet goodwill. Den nye løsningen kan derfor bidra til rapportering av mer relevant informasjon om goodwill. Samtidig har regnskapsprodusentene stor skjønnsmessig frihet når det gjelder rapportering av goodwillnedskrivninger. Dette kan føre til mer opportunistisk regnskapsrapportering og redusert pålitelighet.

En studie av beslutningsnytten til regnskapsmessig goodwill bør derfor fokusere på relevans og pålitelighet. Av den grunn er valg av teoretisk fundament og metodisk tilnærming gjort med klare referanser til IASBs konseptuelle rammeverk. Tre forskningsretninger er valgt: Forskning på verdirelevans, regnskapsmanipulering og corporate governance. En regnskapsstørrelse har verdirelevans hvis den har en forventet assosiasjon med aksjekursen eller aksjeavkastningen. Dokumentert verdirelevans gir derfor en indikasjon på at regnskapsstørrelsene bidrar med relevant og i noe grad pålitelig informasjon. Risikoen for at regnskapsstørrelser er manipulert kan undersøkes ved å teste sammenhengen mellom regnskapsmessige valg for de aktuelle regnskapsstørrelsene og variabler som er ment å reflektere økonomisk substans,

incentiver for manipulering og corporate governance. Et slikt testdesign kan gi indikasjoner på påliteligheten til disse regnskapsstørrelsene.

Tre ulike regnskapsmessige løsninger er undersøkt: en løsning hvor goodwill kun testes for nedskrivninger, en løsning hvor goodwill skal avskrives og en løsning hvor goodwill skal avskrives og testes for verdifall. Resultatene indikerer at alle tre løsningene gir regnskapstall som er assosiert med aksjekursen og aksjeavkastningen. Bokført goodwill er positivt assosiert med aksjekursen, mens goodwillnedskrivninger er negativt assosiert med henholdsvis aksjekursen og aksjeavkastningen. Disse resultatene er i samsvar med prediksjonene. En uventet positiv sammenheng er funnet mellom goodwillavskrivninger og henholdsvis aksjekursen og aksjeavkastningen. Den positive sammenhengen drives i hovedsak av selskaper med høy lønnsomhet og/eller vekst. Disse resultatene indikerer at goodwillavskrivninger reflekterer en ikke-rapportert økonomisk fordel, for eksempel ikke-rapporterte immaterielle eiendeler, som inngår i egenutviklet goodwill.

Det er også foretatt tester av den relative verdirelevansen til goodwill når goodwill er rapportert under ulike regnskapsmessige løsninger. For å gjøre analysen komplett, er også regnskapstall fra en løsning hvor goodwill verken avskrives eller testes for verdifall inkludert. Forskjeller i justert forklaringskraft er testet ved hjelp av z-test hvor standardfeilen er estimert ved hjelp av bootstrapping og Vuong test. Resultatene viser at regnskapsmessige løsninger som krever avskrivninger og/eller testing for verdifall bidrar med mer verdirelevant informasjon enn en løsning som verken tillater avskrivninger eller nedskrivninger. Det er vanskeligere å avgjøre hvilken av de tre andre regnskapsmessige løsningene som bidrar med mest verdirelevant informasjon. Noen svake resultater indikerer at en regnskapsmessig løsning hvor goodwill avskrives og testes for nedskrivninger er den løsningen som best forklarer variasjonen i aksjekursen og aksjeavkastningen. Likevel er ikke dette den regnskapsmessige løsningen som bør foretrekkes. Goodwillavskrivninger ser ikke ut til å reflektere økonomiske kostnader. I stedet er det funnet indikasjoner på at goodwillavskrivninger reflekterer økonomisk verdi som ikke er innregnet på balansen. Resultatføring av disse er ikke i tråd med en troverdig og valid representasjon av økonomisk substans.

Verdirelevansresultater gir begrenset informasjon om påliteligheten til regnskapstall. Mangel på pålitelighet, og i særdeleshet verifiserbarhet, kan true beslutningsnytten til rapporterte goodwillnedskrivninger. Disse nedskrivningene rapporteres under betydelig skjønn og kan være påvirket av ledelsens rapporteringsincentiver for enten å underrapportere eller overrapportere regnskapsmessig resultat og egenkapital. To ulike analyser er utført: En test av sammenhengen mellom nedskrivningsbeslutning, størrelsen på rapportert nedskrivning og variabler for økonomisk verdifall og rapporteringsincentiver, og en test av sammenhengen mellom estimater for under- eller overrapporterte nedskrivninger, variabler for rapporteringsincentiver og corporate governance. Det første testdesignet er ment å undersøke i hvilken grad rapporterte nedskrivninger er forklart av økonomisk verdifall og/eller rapporteringsincentiver. Hvis man finner sterke, predikerte sammenhenger mellom rapporterte nedskrivninger og variabler for økonomisk verdifall, vil dette støtte opp under den antagelsen at disse nedskrivningene gir en troverdig representasjon av økonomisk verdifall. I motsatt fall, hvis sterke, predikerte sammenhenger er funnet mellom rapporterte nedskrivninger og variabler for rapporteringsincentiver etter at det er foretatt kontroll for økonomisk verdifall, indikerer dette at nedskrivningene reflekterer rapporteringsincentiver. Variabler som er ment å reflektere økonomisk verdifall er inkludert fra tre ulike nivåer: makroøkonomisk nivå, bransjesektornivå og selskapsnivå. Variablene er enten markedsbaserte, regnskapsbaserte eller kontantstrømbaserte. Resultatene tilsier at nedskrivningsbeslutningen og størrelsen på nedskrivningen kan forklares ved hjelp av variabler som reflekterer økonomisk verdifall. Variabler som reflekterer rapporteringsincentiver er som regel verken assosiert med nedskrivningsbeslutningen eller størrelsen på den rapporterte nedskrivningen. Det er riktignok noen indikasjoner på at nedskrivninger kan være assosiert med bonusutbetalinger til CFO, betingede aksjer som eies av CFO, incentiver for resultatutjevning eller skifte av CEO, men disse resultatene er relativt svake sammenlignet med resultatene for økonomisk verdifall.

Dette testdesignet har ikke direkte fokus på regnskapsmessig støy i nedskrivninger. Rapporteringsincentiver er forventet å føre til mer regnskapsmessig støy, mens corporate governance er forventet å redusere regnskapsmessig støy. Estimater på regnskapsmessig støy er fremskaffet ved å kjøre en regresjon med rapporterte nedskrivninger som avhengig variabel og variabler for økonomisk verdifall som uavhengige variabler. Estimerte verdier fra denne regresjonen representerer normale (forventede) nedskrivninger, mens forskjellen mellom rapporterte nedskrivninger og disse normale nedskrivningene kan tolkes som regnskapsmessig støy eller abnormale nedskrivninger. Resultatene indikerer at selskaper med høye bonusutbetalinger til CFO eller selskaper som har en CEO som eier mye ansattopsjoner, underrapporterer goodwillnedskrivninger. Det er også funnet resultater som indikerer at overrapporterte nedskrivninger er assosiert med skifte av CEO. Det er funnet begrenset støtte for at corporate governance reduserer regnskapsmessig støy i disse nedskrivningene. Noe støtte er derimot funnet for at corporate governance, representert ved kjennetegn ved styret eller ved kryssnotering, er assosiert med overrapporterte nedskrivninger. Dette kan tyde på at sterkere corporate governance fører til mer forsiktig regnskapsrapportering og dermed overrapportering av goodwillnedskrivninger. Testing av verdifall i goodwill krever solid regnskapsfaglig kompetanse og solid verdsettingskompetanse. Dessuten er det stort innslag av skjønn i de fleste trinnene i en slik nedskrivningstest. Grunnen til at man ikke finner noen sammenheng mellom flere av corporate governance-variablene og regnskapsmessig støy kan derfor ganske enkelt være at disse kontrollmekanismene ikke er effektive nok til å redusere regnskapsmessig støy ved rapportering av goodwillnedskrivninger. En annen forklaring kan være at resultatene er påvirket av økonometriske problemer slik som målefeil.

Samlet sett gir resultatene i denne avhandlingen støtte for IASBs valg av regnskapsmessig løsning for goodwill. Goodwillnedskrivningene bidrar med verdirelevant informasjon. Resultatene tyder også på at nedskrivningene i liten grad kan forklares med incentiver for regnskapsmanipulering. Samtidig indikerer resultatene at tradisjonelle corporate-governance- mekanismer i liten grad evner å redusere regnskapsmessig støy i nedskrivningene. Disse tolkningene bygger på den forutsetningen at resultatene i liten grad er drevet av økonometriske problemer slik som målefeil.

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1. Motivation and research questions

This dissertation investigates the decision usefulness of goodwill-accounting numbers under current IFRS. Theory and methodology from value relevance, earnings management and corporate-governance literature are employed. The dissertation compares the value relevance of goodwill numbers reported under the impairment-only method of current IFRS (International Financial Reporting Standards) to the value relevance of goodwill numbers reported under alternative accounting methods. The dissertation also investigates the extent to which goodwill-impairment losses under IFRS are associated with variables for economic impairment, earnings-management incentives and corporate-governance mechanisms. The findings of this dissertation are supposed to inform standard setters, accounting prepares and accounting users on the decision usefulness of goodwill under current IFRS.

1.1. Introduction and background

Accounting for goodwill is one of the most controversial issues in financial-accounting theory and standard setting. Generations of accounting academics and standard setters have struggled with the challenge of developing a theoretically consistent accounting treatment of goodwill (Hudges 1982). In the quest to promulgate high-quality accounting standards that generate relevant and reliable information for decision-making, the US-standard setter, FASB (Financial Accounting Standards Board), and the international standard setter, IASB (International Accounting Standards Board), have implemented a substantial change in the reporting policy of goodwill. First, the new regulation requires firms to perform an annual impairment test for goodwill, and second, amortisation of goodwill is no longer permitted. Three factors are believed to affect the decision usefulness of accounting information for a given accounting method: the extent to which the information reflects economic fundamentals, the measurement uncertainty and the risk of opportunistic earnings management (Wilson 1996, Healy and Wahlen 2001). All these factors will influence the relevance and reliability of the accounting information and thereby its decision usefulness. Accounting information that fails to reflect economic fundamentals will lack relevance and reliability. Information reported under significant measurement uncertainty will lack reliability and to some extent relevance, and finally, accounting information reported under risk of opportunistic earnings management will probably lack both relevance and reliability. The discussion about goodwill-accounting methods will strongly involve all three factors.

Both purchased and internally-generated goodwill represent economic resources and will most likely have limited economic life. This suggests that both should be capitalised on the balance sheet and amortised over expected economic lifetime. Instead, purchased goodwill is capitalised and tested at least annually for impairment losses, and internally-generated goodwill is charged against the profit and loss account. Surprisingly, the chosen accounting methods for goodwill do not seem to reflect economic fundamentals in goodwill. The reason for these chosen methods is measurement problems. Internally-generated goodwill cannot be reliably measured at cost. Purchased goodwill, however, has a reliable cost price, but subsequent amortisation involves significant measurement uncertainty. FASB and IASB argue that the pattern and the length over which purchased goodwill is consumed are impossible to determine with sufficient reliability. They claim that the amount amortised for goodwill in any given period is at best an arbitrary estimate of the consumption of goodwill for that period, which suggests that the amortisation lacks relevance and reliability (e.g. IASB 2004b:IAS 36 BC 134-5). This argument is not fully valid. Some guidance on the estimation of amortisation charges might be found. Purchased goodwill, as all other assets, represents expected future benefits. On acquiring these benefits, the managers will have expectations as to the period and the pattern over which these benefits are to be received, which is useful information when determining the amortisation plan.

The impairment-only method does not distinguish remaining purchased goodwill from internally-generated goodwill. As long as purchased and internally-generated goodwill can justify book goodwill, no impairment loss is recognised. This may lead to indirect capitalisation of internally-generated goodwill and a removal of some of the accounting asymmetry between purchased and internally-generated goodwill. This suggests a more faithful representation of total goodwill and improved decision usefulness. On the other hand, significant measurement uncertainty and the risk of opportunistic earnings management may impair decision usefulness.

The impairment test is conducted on cash-generating units at which goodwill is allocated. If recoverable amounts are below carrying amounts of these units, impairment losses must be reported. Allocation of goodwill to cash-generating units and estimation of recoverable amounts of these units, however, involve significant uncertainty and discretionary freedom, which in turn gives room for opportunistic earnings management. It is an empirical question whether the impairment-only method provides more decision-useful information than other methods such as capitalisation and amortisation. The amortisation method may provide less relevant information at least for valuation purposes. At the same time this method provides more reliable information due to its higher degree of verifiability. The impairment-only method, however, may provide more relevant information, but information that is less verifiable and at a higher risk of being opportunistically managed.

1.2. Research questions

Three lines of literature are believed to provide evidence on the decision usefulness of accounting information: the value relevance and information-content literature, the earnings-management literature and the literature investigating the link between corporate-governance and earnings management. The first line of literature is supposed to provide evidence on the usefulness of accounting for equity valuation. Value-relevance studies test the extent to which accounting numbers are *associated* with stock prices. A demonstrated association is interpreted as accounting numbers capturing information in stock prices. Short-term information content studies (short-term event studies), however, are supposed to test the extent to which accounting numbers *affect* stock prices. Earnings-management studies represent the second line of literature. These studies are investigating how earnings management can be detected in earnings and accrual patterns, which conditions and factors that increase the risk of earnings management and what impact earnings management have on accounting information and the decisions made upon accounting information. In contrast to the first line of literature, earnings-management studies are not basically motivated by questions regarding decision usefulness. It is expected, however, that opportunistic earnings management will impair decision usefulness as the results of such opportunism typically are misleading and/or fraudulent accounting. This suggests that evidence of opportunistic earnings management may serve as evidence of impaired decision usefulness. The third line of literature demonstrates that corporate-governance mechanisms can constrain managers' opportunism and restrict their ability to engage in opportunistic earnings management. Opportunism and agency costs will diminish under efficient monitoring and contracting. An efficient corporate-governance structure can, therefore, be indicative of less opportunistic earnings management and more decision-useful accounting information.

Several studies examine the value relevance of book goodwill and goodwill-amortisation charges, and some studies investigate the value relevance and information content of goodwill-impairment losses. In general, book goodwill is found to be value relevant. This evidence is consistent across numerous studies which employ different samples and methodological designs (e.g. Wang 1993, Amir, Harris and Venuti 1993, Chauvin and Hirschey 1994, Jennings, Robinson, Thompson II and Duvall 1996, Huijgen 1996, Barth and Clinch 1996, Vincent 1997, Wilkins, Swanson and Loudder 1998, Henning, Lewis and Shaw 2000, Petersen 2001, 2002, Bugeja and Gallery 2006, Jifri and Citron 2010). The value-relevance findings of goodwill-amortisation charges are less consistent (e.g. Jennings et al. 1996a, Huijgen 1996, Petersen 2001, 2002). Jennings et al. (1996a) report weak evidence, suggesting that goodwill-amortisation charges are value relevant. In contrast, Jennings, LeClere and Thompson II (2001) find that earnings before goodwill amortisation are more value relevant than earnings after goodwill amortisation. They interpret these results as evidence of goodwill amortisation introducing noise rather than adding useful information to earnings. Henning et al. (2000) employ a somewhat different methodological design. They examine the value relevance of components of goodwill and goodwill-amortisation charges and report evidence suggesting that at least some components of goodwill amortisation have value relevance.

Impairment losses and goodwill-impairment losses, in particular, are supposed to suffer from significant measurement uncertainty, lack of verifiability and the risk of being managed (e.g. Elliot and Shaw 1988, Francis, Hanna and Vincent 1996, Alcatore, Dee, Easton and Spear 1998, Riedl 2004, Kvaal 2005, Beatty and Weber 2006, Lapointe-Antunes, Cormier and Magnan 2008, Ramanna 2008, Zang 2008, Ramanna and Watts 2009, Kothari, Ramanna and Skinner 2010). Although significant effort is made to tighten the test procedure for goodwill, the discretionary freedom is still significant. Francis et al. (1996) provide evidence, using pre-SFAS 121 data (Statement of Financial Accounting Standards 121), which supports the notion that impairment losses are associated with economic impairment and to some extent earnings-management incentives. They demonstrate evidence suggesting that earnings-management incentives play a minor role when reporting impairment losses in inventory and property, plant and equipment, but play a substantial role when reporting other, more discretionary impairment losses, such as losses in goodwill. Recent evidence reported by Beatty and Weber (2006), Zang (2008) and Ramanna and Watts (2009) suggests that even SFAS 142-impairment losses in goodwill are associated with managers' reporting incentives. These results question the claim made by the standard setters that the impairment-only method improves the decision usefulness of goodwill compared to the previous amortisation method. Rather, these results are in line with several commentators arguing that goodwill-impairment losses require significantly greater judgement, which cannot be verified by auditors (Lewis, Lippitt and Mastracchio 2001, Massoud and Raiborn 2003, Watts 2003, Ramanna 2008, Ramanna and Watts 2009). Watts (2003), Ramanna (2008) and Ramanna and Watts (2009) argue that reporting unverifiable estimates such as fair-value estimates will seriously compromise the usefulness of those numbers and increase the likelihood of opportunistic earnings management. Kothari et al. (2010) even argue that this method will be short-lived and will probably be replaced by the former amortisation method. Others, like Barth (2006), claim that fair-value accounting will lead to reporting of asset values, which reflects current economic conditions and up-to-date expectations suggesting increased decision usefulness.

Opportunistic earnings management is expected to be constrained by efficient corporate-governance mechanisms. Prior literature demonstrates evidence that firms with stronger corporate-governance structures are less likely to engage in earnings management (e.g. Warfield, Wild and Wild 1995, Dechow, Sloan and Sweeney 1996, Beasley 1996, Chtourou, Bedard and Courteau 2001, Klein 2002, Koh 2003, Xie, Davidson and DaDalt 2003, Peasnell, Pope and Young 2005, Mulgrew and Forker 2006, Ebrahim 2007). A similar line of literature demonstrates that efficient corporate governance improves the information content of earnings (e.g. Warfield et al. 1995, Anderson, Deli and Gillan 2004) and improves earnings and accrual quality (Doyle, Ge and McVay 2007, Kent, Routledge and Stewart 2010). Managers disciplined by efficient corporate-governance structures are likely to avoid opportunism and instead use their accounting discretion to convey faithful information. This suggests reporting impairment losses that better reflect economic fundamentals. Alternatively, given strong earnings-management incentives and weak corporate-governance structures, managers may exploit the accounting discretion to report impairment losses. Most of the research conducted on earnings management and corporate governance has employed abnormal-accrual models to indicate earnings management (e.g. Warfield et al. 1995, Chtourou et al. 2001, Klein 2002, Koh 2003, Xie et al. 2003, Peasnell et al. 2005, Mulgrew and Forker 2006, Ebrahim 2007). These abnormal-accrual models have been strongly criticised for being too crude and aggregate to reveal earnings management (e.g. Dechow et al. 1995, Guay, Kothari and Watts 1996, McNichols 2000, Field, Lys and Vincent 2001). However, the idea of estimating the portion of accruals that might be managed or misrepresented still has some appeal among accounting researchers (e.g. Peasnell et al. 2005, Davidson, Godwin-Stewart and Kent 2005, Mulgrew and Forker 2006, Ebrahim 2007, Koh, LaPlante and Tong 2007, Jones, Krishnan and Melendrez 2008). The problem lies in the estimation of the portion being managed or the portion being misrepresented. A related problem is the aggregate level at which the abnormal accruals are estimated. As these accruals represent net aggregate accruals, they may not depict managed accruals at a disaggregated level such as impairment losses. Inspired by previous earnings-management studies and by contributions in the asset-impairment literature (Lapointe-Antunes et al. 2008, Zang 2008), a measure of abnormal-impairment losses is employed to indicate the degree of misrepresentation in goodwill-impairment losses. In contrast to earlier measures used in the literature, this measure is derived for a specific accrual: impairment losses. This is consistent with Healy and Wahlen (1999), McNichols (2000) and Field et al. (2001) who argue that future earnings-management studies should rely on disaggregated accrual measures. Moreover, economic impairment in goodwill will probably be highly associated with economic variables reflecting deteriorated firm performance, industry performance and macro-economic performance. This suggests that these variables can be used to determine whether reported impairment losses are understated, overstated or unbiased depictions of economic impairment. Differences between reported impairment losses and estimated economic impairment are considered as unexpected or abnormal-impairment losses.

An investigation of the decision usefulness of goodwill numbers under current IFRS should involve questions regarding the value relevance of goodwill numbers and the risk of goodwill-impairment losses being opportunistically managed. The risk is a function of information asymmetry, discretionary freedom and managers' expected benefits over costs of managing earnings. Efficient corporate-governance structures are supposed to reduce the expected net benefits of earnings management by aligning conflicting interests and by monitoring managers' actions. An investigation of the decision usefulness should, therefore, include corporate-governance mechanisms as potential limiting factors of earnings management.

Taken together, prior literature provides limited or no answers to questions regarding the decision usefulness of goodwill under IFRS. No prior study, at least to my knowledge, has investigated the value relevance of alternative accounting methods for goodwill using IFRS data. Some evidence is reported on US-GAAP data, but this evidence cannot be fully converted to IFRS due to a different impairment-test procedure. Moreover, scarce evidence is reported on the associations between goodwill-impairment losses and variables for economic impairment and earnings-management incentives using IFRS data. And finally, no prior study, at least to my knowledge, has investigated how corporate-governance mechanisms influence the accounting for goodwill-impairment losses. This leads to the following research questions:

Table 1.1 Research questions

Research question 1

What is the value relevance of goodwill numbers reported under current IFRS?

Research question 2

What is the value relevance of goodwill numbers reported under current IFRS compared to the value relevance of goodwill numbers under alternative accounting methods?

Research question 3

What are the associations between goodwill-impairment losses reported under current IFRS and variables for economic impairment and earnings-management incentives?

Research question 4

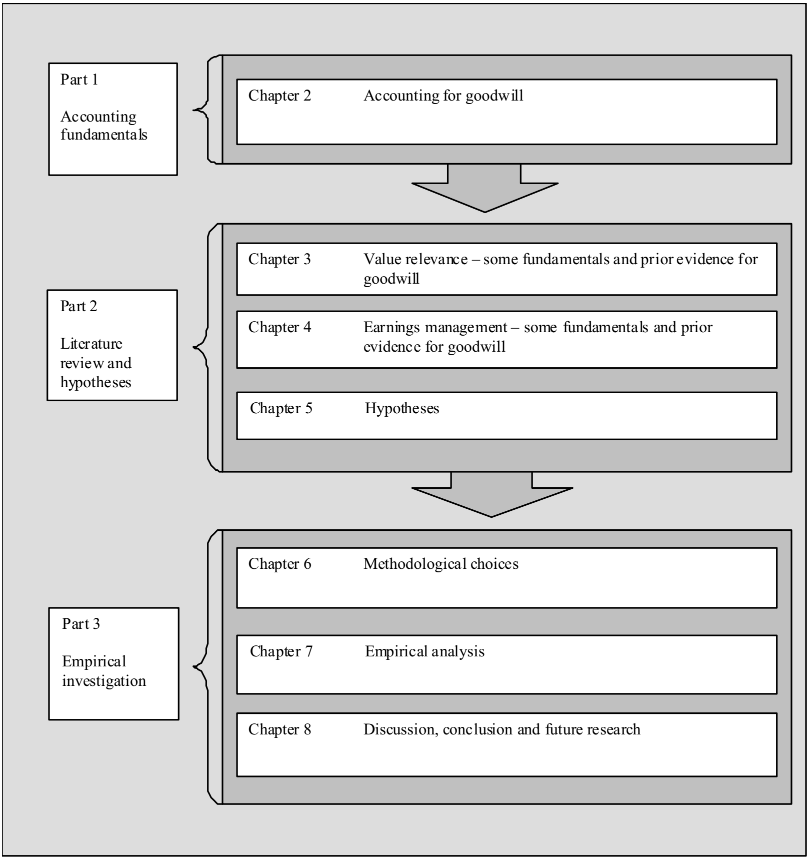
What are the associations between abnormal-impairment losses in goodwill reported under current IFRS, variables for earnings-management incentives and corporate-governance mechanisms?

These research questions are supposed to provide evidence relevant for financial-accounting standard setters, preparers and users on the decision usefulness of goodwill numbers. The answers to these research questions might be useful to standard setters when they evaluate prior policy decisions and make new policy decisions regarding goodwill. Accounting preparers and accounting users might find the answers useful to easier understand what mechanisms that affect the decision usefulness of goodwill numbers. And finally, the answers might also help accounting users detecting goodwill numbers (e.g. goodwill-impairment losses) of high and low quality. The research questions are investigated for a sample of 1293 firm-year observations of firms listed on the London Stock Exchange in the period 2004 to 2009. The core investigation period is the post-IFRS period 2005 to 2009. This period includes 1122 firm-year observations.

1.3. Structure

The dissertation proceeds as delineated in Figure 1.1 below.

Figure 1.1 Structure of the dissertation



2. Accounting for goodwill

Goodwill is the focal concept of this dissertation. The nature of goodwill and the discussion of alternative accounting methods for goodwill represent a background for discussing the current impairment-only method. The first part of the chapter concerns the nature and conceptual meaning of goodwill, while the second part concerns initial and subsequent accounting for goodwill. The chapter ends with a discussion of the impairment-only method.

2.1. Nature of goodwill

Goodwill has certain characteristics that distinguish it from other economic resources (Guthire 1898, Hugdes 1982). Goodwill has no physical substance. It is not possible to address economic benefits of goodwill to a physical object. For instance, the economic benefits of a piece of land can be addressed to the right to occupy and utilise a defined portion of terrain. Lack of physical representation, however, is a characteristic that goodwill has in common with other intangible assets like brand names and patents and assets not considered as intangibles in accounting such as stocks, receivables and deferred tax assets. Still, goodwill is supposed to be the *most intangible* of the intangibles (Davis 1992). It is difficult to determine what constitutes goodwill or which economic benefits are embedded in goodwill. The recognition criteria for intangible assets ensure that goodwill, either purchased or internally generated, consists of intangible resources that are most difficult to identify and measure separately (Høegh-Krohn and Knivsflå 2000). Purchased goodwill is measured as the portion of the cost price (or the purchase price) that cannot be allocated to identifiable net assets in the acquired firm. Internally-generated goodwill, on the other hand, will consist of intangible resources that do not meet recognition criteria of capitalisation. Consequently, both purchased and internally-generated goodwill consist of the portion of intangibles that do not meet the criteria for separate recognition on the balance sheet which makes goodwill the *most intangible asset*.

An intangible nature, however, does not imply that goodwill should be an accounting challenge. Other characteristics are more important. Goodwill lacks transferability. It is attributed to the cash-generating capacity of all the assets in the firm, or more specifically, assets within cash-generating units to which goodwill is attributed. A separate transfer of goodwill is, therefore, not possible (Catlett and Olson 1968:12[1], Kothari, Ramanna and Skinner 2010). As stated by Hugdes (1982:187): *"The problems associated with its [goodwill's] transferability and realization might be compared with an attempt to sell the speed of a racehorse apart from the animal itself."* Other characteristics also distinguish goodwill from tangible and most intangible assets. Goodwill is believed to have no alternative use and thus, no opportunity cost (Hendriksen and van Breda 1992:635-636, Lev 2001:22-26, Elling 2001:190, Kothari et al. 2010). Tangible and most intangible assets have different values in alternative uses. They are rival assets in the sense that different uses compete for the services of these assets. A specific use precludes the assets from simultaneously being used elsewhere. In contrast, goodwill and some other intangible assets are believed to be nonrival. They can be used at the same time for multiple purposes where a given use does not compete with the use elsewhere. For instance, good reputation of the firm's products is often seen as part of goodwill unless it can be attributed to a brand name that meets the recognition criteria. Good reputation does not have any competing alternative use. This means that using good reputation as a catalyser when promoting new products will not diminish the benefits of the reputation. It is

[1] References to books, booklets, dissertations and theses are given with page number.

only enclosed by the potential size of the market and the actions of potential competitors, not by its own use (Lev 2001:22).

The measurement problems of goodwill have several sources. As stated previously, goodwill cannot be transferred separately. It is not possible to find an observable market price for goodwill and separate cash flows cannot be attributed to goodwill alone. Besides, intangible assets embedded in goodwill are difficult to identify and even more difficult to value (Grinyer, Russel and Walker 1990:108, Wyatt 2008, Kothari et al. 2010). Taken together, goodwill has some distinctive characteristics. Goodwill has no alternative use, it lacks separability, it is difficult to determine whether initially recognised goodwill is maintained, and finally, future benefits from goodwill are highly uncertain (Høegh-Krohn and Knivsflå 2000). This makes goodwill the ultimate challenge in accounting (Hendriksen and van Breda 1992: 637).

2.2. Definition of goodwill

An important part of the goodwill discussion deals with its definition. A number of definitions are suggested, but each definition suffers from several flaws. First, most of the definitions truly do not deserve to be referred to as definitions. They are measurement procedures only. They do not describe in rigorous terms what constitutes goodwill. Rather, they are attempts to assign monetary value to goodwill. Second, some definitions try to constitute what goodwill is, but they fail because they do not provide clear demarcation between goodwill and other economic resources.

2.2.1.Residual approach and abnormal-return approach

Goodwill is a wellknown item in trade and industry, but very few can give a proper description of what goodwill really is. Its meaning is obscure, and the nature of the term is often misunderstood (Petersen 2001:14). The accounting literature generally defines goodwill as residual goodwill or as abnormal-return goodwill. Residual goodwill is frequently termed *the master valuation amount* (e.g. Canning 1929:41-2, Falk and Gordon 1977, Hendriksen and van Breda 1992:641-2), and abnormal-return goodwill is frequently termed *excess profits* or *super profits* (e.g. Bloom 2008:74).

The residual approach identifies goodwill as a positive difference between the firm's cost price or purchase price and the fair values of the firm's identifiable net assets. A variant of this definition is found in most financial-accounting regimes. Only goodwill recognised as part of a business combination is captured by the residual approach. Internally-generated goodwill is ignored. Still, internally-generated goodwill might be recognised as part of purchased goodwill in a business combination, but when the business combination is settled, this goodwill is literally purchased rather than internally generated. The abnormal-return approach, however, derives a cash-generating capacity concept that does not distinguish internally-generated goodwill from purchased goodwill. This approach measures goodwill as the present value of expected abnormal returns in excess of required rate of returns (e.g. More 1891, Dicksee 1897, Leake 1914, Catlett and Olson 1968, Falk and Gordon 1977, Colley and Volkan 1988, Blanchet and Tweedie 1989, Davis 1992). Abnormal returns are generated by internally developed as well as purchased assets. The fact that this approach does not distinguish internally-generated goodwill from purchased goodwill might be seen a strength.

However, this is not correct. The abnormal-return approach does not separate any economic assets from goodwill neither (other) intangible nor tangible assets. All assets may jointly contribute to abnormal returns (Ma and Hopkins 1988, Arnold, Egginton, Kirkham, Macve and Peasnell 1992:36, Petersen 2001:14). It is, therefore, difficult if not impossible to separate abnormal returns generated by residual goodwill from abnormal returns generated by other assets. Hendriksen and van Breda (1992:641) argue that the notion that *"(...) tangible assets can earn only a "normal" rate while other factors are responsible for the excess rate is pure fiction. (...) All factors interact in the production of the final service or product and in permitting cash distributions to shareholders. Any attempt to allocate a portion of the total value of a firm on the basis of the capitalisation of superior earnings is, therefore, completely artificial."* Watts (2003) supports this argument and states that the allocation of cash flows is arbitrary, meaningless and unverifiable. Still, it seems reasonable to believe that abnormal returns, at least to some extent, are generated by intangible assets. Such assets might represent benefits from a dynamic organisation and/or superior knowledge and skills held by managers and employees. There are also examples from the literature that residual goodwill is considered equal to abnormal-return goodwill. For instance, Jennings, LeClere and Thompson II (2001:20) state that goodwill measured as *"(...) the difference between the value of a company's ownership interest and the fair value of its identifiable net assets represents comparative advantages that are expected to enable the company to generate earnings in excess to a 'normal' return on investment."* According to this interpretation, residual goodwill is the purchase price of expected abnormal returns.

Other definitions of goodwill are also suggested. Most of these can be considered as definitions of residual goodwill and/or abnormal-return goodwill. For instance, goodwill is sometimes referred to as *the custom of a trade*. According to this view, goodwill is a collection of favourable attributes enjoyed by an enterprise which have arisen from the productive use of its resources (Wines and Ferguson 1993). These favourable attributes will probably be captured by residual goodwill as well as abnormal-return goodwill. Hugdes (1972:7-8) describes goodwill in terms of *"(...) the different ability of one business, in comparison with an assumed averaged firm, to make profit."* The abnormal-return approach is easily found in this definition. The profit made by the average firm is an estimate of the required rate of return. Any profit in excess of this rate of return is interpreted as evidence of goodwill. Moreover, Catlett and Olson (1968:10) and Davis (1992) consider goodwill to be everything that might contribute to the advantages an established firm possesses over a firm just started. These advantages could, for instance, be a result of well-established market position and superior knowledge about market forces. Both well-established market position and superior knowledge will probably be part of residual goodwill, and it is likely that these advantages will be sources of abnormal return and thereby part of abnormal-return goodwill.

Colley and Volkan (1988), however, employ a different approach to define goodwill. The focus here is on competitive advantages in general, not necessarily the comparative advantages an established firm holds relative to a newly started firm: *"(...) a firm may decide to acquire the net assets of another in order to add certain production capabilities to its existing product lines. An alternative would have been to develop these products internally. If the firm can estimate the dollar amounts of the expenditures over the time period necessary to develop these production and sale capabilities, and the income lost due to waiting for the sales to start, then the amount of goodwill paid will, ideally, be equal to the difference between the present value of these amounts computed using the project time* *horizon, (...), and the anticipated return on the market value of the identifiable net assets of the acquired firm"* (Colley and Volkan (1988:35). This demonstrates a residual approach to define goodwill. The present value of the expenditures necessary to develop the same production and sale capabilities will equal the purchase price of a firm holding these capabilities, and the present value of the anticipated return on the market value of the identifiable net assets will equal the fair value of the identifiable net assets. Goodwill is measured as the difference between these two amounts which corresponds to residual goodwill.

2.2.2.List-based approach

Davis (1992) argues that the conventional ways to define and measure goodwill cannot serve as definitions. The residual and the abnormal-return approach only assign monetary value to goodwill. They do not explain what goodwill is. This has motivated researchers to find alternative ways to define and describe goodwill. Johnson and Petrone (1988) distinguish between two alternative approaches for defining goodwill: a bottom-up approach and a top-down approach. The first approach sees goodwill as part of a larger asset, i.e. the cash-generating unit or the firm itself. The definition of goodwill found in financial accounting is consistent with a top-down approach. According to the bottom-up approach, goodwill is constituted by the intangible resources that sum goodwill up. Several attempts have been made to define goodwill in a bottom-up approach or a list-based approach (e.g. Nelson 1953, Colley and Volkan 1988, Davis 1992). The purpose has been to end up with a definition or at least a description of what constitutes goodwill rather than just a measurement procedure for goodwill. However, none of these attempts have succeeded. The set of intangible assets that constitutes goodwill is not given. Even if, a list of intangibles might give some description of what constitutes goodwill, this approach suffers from several flaws. First, the list-based approach lacks accuracy and demarcation. An obvious problem lies in the language itself. By decomposing goodwill into intangibles, the list of terms reflecting potential intangibles embedded in goodwill could be almost infinite without giving any accurate description of what goodwill is. Besides, it does not provide any clear demarcation between intangibles to be embedded in goodwill and intangibles to be separated from goodwill. By referring to the review article of Davis (1992), the objections above are easily demonstrated. Davis (1992) discusses list-based definitions suggested in prior studies. First, the list-based definitions mix sources of goodwill with the effects of goodwill being present. For instance, licences and franchises included in some of the list-based definitions may explain the presence of goodwill. Superior earnings power also included represents the effect of goodwill being present. Second, several of the items included in the list-based definitions are interrelated to one another or overlapping, suggesting that they are included because of lack of linguistic accuracy and not the fact that they are individual factors creating goodwill. For instance, there is obviously a relation between managerial talent and the managers' ability to discover talents and favourable resources. Both are included in the same list-based definition. Moreover, it is impossible to distinguish favourable governmental relations from good governmental relations.

Third, some of the items are truly identifiable assets that will meet the accounting criteria of separate recognition on the balance sheet. For instance, purchased patents, purchased copyrights and purchased brand names are all identifiable intangible assets. This stresses the need for clear demarcation. And finally, as emphasised by Colley and Volkan (1988:37) *"(...) the characteristics must not only be identified, but also assigned meaningful dollar values."* But as stated previously, it is difficult or even impossible to individually measure each intangible asset embedded in goodwill. In business combination where goodwill only consists of one or two intangible assets, this may be feasible. However, in most cases, goodwill consists of a multitude of intangibles. Not being able to assign values to these intangibles, undermine the usefulness of this list-based approach even more. As stated by Hugdes (1982:175): *"More than a century has passed since the first accounting article on goodwill appeared, and in that time goodwill has been defined in literally hundreds of ways. In fact the most striking feature of this literature is not that most of the definitions are similar, but that many of them are different and most cases (...) even conflicting."* Thus, a proper goodwill definition remains still to be found (Bloom 2008:73). Goodwill is at best considered as a monetary quantum measured as the residual in a business combination or as the present value of abnormal returns. Other approaches only lead to endless lists of intangibles that are supposed to sum goodwill up. In this dissertation, goodwill is considered a residual consisting of comparative advantages that may give rise to abnormal returns. This interpretation is consistent with the residual approach found in financial accounting. At the same time, it emphasises that goodwill may give rise to abnormal-return opportunities.

2.3. Accounting recognition of goodwill

Recognition and measurement are crucial elements of financial accounting. By recognition is meant the determination of when and how particular items enter the accounting records of an entity (Liang 2001). The significance of recognition is clearly demonstrated for goodwill as purchased goodwill is recognised on the balance sheet and internally-generated goodwill is not. The reason for this asymmetric treatment is mainly found in the measurement problems of internally-generated goodwill and thereby the lack of meeting the recognition criteria for capitalisation. This subchapter will discuss both "types" of goodwill: purchased goodwill and internally-generated goodwill.

Two different orientations exist for recognition of earnings and balance sheet items: the balance orientation and the income orientation. Balance orientation has been termed the *asset-liability view* or the *balance-sheet approach* and income orientation has been termed the *revenue-expense view* and *income statement approach* (FASB 1976:103-9, Kvifte 2003:94). Under balance orientation, goodwill must meet the definition of an asset to be reported on the balance sheet. This makes definitions of assets, liabilities and equity fundamental for accounting recognition (Elling 2001:115-6, Kvifte 2003:94). Meeting the asset definition, however, is not sufficient for recognition on the balance sheet. The asset or liability must also be reliably measured (IASB 1989: paragraph 83). According to the income-orientation approach, revenue recognition and matching are of most importance (Kvifte 2003:94, Dichev 2008). This means that any capitalisation of goodwill under this orientation must be justified by the need of future matching.

Balance orientation and income orientation have typically been addressed to certain objectives of financial accounting. Emphasis on the balance sheet is thought to provide information more useful for investment valuation, whereas emphasis on the profit and loss account is thought to provide information more useful for stewardship purposes (Davis, Paterson and Wilson 1997). This is partly explained by the fact that both orientations are linked to certain measurement attributes. Fair value is attributed to balance orientation and historical cost to income orientation. Kvifte (2003:123) argues that there is no direct link between these two orientations of financial accounting and a certain favouritism of measurement attributes: *"(...) the conflict between the A-L [Asset-Liability] and* *the R-E [Revenue-Expenses] view is not necessarily a disagreement primarily concerning measurement attributes. It is not true that particular measurement attributes goes hand in hand with one of the two views."* This reduces the potential conflict between the balance orientation and the income orientation to the role the definitions play for accounting recognition: *"In the A-L view assets and liabilities are economic resources and obligations. Economic resources and obligations will typically be included in the balance sheet in an R-E view as assets and liabilities as well. However, in addition the balance sheet will include certain accruals (accrued costs and revenues) and deferrals (deferred costs and revenues) that are not economic resources and obligations"* (Kvifte 2003:126). Thus, it is not obvious that the fundamental approach of accounting makes any difference when it comes to the initial recognition of goodwill. Arnold and Kirkham (1992) support this view. They argue that the matching principle, fundamental to the income orientation, will make it necessary to capitalise goodwill to ascertain a proper match between future revenues and charges. Moreover, the expectation of future benefits suggests the presence of an asset, and thus, capitalisation under the balance orientation.

The following sections will focus on the recognition criteria under the balance orientation. There are several reasons for this choice. There is little doubt that balance orientation is the one preferred in financial accounting. The fact that the leading standard setters throughout the world are manifesting this approach in their conceptual frameworks strongly supports this choice. Some, however, argue that the balance orientation should be challenged and reconsidered. For instance, Dichev (2008) argues that this orientation is flawed. It does not reflect the essential features of the business model which is to generate earnings. He also claims that more focus on assets and liabilities and fair value as the preferred measurement attribute will destroy the forward-looking ability of earnings. Moreover, Kvifte (2003, 2008) refers to several examples from standard setting, where the balance-oriented conceptual framework has been ineffective in solving standard-setting problems. Nevertheless, the new accounting regulation for goodwill, the impairment-only method, is developed with references to the balance-oriented conceptual framework (e.g. IASB 2004d), which makes an examination of the recognition criteria within this framework most relevant for this dissertation. The first criterion is whether goodwill meets the definition of an asset which is in focus in the following sections.

2.3.1. Goodwill – an asset

The goodwill-asset discussion culminated in the US at the end of the 1960s. Two decades later the asset question was high on the standard setters' agenda in the UK. In both cases the discussion was motivated by accounting-policy choices for goodwill.

2.3.1.1. Asset definition – some general criticism

The asset definitions of the leading standard setters, FASB, IASB and ASB (Accounting Standards Board), are almost identical (FASB 1985:6.25, IASB 1989:53-9, ASB 1999:4.6). For instance, FASB defines assets as *"(...) probable economic benefits obtained and controlled by a particular entity as a result of past transactions or events."* According to this definition, an asset has three fundamental characteristics. Assets must represent a potential for future economic benefits, be controlled by the entity and be confirmed by past transactions or events.

The fundamentals of an asset is the present right or access to some economic benefits. There might be uncertainty regarding these benefits, but the fact that uncertainty exists does not preclude the benefits from constituting an asset. The term *probable* or *expected*, used by FASB and IASB, reflects this uncertainty. The degree of uncertainty will affect the valuation of the asset, not the classification as an asset. In extreme cases, however, the uncertainty may affect the answer to the asset question, but only if the uncertainty drives the expected benefits down to zero (Hendriksen and van Breda 1992:455). Before an economic resource can be classified an asset in accounting terms, the resource also needs to meet the criteria of being controlled by the firm and confirmed by past transactions or events.

The asset definitions of FASB, IASB and ASB have been debated, and other definitions are suggested. Schuetze (1993, 2001) is one of the major contributors in this debate. He is concerned about the high level of abstraction in the definition: *"Defining an asset as a probable future economic benefit is to use a high-order abstraction. Under such an approach, the truck per se is not the asset. The asset is the present value of the cash flows that will come from using the truck to haul lumber, or coal, or bread"* (Schuetze (1993:67). According to him, *"[t]he definition is so complex, so abstract, so open-ended, so all-inclusive and so vague that we cannot use it to solve problems"* (Schuetze (1993:67). Instead, he proposes, according to him, a more simple definition. He suggests that assets should be defined as *"(...) cash, contractual claims to cash or services, and items that can be sold separately for cash"* (Schuetze 1993:69). Thus, he considers transferability to be an important characteristic of assets. One important characteristic of goodwill, however, is the lack of transferability. This implies that goodwill will not meet the asset criteria suggested by Schuetze (1993, 2001). Samuelson (1996) supports Schuetze (1993, 2001) in that the present asset definition is too complex, ambiguous and allows too much to the category of assets. But, he employs a different approach to derive an asset definition. He argues that the definition should not be based on future economic benefits, but on property rights: *"Future events (or flows) can be anticipated, but they cannot be observed presently. A definition of assets based on future events lacks empirical content because future events are inherently unobservable"* (Samuelson 1996:151). Instead, he argues that the asset definition should be changed from a focus on future economic benefits to rights to use economic benefits, that is, property rights. He finds the transferability criterion suggested by Schuetze (1993) useful, but not sufficient to serve as demarcation between assets and non-assets: *"In general, property rights are exchangeable and the reserve proposition should always be true: anything that is exchangeable is a property right"* (Samuelson 1996:154). Obviously, goodwill is not an asset according to his definition. It does not represent any claim on future economic benefits and thus, fails to meet the proposed asset definition. Recently, Kothari et al. (2010) have suggested a similar asset definition to the one by Schuetze (1993, 2001). They argue that the asset definition should be based on the criterion of separability which excludes goodwill. Such a definition will lead to more conservative and verifiable accounting which they claim is in the interest of both shareholders and debtholders.

2.3.1.2. Early discussion on goodwill being an asset

In the mid-1960s there was a growing dissatisfaction with the abuse of the pooling-of-interest method in the US, which at the same time triggered the debate on goodwill. Prior to the introduction of APB 16 (Accounting Principles Board 16) and APB 17 under US-GAAP the debate was focused on capitalisation or non-capitalisation of goodwill and the goodwill-asset question (APB 1970a, 1970b).

Thus, the discussion was triggered by the objective to find a proper accounting method for goodwill which in turn made the question of goodwill being an asset important. At that point in time, there existed no conceptual framework and thus, no agreed-upon asset definition for standard setting. This makes the discussion richer when it comes to ideas and arguments, but at the same time more mixed as the goodwill-asset question and the asset criteria are discussed simultaneously.

A lot of US researchers argued that the nature of goodwill prevents a classification of goodwill as an asset. One significant contributor to this debate is Chambers (1966). He argues that assets along with all other items in the financial statement should be measured according to their current cash equivalent. As goodwill lacks the ability of being transferable, Chambers (1966) concludes that goodwill should not be capitalised on the balance sheet. Catlett and Olson (1968:107) state that: *"[g]oodwill is not a resource or property right that is consumed or utilized in the production of earnings. Rather it is the result of earnings or of the expectations of them, as appraised by the investors."* They argue that the objective of financial accounting is to provide information making it possible for the shareholders to assess the firm's future prospects and thereby its value. They argue that *producing assets* of the acquired firm should be reported at fair value and that goodwill should be immediately written-off against equity. Otherwise, they claim, the financial statement will *determine* the value of the firm rather than provide the shareholders with information useful for that purpose.

The direct write-off suggestion was attacked. Some argued that goodwill should be classified as an asset and capitalised on the balance sheet. Paton (1968), for instance, makes a point of the demarcation between tangible and intangible assets. As he writes in his critical comments to Catlett and Olson's monograph: *"Assets* *are not inherently tangible or physical. An asset is an economic quantum. It may be attached to or represented by some physical object, or it may not. One of the common mistakes we all tend to make is that of attributing too much significance to molecular conception of property. A brick wall is nothing but mud on edge if its capacity to render economic service has disappeared; the molecules are still there and the wall may be as solid as ever but the value is gone"* (Paton in Catlett and Olson 1968:143). If the term *asset* is understood as future benefits, goodwill becomes no more intangible than a building. The substance of an asset, that is, a potential for future benefits, does not depend on physical representation. Gynther (1969:247-8) supports this view: *"Economic assets have economic value because they contain future, beneficial service. (...) Beneficial service potentials can exist in various forms, and if the form does have physical substance, it merely provides greater evidence that service potentials may exist."*

After the implementation of APB 17, which made capitalisation and amortisation mandatory for goodwill, the goodwill-asset discussion subsided in the US. This happened without any thorough discussion of the asset question. In the UK a couple of decades later the discussion is heated once more, triggered by the problem of selecting an appropriate accounting method for goodwill. As in the US, the views were split on which method to choose: Should goodwill be capitalised and amortised or written-off against equity? In contrast to the earlier US discussion, the UK discussion addresses the goodwill-asset question to an asset definition found in the conceptual framework. According to the ASB framework, assets are *"(...) rights or other access to future economic benefits controlled by an entity as a result of past transactions or events"* (ASB 1999:4.6). This definition is not significantly different from the asset definitions found in the conceptual frameworks of IASB and FASB, making the discussion below relevant outside the UK-GAAP area.

Some argued that goodwill fails to meet the criteria of an asset and in particular the criterion of being controlled. Arnold and Kirkman (1992) argue that for an item to be controlled, the item must be transferable, which means that it must be capable of being sold or realised independently of the other assets in the firm. This is further supported by Upton (2001:61): *"With control comes the ability to buy, sell, or withhold from the market – characteristics of the everyday notion of an asset."* Thus, Arnold and Kirkman (1992) and Upton (2001) emphasise that transferability is necessary for control. This conclusion is not obvious. For instance, some contractual-legal rights may establish property rights without being transferable (IASB 2008d: IAS 38 BC10). This suggests that an intangible asset might be controllable, even though it lacks transferability. If this reasoning holds, it will undermine the rationale of refusing goodwill as an asset due to its lack of transferability. Moreover, transferability is not a criterion of an asset. Thus, transferability is not part of the discussion of goodwill meeting the asset definition, but part of the discussion of which criteria are to be included in the asset definition.

2.3.1.3. Recent conclusion – goodwill is classified as an asset

Three leading standard setters, FASB, IASB and ASB, have recently discussed the goodwill-asset question. Surprisingly, FASB and IASB reached the opposite conclusion to the one reached by ASB. After more than 10 years of discussion and several different drafts, ASB implements the new standard for goodwill, FRS 10 (Financial Reporting Standard 10), in 1997, which makes capitalisation and amortisation of goodwill mandatory (ASB 1997). However, goodwill is not found to meet the criteria of an asset. ASB does not reveal in detail the arguments for their conclusion. Still, it is reasonable that the lack of goodwill meeting the control criterion has played an important role when reaching this conclusion (Johnson and Petrone 1998). This is supported by the interpretation ASB makes of control in its 1995 draft of the Statement of Principles: *"Items that cannot be separately identified from the business as a whole cannot be individually controlled by the entity and hence are not assets"* (ASB 1995:3.18). Tollington (1997:1) states that *"(...) purchased goodwill is not in itself an asset (...) and yet it is to be (...) capitalised and classified as an asset on the balance sheet. (...) These apparent contradictions lead one to ask; when is an asset not an asset? And the answer is when it is goodwill."* Some years later, in 2001, the US standard setter, FASB, concludes the opposite, namely that goodwill should be classified as an asset. Until then, goodwill was considered not to meet the asset definition. Still, it was capitalised on the balance sheet. In 1953 capitalisation and amortisation became the preferred method for goodwill under US-GAAP, and in 1970 it became the only legal method (APB 17). Being treated as an asset for 50 years, goodwill finally got approval as an asset. In line with international convergence, IASB makes the same conclusion in 2004 (IASB 2004d).

In the following paragraphs, IASB's arguments for classifying goodwill as an asset are discussed (IASB 2004d: IFRS 3 BC 129-35). As a starting point, it is useful to repeat the asset characteristics. Assets must represent a potential for future economic benefits, be controlled by the entity and be confirmed by past transactions or events. When assessing whether goodwill meets these criteria, IASB splits goodwill into the components suggested by Johnson and Petrone (1998). According to this decomposition, core goodwill consists of a going-concern component and a synergy component. Given that the business combination has been settled between independent, informed and willing parties, core goodwill represents expectations of future economic benefits, and thus meets the first criterion of an asset. The next, the control criterion, is not as trivial to justify. Typically, goodwill consists of intangible resources or benefits that cannot be controlled. For instance, goodwill may reflect the value of knowledge and skills held by the employees or the value of loyal customers. The employees can quit and (of course) take with them their knowledge and skills. Moreover, customers can probably meet their needs by acquiring products or services from competitors. IASB admits that some of the intangibles embedded in goodwill cannot be regarded as controlled by the firm. However, some sort of indirect control is thought to exist since the acquirer, by definition, controls the entity to which goodwill belongs. As stated by IASB (2004: IFRS 3 BC 132): *"(...) control is provided by means of the acquirer's power to direct policies and management of the acquire."* This interpretation of control is close to the interpretion found in group accounting. In real-life, control over employees' knowledge and skills or customers' loyalty is far more indirect than control over merchandise, equipment or property. Some may argue that employees' knowledge and skills or customers' loyalty in no way are controlled by the firm. The employees and customers have their free will. This leads one to ask: Will the control criterion ever play a role? If the criterion has no significance for goodwill, will it ever have significance? (Kvifte 2003:101) The position taken by IASB may suggest that any expense can be classified as an asset. IASB is aware of this criticism and has included the asset definition as part of the joint conceptual framework project. Up until the present date, IASB has replaced the traditional control criterion with *"(...) rights and privileged access to economic resources."*[2] This makes it easier to justify that goodwill indeed meets the asset definition. Apparently, the asset definition has

[2] See IASB's and FASB's project update: http://www.fasb.org/project/cf_phase-b.shtml

accommodated the characteristics of goodwill in such a way that goodwill meets the criteria of the definition. However, in a balance-oriented *deductive* conceptual framework the asset definition should be derived independently of the expected outcome for goodwill meeting that definition.

The other components that might be part of goodwill are also considered. Assets and liabilities that meet the criteria of separate recognition should be separated from goodwill and measured at their fair value. More problematic is the inclusion of potential under or overpayments which conceptually represent gains or losses. To the extent that goodwill includes these components, goodwill includes items that are not assets. However, as stated by IASB, these gains or losses are not possible to identify and measure at the date of the business combination, making it necessary to leave such gains or losses as part of goodwill (IASB 2004d: IFRS 3 BC 133-5). The conclusion of FASB and IASB ends the goodwill-asset discussion.

2.3.2. Capitalisation or non-capitalisation of goodwill

Capitalisation or non-capitalisation of goodwill is closely related to the information demands of shareholders and debtholders. Shareholders will generally demand information about the cash-generating capacity of the firm's net assets. All assets should, therefore, be capitalised on the balance sheet. Shareholders also want to hold the managers responsible for past investment decisions, which suggests that goodwill should be capitalised and amortised over expected economic lifetime. Debtholders, however, will often take a liquidation approach. This favours the direct write-off method for goodwill (Kothari et al. 2010).

Non-capitalisation of goodwill could be the result of not meeting the criteria for capitalisation, which is the case for internally-generated goodwill. It could also be due to the choice of the pooling-of-interest method when accounting for business combinations or it could be due to the initial accounting treatment of purchased goodwill, for instance the use of the direct write-off method. In the following section, internally-generated goodwill and purchased goodwill are in focus.

2.3.2.1. Internally-generated goodwill and purchased goodwill

In contrast to purchased goodwill, internally-generated goodwill is not reported on the balance sheet. Under IFRS, the prohibition against capitalisation of internally-generated goodwill is given explicitly (IASB 2008d: IAS 38.48). The asymmetric treatment of internally-generated goodwill and purchased goodwill is one of the greatest anomalies in financial accounting, causing firms growing internally to be incomparable to firms growing by business combinations (Grinyer et al. 1990). This accounting-method choice is not motivated by differences in the very nature of internally-generated and purchased goodwill. Rather, the accounting choice is motivated by problems of identifiability and measurability of internally-generated goodwill (Huijgen 1996:65).

Purchased goodwill can be reliably measured, whereas internally-generated goodwill cannot. Goodwill, both purchased and internally generated, is an inseparable part of the firm holding it. An estimate of the goodwill value is feasible when goodwill is recognised as part of a business combination. Internally-generated goodwill, however, will probably be associated with benefits rising from non-specific expenses, such as expenses for advertising, product development, staff recruitment and staff training, but not limited to these, nor do all such expenses create goodwill. Thus, it is not possible to reliably measure the cost price. Given rational and non-opportunistic managers, it is reasonable to expect that expenses, for instance advertising expenses, are spent to obtain some future economic benefits. But the initial cost price and the relation between this cost price, if possible to determine, and future economic benefits are too weak or diffuse to justify recognition (Høegh-Krohn and Knivsflå 2000). Bloom (2008:37) summarises the challenges of internally-generated goodwill as such: First, it is difficult or impossible to identify the events or transactions which contribute to the overall goodwill of the firm. Second, it is difficult or impossible to assess the extent to which past events or transactions generate future benefits, and finally, the value of such benefits are not usually capable of being reliably measured. Consequently, expenses which may reflect internally-generated goodwill are charged against the profit and loss account.

Some argue that the historical-cost approach is the main reason for non-capitalisation of internally-generated goodwill. They argue that a fair-value approach, termed *market-capitalisation approach*, will solve the controversy of goodwill: the *artificial* distinction between purchased and internally-generated goodwill and the question about goodwill amortisation (e.g. Bloom 2008). It is easy to argue, however, that a market-capitalisation approach will lead to highly subjective estimates for goodwill and a high risk of earnings management. The reported goodwill numbers will suffer from low reliability and verifiability, which in turn will harm the usefulness of these numbers for decision making.

2.4. Subsequent accounting for goodwill

Purchased goodwill has been accounted for in a number of ways. Almost every possible treatment for a debit within a double-entry system is being discussed and implemented as good accounting practise (For reviews, see Hugdes 1982, Nobes

1992, McLeay, Neal and Tollington 1999). Goodwill has been capitalised and amortised over expected economic lifetime, capitalised and tested for impairment losses, capitalised and treated as a permanent asset, charged against earnings or written-off against equity. Two categories of accounting methods can be identified. In the first category goodwill is capitalised on the balance sheet. Goodwill is either considered an asset and/or capitalised to meet the need for future matching. In the second category goodwill is charged against earnings or written-off against equity. This latter category concerns initial accounting for goodwill and is not discussed here.

2.4.1.Systematic amortisation

The historical-cost model has traditionally been related to the income orientation where revenue recognition and matching are the basic principles. According to this approach, capitalisation and amortisation is motivated by the need of future matching. A feature of the amortisation debate is the lack of addressing decision usefulness when arguing in favour or disfavour of amortisation. The latest discussion by IASB and FASB is an exception. Instead, the debate addresses the economic fundamentals of goodwill and especially whether goodwill is believed to have limited economic lifetime. The question of economic lifetime will be in focus in this section.

The controversy of goodwill amortisation is closely linked to the very nature of goodwill. As argued previously, goodwill is not transferable and identifiable unless as a residual in a business combination. This makes it difficult at a given point in time subsequent the business combination to identify and measure the portion of total goodwill that is purchased and internally generated. This is one of the main arguments for leaving amortisation of purchased goodwill. Hendriksen and van Breda (1992:646) support this view: *"(...) the time at which the original asset value is completely replaced by additional expenditures cannot be determined, even in retrospect. (...) This suggests that the original cost should remain on the books and the costs of maintenance or replacement should be charged against current income. No amortization should be made because the value of the original asset continues if proper maintenance expenditures are made."* Not being able to separate purchased from internally-generated goodwill, makes it difficult to determine the amortisation pattern for goodwill. Based on this, IASB (2004: IFRS 3 BC 140) concludes that purchased goodwill has an indefinite economic lifetime: *"The Board [IASB] observed that the useful lifetime of acquired goodwill and the patterns in which it diminishes generally are not possible to predict, yet its amortisation depends on such predictions. As a result, the amount amortised in any given period can at best be described as an arbitrary estimate of the consumption of acquired goodwill during that period."*

Some guidance, however, may be found for its estimation. In accounting theory, amortisation is seen as a process of allocation. The purpose of the amortisation charge is to measure the consumption of the benefits, ensuring that over the economic lifetime of the asset, each period is allocated its fair share of the cost of the asset (Wilkins et al. 1998, Alfredson, Leo, Picker, Pacter and Radford 2005:297). Assets by definition are expected future benefits. On acquiring these benefits, the acquirer will have expectations as to which period these benefits are to be received. This suggests that one possible approach to estimate the economic lifetime of the asset and the pattern of its consumption is to make use of the investment analysis made by the acquirer prior to the business combination. Such an analysis generally constitutes an estimate of how many years the investment is expected to contribute with net cash inflows and the pattern of these net cash inflows. Since goodwill is closely related to the acquired firm, the investment, it is reasonable to expect that the economic lifetime of goodwill is strongly positively associated with the economic lifetime of the investment. Colley and Volkan (1988:39) support this view and state that *"(...) a logical choice would be the time period selected by management to compute the present value of the excess earnings or cash flows."*

Despite the estimation challenge, few scholars doubt that purchased goodwill indeed has a limited economic lifetime. Some even argue that the lifetime is short (Hugdes 1982:146-7, Arnold and Kirkham 1992, Wang 1993). Their arguments are often supported with reference to economic theory and abnormal-return goodwill. In economic theory goodwill is measured as the present value of abnormal returns. Given perfect market conditions, there will not be any abnormal-return opportunities, and thus, no goodwill. On the contrary, in a market with imperfections, such abnormal-return opportunities may exist and even persist for some time, but probably not very long. The reason is found in the market mechanism. At any time and in any given market some firms may enjoy above-normal returns due to factors causing market disequilibrium in the short run. The existence of above-normal return in the short run will induce entry in the long run. Consequently, above-normal returns are an economic anomaly not consistent with the long equilibrium conditions (Gomes 1988).

Still, a crucial question is left unanswered: How fast will these market forces push the abnormal return towards normal risk-adjusted return? This depends on the factors creating goodwill in the first place. Given that purchased goodwill represents factors causing abnormal returns, goodwill can be seen as the competitive advantages held by the firm. Resource-based theory may be helpful to enlighten the way goodwill diminishes. Within this theory, a framework called the VRIO framework is essential to help identifying and assessing potential competitive advantages. In order to meet the characteristics of a sustained competitive advantage, it must represent economic benefits, be rare, hard to copy and the entity that possesses or has access to the advantage must know how to exploit it (Barney 2002:155-85).[3] The stronger these factors are present, the more likely it is that this advantage really gives rise to abnormal returns. For the abnormal returns to last for some time, all the factors referred to above must be strongly present. For instance, if a resource gives rise to a competitive advantage, but the advantage is easy to copy, it is reasonable to believe that this advantage will last for a short time only. If the resource is rare and at the same time hard to copy, the economic benefits will probably last for a longer period of time. Given that these benefits are part of purchased goodwill, the above framework might be useful.

Another argument for amortisation is that purchased goodwill holds the same main characteristics as other long-lived assets. Just as other assets are subject to exhaustion, so is goodwill. For instance, Hugdes (1982) argues that goodwill is no different from other assets. The difference between goodwill and other assets are differences of degree rather than nature. In particular, he states: *"Attempts to require amortisation of goodwill represent the logical extension of accounting conventions to goodwill that are applied to other assets. Based on the premise that goodwill is an asset, the treatment represents uncompromising adherence to*

[3] Two lines of strategy literature are useful in order to understand the main sources of competitive advantage: the industrial-organisation model developed by Porter (1980, 1985) focusing on factors at industry level, and the resource-based model of competitive advantages focusing on firm-specific factors (e.g. Wernerfelt 1984, Barney 1991, 2002).

determination of profitability through matching of expired costs with revenues" (Hugdes 1982:147).

A few scholars, however, have questioned whether goodwill is subject to consumption. Catlett and Olson (1968) may represent this group of scholars. They use the odd nature of goodwill as basis for their non-amortisation position: *"Goodwill is a value which attaches only to a business as a whole; it has no specific term of existence as do certain property rights. The value of goodwill may, and does fluctuate suddenly and widely because of the innumerable factors – factors affecting earnings power or investors opinion about earnings power, which influence that value"* (Catlett and Olson 1968:85). Referring to these characteristics, they conclude that *"[g]oodwill value is not consumed or used in the production of earnings as the separable resources and property rights of a business. Rather goodwill is the result of earnings or the expectations of them, and its value fluctuates as earnings and expectations of earnings vary"* (Catlett and Olson 1968:85). Graham (1987:22) takes a similar position: *"When profits are earned we do not regard part of the investment as having been used up and any dividend being received as being a realisation of the original investment. On the contrary, we assume that the achievement of the expected level of earnings has the effect, not of reducing the value of the investment, but of confirming its value."*

Among practitioners the arguments by Catlett and Olson (1968) and Graham (1987) have been extremely popular. Some have also argued that goodwill amortisation leads to non-cash charges with no significance. In particular, managers *"(...) emphasize earnings before goodwill amortisation in (...) earnings releases and reports to shareholders"* (Jennings et al. 2001:21). The same notion is expressed by Lindenberg, Ross and Barney (1999). They state that *"(...) the*

SEC [Securities and Exchange Commission] and FASB should consider requiring firms to report EPS on a pre-amortization basis even if net income is reported on a post-amortization basis" (Lindenberg et al. 1999:41). The desire to avoid goodwill-amortisation charges is part of a larger picture. The popularity of the direct write-off method under UK-GAAP and the pooling-of-interest method under US-GAAP can be explained by the managers' aversion to report goodwill-amortisation charges. Ultimately, the amortisation charges have a serious negative effect on earnings. Moehrle, Reynolds-Moehrle and Wallace (2001:244) show one extreme example where the amortisation of goodwill turned positive earnings into a significant negative earnings figure: *"(...) MindSpring Enterprises reported a 93 cent loss per share as its traditional accounting earnings disclosure, but positive earnings before goodwill amortisation totalling 94 cents per share for the same period."* Referring to Nielson (1999) they explain managers' eager to report earnings before amortisation charges as such: *"All firms would like their earnings reported on a cash basis (cash earnings), because earnings are higher, price-earnings multiples are higher, and this will justify a higher stock price"* (Moehrle et al. 2001:244). A non-amortisation position leads to higher reported earnings. Managers believe that higher reported earnings have a favourable effect on stock prices, their own compensation and reputation. This may explain their dislike of goodwill-amortisation charges (Nobes 1992). Goodwill amortisation has, therefore, been high on the standard setters' and the financial-accounting preparers' and users' agenda for years. The latest change in accounting for goodwill has left goodwill amortisation in favour of an impairment-only method. This last method is in focus in the next section.

2.4.2.Impairment testing and no systematic amortisation

The recent change in accounting for goodwill under IFRS and US-GAAP represents a shift in accounting models and measurement attributes. The historical-cost model is replaced by a fair-value accounting model (Ramanna 2008, Ramanna and Watts 2009, Kothari et al. 2010). Goodwill is now measured as the fair value of the consideration paid reduced by the fair value of identifiable assets and liabilities (IASB 2008: IFRS 3). This measurement procedure will provide a value close to a fair-value estimate of goodwill. Subsequent impairment testing is done by comparing the recoverable amount with the carrying amount of the cash-generating unit to which goodwill is allocated. This section focuses on the arguments in favour and disfavour of the impairment-only method put forward by IASB.

The idea of an impairment-only method is not new in financial accounting. Treating goodwill as a permanent asset, i.e. with no amortisation, was common accounting practise in the US early in the 20th century (Hugdes 1982). Even as late as the beginning of the 1980s some firms carried permanent goodwill on their balance sheets in the UK (Nobes 1992). Several scholars have argued that goodwill should not be amortised as long as its recoverable amount is maintained. As stated by Gynther (1969:228): *"(...) the purchase price of goodwill (...) must be treated for what it really is, and goodwill must at least be left intact as long as the earnings power of the entity is unimpaired."* Some even find it surprising that it has taken so long before such arguments have become mainstream (Bloom 2008:78). However, the change in accounting method for goodwill seems hard to justify based on economic fundamentals. It is common belief that goodwill has limited economic lifetime which implies amortisation. Rather, the reason for the change seems to be pragmatic. It is difficult to determine whether an expense for marketing, organisation development or product development has maintained or even increased the value of existing goodwill. In other words, it is difficult at a point in time subsequent to the business combination to distinguish remaining purchased goodwill from internally-generated goodwill.

Testing goodwill for potential impairment losses is challenging. As stated previously, goodwill is not transferable, and thus, there will not be any separate market price that can justify the reported goodwill amount. Besides, it is not possible to separately determine the net cash inflows generated by goodwill. The net cash inflows are generated in synergy with other assets in the firm, which in turn makes it difficult to estimate a current value for goodwill. Still, the impairment regulation requires goodwill to be allocated to cash-generating units at levels below or equal to the segment-level. The purpose of this allocation is to assign goodwill to those cash-generating units where goodwill is believed to contribute with earnings power and by that, provide a basis for impairment testing.

Several factors, however, may shield an impairment loss from being recognised. First, the impairment test employs the carrying amount of the units' recognised assets. If the fair values of these assets are higher than their carrying amounts, the extra benefits related to these assets increase the recoverable amount of the units and may shield impairment losses in purchased goodwill. Second, internally-generated goodwill may replace impaired purchased goodwill. If the recoverable amount is lower than the carrying amount, an impairment loss must to be reported for goodwill. The regulation does not require any distinction to be made between internally-generated goodwill and purchased goodwill when estimating the recoverable amount of the cash-generating units. This means that internally-generated goodwill can be indirectly capitalised. The standard setter, IASB (2004:

IFRS 3 BC 134-5), is aware of this problem, but explains why such a distinction is impossible: *"(...), goodwill acquired in a business combination and goodwill generated after that business combination cannot be separately identified, because they contribute jointly to the same cash flow. Therefore, (...) the objective of the goodwill impairment test could at best be to ensure that the carrying amount of goodwill is recoverable from future cash flows expected to be generated by both acquired goodwill and internally generated goodwill after the business combination."* The idea is that as long as the total value of goodwill, that is the earnings power, is maintained, it is of less interest for financial-accounting users whether this earnings power is generated by purchased and/or internally-generated goodwill. This makes it possible, given that purchased goodwill has limited economic life or has impaired, to indirectly capitalise internally-generated goodwill. In other words, by implementing this impairment method for goodwill, a business combination will not only constitute a purchase of the entity's net assets inclusive goodwill, but also a right to capitalise internally-generated goodwill up to the goodwill amount initially recognised in the acquisition analysis.

A related issue is the indirect test procedure for goodwill under IFRS. The test is performed on cash-generating units to which goodwill is allocated and not on goodwill. This means that a recognised impairment loss in the cash-generating unit may have its origin in goodwill and/or other assets in the cash-generating unit. The impairment loss is arbitrarily allocated to goodwill first without any subsequent test to determine whether it really is impaired. The US-standard SFAS 142, however, requires a two-step test for goodwill. The first step recognises whether there is an impairment loss in the cash-generating unit.[4] This step is identical to the IFRS-regulation. If there is an impairment loss, the next step will

[4] The standard uses the term *reporting unit* instead of cash-generating unit.

be to estimate the implied fair value of goodwill. To finish the second step, goodwill is estimated as if the cash-generating unit was purchased in a business combination which requires fair values for the assets and liabilities in the cash-generating unit. This makes the two-step test relatively more comprehensive and costly than the one-step test under IFRS.

FASB received significant criticism on the two-step test. An extract from the comment letters may serve as an illustration: *"The mechanism of the impairment test will be cost prohibitive to undertake. The Board cannot seriously expect to regularly estimate the fair value of its assets and liabilities in attempting to calculate the implied fair value of goodwill. Our experience with obtaining such appraisals in the context of business acquisitions has led us to believe that any benefit from such impairment measurements is far outweighed by the prohibitive costs of retaining and regularly engaging outside experts whose opinions can vary widely in their professional assessment"* (FASB 2005 Summary of Comment Letters). IASB (2004b: IAS 36 BC 170) supports this argument and states that *"(...) the complexity and costs of applying the two-step test (...) would outweigh the benefits of that approach"*, leaving the two-step test in favour of a one-step test.

The shift to the impairment-only method is based on the premise that goodwill-amortisation charges are arbitrary and are void of decision usefulness. Two factors seem particularly important when predicting the decision usefulness of goodwill numbers under the impairment-only approach relative to the amortisation approach: the degree of faithful representation of economic fundamentals and the degree of discretionary freedom offered by these two methods. The first factor will affect the relevance and the reliability of the goodwill numbers. A goodwill-amortisation approach will be more consistent with economic fundamentals of goodwill if goodwill has limited economic lifetime. At the same time, it is difficult to reliably measure the way goodwill is consumed, which may harm both the reliability and relevance of the accounting numbers. The impairment-only approach, however, makes it possible to indirectly capitalise internally-generated goodwill, which may suggest increased relevance. On the other hand, the regulation of goodwill-impairment losses is believed to provide the managers with more discretionary freedom than under the previous amortisation method (Watts 2003, Ramanna 2008, Ramanna and Watts 2009, Kothari et al. 2010). This will probably increase the incidence of earnings management. The next section will discuss, in particular, the discretionary freedom offered by the impairment-only method.

2.4.2.1. Discretionary freedom in impairment testing

The degree of discretionary freedom in impairment losses is only interesting if the reporting flexibility is relatively higher or lower than under the previous amortisation method. If the discretionary freedom is supposed to be equal, it is reasonable to expect that both methods will be subject to the same intensity of opportunistic earnings management. However, there are reasons to believe that the impairment-only method offers more discretionary freedom than the amortisation method (Watts 2003, Ramanna 2008, Ramanna and Watts 2009, Kothari et al. 2010). Goodwill-amortisation charges are indeed discretionary in nature, but at a discount relative to goodwill-impairment losses. As stated earlier, it is not possible to observe the consumption of goodwill. Still, goodwill-amortisation charges are believed to be more verifiable and thereby easier to audit. The amortisation plan is generally linear and most accounting regimes require a maximum amortisation period of 20 or 40 years.[5] Besides, every change in the amortisation plan and the effects of such changes on accounting numbers must be revealed in additional disclosures. This makes it difficult to employ changes in goodwill amortisation as a reporting strategy. Reported impairment losses, however, are easy to manipulate and very difficult to audit. As managers generally have superior information about the firm's future prospects, it is difficult for auditors to question estimates and assumptions made by the managers regarding impairment testing, if they are not clearly unreasonable (Benston et al. 2007).

The flexibility of the impairment regulation is easy to demonstrate. Flexibility is given when it comes to the allocation of goodwill to cash-generating units, the frequency of impairment testing and the measurement of impairment losses. First, impairment test of goodwill can be performed at any date during a year, but has to be executed at the same date each year for the same cash-generating unit (IASB 2008a: IAS 36.90). The choice of test-dates can, therefore, be made according to the managers' reporting strategy. If the managers want to shift earnings from future periods to the present by avoiding goodwill-impairment losses, cash-generating units that operate in seasonal industries should be tested during periods of the year where the cash-generating units' recoverable amounts are at the highest.[6] In contrast, if managers intend to shift earnings from the present into the future by overstating goodwill-impairment losses, impairment-test dates should be chosen to minimise the recoverable amounts of the cash-generating units.

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[5] For instance, US-GAAP required that goodwill should be amortised over a period not to exceed 40 years (APB 1970b), and UK-GAAP has a presumption that goodwill shall not be amortised over more than 20 years (ASB 1997).

[6] It could be argued that the testing dates make no difference. However, in practice forecasting periods are short and terminal values are not necessarily defined as perpetuity. Also, when recoverable amounts are measured using other estimates than present values, the testing dates are likely to be relevant.

However, the requirement to test each cash-generating unit at the same date each year, limits managers' discretionary freedom.

The regulation offers an exception from estimating the recoverable amounts each year. For the exception to take effect, three cumulative requirements must be met (IASB 2008a: IAS 36.99). First, assets and liabilities allocated to the units have not changed significantly since last time the recoverable amounts were estimated. Second, when the recoverable amounts of the cash-generating units were estimated the last time, they exceeded the cash-generating units' carrying amounts by substantial margins. Third, an analysis of events and changes in circumstances suggests that the probability that the recoverable amounts have fallen below the carrying amounts of the units is remote. The managers are, therefore, left with discretion to sidestep impairment tests of goodwill. The list of indicators suggesting that assets are impaired also provides some discretionary freedom. Since a fixed test date for each cash-generating unit might preclude timely recognition of impairment losses, IAS 36 provides a non-exhaustive list of impairment indicators (IASB 2008a: IAS 36.12). An unscheduled impairment test is required when one or more of these indicators suggest that the asset has impaired. Since the list is non-exhaustive, managers are free to find additional impairment indicators. To the extent that overstated impairment losses are consistent with managers' reporting strategies, the managers have incentives to employ events and circumstances other than those listed as impairment indicators.

The allocation of goodwill to cash-generating units may influence the likelihood of reporting impairment losses in the future. According to IAS 36, goodwill shall be tested for impairment losses at a level of reporting referred to as cash-generating unit or groups of cash-generating units (IASB 2008a: IAS 36.80). The higher the level of aggregation at which cash-generating units are formed, the larger is the probability that a decrease in goodwill will be compensated by internally-generated goodwill in another cash-generating unit. Therefore, the level at which an entity defines its allocation units for goodwill determines to a large extent the likelihood of reporting goodwill-impairment losses in subsequent periods (Henning, Shaw and Stock 2004, Zang 2008, Ramanna 2008, Ramanna and Watts 2009).

The most significant discretionary element in the testing procedure relates to the estimation of recoverable amounts. The recoverable amount is the higher of the value-in-use and the fair value (IASB 2008a: IAS 36.18). The fair value will be an observed market value of the cash-generating unit or a market value of a similar cash-generating unit. If market values are unavailable, calculating the present value of future net cash flows is the best available method to get an estimate of the recoverable amount. The present-value technique requires estimates of future cash flows, or in more complex cases, expectations about possible variations in the amount and timing of the cash flows. In order to achieve more reliability, external information should be given more weight than internal information (IASB 2008a: IAS 36.33). The present-value technique provides plenty of room for discretionary freedom. Even when managers try to estimate unbiased recoverable amounts, the problems associated with uncertain future cash flows and risk-adjusted rates are serious. This makes it reasonable to question the relevance and reliability of the recoverable amounts and by that, the impairment losses calculated upon them (Watts 2003).

This section has demonstrated that in most of its facets goodwill-impairment testing is a highly discretionary procedure that allows managers to coordinate impairment accounting to their reporting strategy. The discretionary freedom can be exploited to understate impairment losses and overstate current earnings and net assets or to overstate impairment losses, understate current earnings and net assets. Assumptions and estimates and other subjective elements are required at all stages (Ramanna 2008, Zang 2008, Ramanna and Watts 2009). This suggests that the impairment-only approach provides managers with opportunities to engage in earnings management, which may impair the decision usefulness of goodwill numbers.

3. Value relevance – some fundamentals and prior evidence for goodwill

The value-relevance methodology is supposed to provide some evidence on the decision usefulness of accounting for equity valuation. This makes the methodology particularly suited for examining the usefulness of accounting information under alternative accounting methods. The first part of the chapter discusses the fundamentals of value relevance: definitions and interpretations of value relevance, the relationship between value relevance and decision usefulness and fundamentals of the value-relevance methodology. The second part of the chapter discusses prior value-relevance findings for book goodwill, goodwill-amortisation charges and goodwill-impairment losses. Some evidence on the information content of impairment losses and write-downs are also discussed.

3.1. Value relevance defined

The value-relevance literature is an important part of the research area investigating the relationship between financial-accounting information and capital markets[7], generally referred to as market-based accounting research (Lev and Ohlson 1982, Kothari 2001, Beaver 2002). Value-relevance research is defined rather broadly. Beaver (2002:459), for instance, states that *"[v]alue-relevance research examines the association between a security-based dependent variable and a set of accounting variables. An accounting number is termed 'value-relevant' if it is significantly related to the dependent variable."* Despite this, value-relevance research does have some specific characteristics that distinguish it from other lines of market-based accounting research such as

[7] If not stated explicitly, capital markets are *equity-capital markets* in this dissertation.

research on fundamental analysis and market efficiency. First, value-relevance research is generally motivated by *giving standard-setting implications* (Barth, Beaver and Landsman 2001). None of the other market-based accounting research areas are basically motivated by standard-setting issues. Value-relevance researchers will, therefore, need in-depth knowledge about accounting institutions, accounting standards and how to construct accounting numbers. Such knowledge is generally not required in other areas of market-based accounting research (Beaver 2002). Second, the value-relevance methodology is generally based on the assumption of *market efficiency* (Holthausen and Watts 2001). In research on fundamental analysis, however, markets are assumed to suffer from imperfections which lead to *market inefficiency*. Moreover, in research investigating market efficiency, the degree of efficiency is the object of investigation, rather than being a premise of the research methodology. And finally, research on fundamental analysis may include all variables that potentially explain current firm values and predict future firm values. This research is generally not concerned with whether or not price-relevant information is reported in financial statements or reported elsewhere. In contrast, value-relevance research has particular focus on whether financial statements reflect price-relevant information.

Francis and Schipper (1999) present four interpretations of value relevance. The first interpretation contradicts the above characteristics of value relevance. This interpretation is based on the premise that accounting information leads stock prices by capturing intrinsic values toward which stock prices drift. Value relevance is measured as the profit that can be earned by implementing accounting-based trading rules, which is close to fundamental analysis. Accounting numbers rather than stock prices are assumed to reflect intrinsic values, which contradicts the assumption of market efficiency. The difference between accounting numbers and expected future cash flows is considered as measurement errors, not as the object of primary interest. This suggests that no standard-setting motivations are involved which are inconsistent with the basic characteristics of value-relevance research.

The second interpretation by Francis and Schipper (1999) suggests that accounting information is value relevant if it contains information that can be used in a valuation model or information that can be used to assist in predicting these variables. Again, this interpretation is close to fundamental analysis. The fact that both value relevance and fundamental-analysis research employ the same theoretical valuation models as justification for their regressions may explain why some researchers consider value relevance as part of fundamental analysis (Kothari 2001). The role of the error term in regressions of stock prices on accounting numbers may stress some of the differences between fundamental analysis and value relevance. In fundamental analysis the error term is seen as other price-relevant variables that should be uncovered in order to enhance the valuation model. In value-relevance research the error term might be interpreted as insufficient recognition of earnings, assets and liabilities or as measurement errors in reported earnings, assets and liabilities. As fundamental analysis has a valuation perspective, value relevance has an accounting perspective. Holthausen and Watts (2001) claim that value-relevant accounting numbers should either measure equity values directly (direct valuation) or provide information useful for that purpose (inputs-to-equity valuation). Others, however, argue that value-relevance research has no intention to estimate firm value (Barth et al. 2001). This is the objective of fundamental analysis. Rather, value-relevance research has the intention to give some insight about how well accounting numbers measure firm value or provide information about firm value (Barth 2000).

The interpretation of Francis and Schipper (1999) also suggests that not only studies examining the association between accounting numbers and stock prices should be considered as value-relevance studies, but also studies that examine the association between accounting numbers and variables used for valuation e.g. future earnings, accruals or cash flows. For instance, Finger (1994:210) employs an interpretation similar to the one above: *"This article examines the value relevance of earnings by testing their ability to predict two future benefits of equity investment: earnings and cash flows from operations."* Thus, the value relevance of earnings *"(...) might be measured by the ability of earnings to predict future dividends, future cash flows, future earnings, or future book values"* (Francis and Schipper 1999:325). Jarva (2009) argues that demonstrated associations between accounting numbers and future cash flows are direct evidence of value relevance. According to him, stock prices are only noisy proxies for expected cash flows. They are not themselves cash flows. Others take the opposite position. A test of the association between accounting numbers and variables used for valuation will not bring direct, but indirect support for value relevance. A direct test will be to examine the association between accounting numbers and a measure of firm value such as stock prices. As argued by Beisland (2009), a demonstrated association between current earnings and say, next year's earnings or next year's cash flows is not a perfect substitute for a similar association between current earnings and stock prices. The reason is that next year's earnings or cash flows are believed to be a noisier estimator of the fundamental value of the firm than stock prices. In this dissertation studies examining associations between current accounting numbers and future earnings, accruals in earnings, cash flows or book-equity values are not considered as part of the value-relevance literature.

According to interpretation three and four, value relevance is indicated by a statistically significant association between accounting numbers and stock prices. Interpretation three concerns information-content studies and suggests that value relevance is demonstrated if accounting numbers reveal new and relevant information to the capital market. Interpretation four concerns long-term association studies and suggests that value relevance is demonstrated if accounting numbers are capable of capturing and summarising information useful to explain or predict firm value (Alciatore et al. 1998, Hitz 2007, Song, Wayne and Yi 2010). The information-content studies are often referred to as short-term event studies as opposed to long-term event studies[8] (Kothari 2001). These short-term event studies provide strong evidence of accounting information playing a role in changing investors' beliefs (Lev 1989). These studies investigate whether accounting numbers provide new and relevant information to the capital market measured as the market response in short windows surrounding the announcement day of that information (Lev 1989, Barth 2000, Kothari 2001, Hitz 2007). Short-term event studies address other research questions than long-term value relevance studies. They provide evidence on the relevance and timeliness of accounting numbers. They do not address whether certain items in the financial statements such as book goodwill and goodwill-impairment losses capture and summarise information reflected in stock prices or whether book goodwill and goodwill-impairment losses reflect economic assets and economic losses (e.g. Barth 2000, Beaver 2002). Long-term value relevance studies, however, typically address these issues.

[8] These are not the same as long-term value relevance studies referred to below. Long-term event studies are generally investigating post-earnings announcement drift.

Short-term event studies will probably not provide evidence useful for standard-setting deliberations. For instance, it seems unreasonable to exclude items of the profit and loss account and the balance sheet simply because the information could easily be predicted, and therefore, is not new to the capital market (Barth et al. 2001, Beaver 2002). Relying on new information as the criterion for accounting recognition will probably lead to the exclusion of a lot of assets, liabilities and other items from the financial statement. Such exclusions will not be consistent with the recognition criteria for assets, liabilities, revenues and charges in the conceptual frameworks. Rather, the financial statement is intended to be complete within the constraints, the definitions and the recognition criteria of accounting (Beaver 2002). One main purpose of this dissertation is to give standard setters some indications on the decision usefulness of goodwill-accounting numbers. Since the very purpose of conceptual frameworks is to guide standard setters on accounting-policy choices, it is reasonable to use these frameworks as reference point when choosing the methodological design. A short-term association study will provide evidence on the relevance and in particular the timeliness of accounting numbers. But such evidence is not particularly relevant to the standard setters. A long-term association study, however, is capable of providing evidence on the extent to which accounting numbers represent economic fundamentals reflected in stock prices. This is more consistent with the recognition criteria found in the conceptual frameworks. Still, short-term association studies are not totally excluded from this dissertation (See section 3.4.3 and 4.2.1 below). Evidence from these studies will be discussed when relevant.

Interpretation four by Francis and Schipper (1999) will serve as basis for a definition of value relevance in this dissertation. The chosen definition is as follows: *An accounting number is considered value relevant if it has a predicted* *long-term association with stock prices or stock returns.* This definition differs from some previous definitions of long-term value relevance. For instance, value relevance might be defined as the ability of accounting numbers to capture and summarise information useful to explain or predict firm value (Alciatore et al. 1998, Hitz 2007, Song et al. 2010). This definition excludes any concerns about timeliness in accounting numbers and will generally lead to a price-level regression where stock prices are regressed on accounting numbers. Timeliness is particularly important when investigating goodwill-impairment losses (Heflin and Warfield 1997, Bartov, Lindahl and Ricks 1998, Li, Shroff and Ventakaraman 2005). Thus, the chosen value-relevance definition should involve timeliness. Long-term association studies might indicate timeliness. For instance, significantly negative associations between goodwill-impairment losses and contemporaneous stock returns suggest that these losses are relatively timely reported (Barth et al. 2001). This suggests that long-term return-earnings regressions should be employed along with price-level regressions in this dissertation (Barth et al. 2001). A more careful discussion of the price-level and return-earnings regressions is given in section 3.3.2.5 below.

According to the chosen definition, two criteria are important in order to demonstrate value relevance. The association between the accounting number and stock prices or stock returns must be *significantly different from zero* and with the *predicted sign* (Barth et al. 2001). The latter requirement is generally left out in previous definitions of value relevance (e.g. Barth and Landsman 1995, Barth 2000), but is considered to be important. A simple example may clarify the significance of this criterion. The association between book goodwill and stock prices is expected to be positive (Amir et al. 1993, Wang 1993, Chauvin and Hirschey 1994, Jennings et al. 1996a, Huijgen 1996, Barth and Clinch 1996, Wilkins et al. 1998, Henning et al. 2000, Petersen 2001, 2002, Bugeja and Gallery 2006, Jifri and Citron 2010). If the association turns out to be significantly negative, the first, but not the second criterion is met. Book goodwill has a significant coefficient, but the sign of the coefficient is inconsistent with expectations and impossible to interpret without additional analyses. According to the above definition of value relevance, such a result will reject the hypothesis that book goodwill is value relevant.

3.2. Value relevance – a measure of decision usefulness

Value-relevance research is supposed to provide some evidence on the decision usefulness of accounting numbers (Lev 1989, Barth 2000, Barth et al. 2001, Holthausen and Watts 2001, Landsman 2007). The strong faith in the relevance of this research for standard setting is demonstrated in the literature review by Holthausen and Watts (2001). As much as 54 out of 62 value-relevance articles explicitly state that the research is motivated by standard-setting issues. The relevance of this research for standard setting might also be indicated by standard setters' own references to the research area. For instance, in the joint conceptual-framework project of IASB and FASB, the standard setters discuss the extent to which faithful representation can be empirically measured. Specifically, they state that value-relevance research has *"(...) accumulated considerable evidence supporting the combination of relevance and faithful representation of accounting information for measurement purposes by correlation to market prices and changes in them"* (IASB 2008f: Exposure Draft of an Improved Conceptual Framework for Financial Reporting 2.23). The standard setters also employ results from the value-relevance literature when justifying the impairment-only method for goodwill: *"(…) straight-line amortisation of goodwill over an arbitrary period fails to provide useful information. The Board noted that both anecdotal and* *research evidence supports this view"* (IASB 2004d: IFRS 3 BC 140). A parallel reference to the value-relevance literature is made by FASB. Still, it is not evident that the value-relevance research is useful for standard setting (Holthausen and Watts 2001).

In order to discuss the usefulness of this research for standard setting, it is necessary to make references to the conceptual frameworks whose purpose is to guide standard setters in their accounting-policy decisions. The most important of these references are those to the overall objective of financial accounting, the financial-statement users and the qualitative characteristics of financial accounting. The main objective of financial accounting is to provide decision-useful information (Ijiri 1983, Lennart 2008). This means that the financial statement shall assist the users in making decisions upon the firm (Lennart 2008). Information is decision useful if it assists investment-valuation decisions and stewardship decisions (Kothari et al. 2010). The financial statement shall provide information that meets both purposes (FASB 1978, IASB 1989). Some argue, however, that the information needs for investment valuation are rather different from the information needs for stewardship. Investment valuation will obviously require forward-looking information, whereas stewardship will require more backward-looking information (Beaver and Demski 1979, Kirk 1998). This suggests a conflict between these two demands of information. Gjesdal (1981) supports this view. He argues that these two demands require different sets of information. A similar view is given by Ijiri (1983). He points out important differences between investment valuation and stewardship: More information is better in investment valuation as long as the benefits of additional information exceed the costs. This is not necessarily the case under stewardship: *"(...) the accountee has certain right to know; at the same time, the accountor has a right to* *protect privacy. More information about the accountor is not necessarily better. It is perhaps better from the standpoint of the accountee but not necessarily from the overall accountability relation"* (Ijiri 1983:75). He also argues that subjective non-verifiable information is insufficient in meeting the stewardship demand, but not necessarily in meeting the investment-valuation demand. Kothari et al. (2010) argue that there might be a conflict between these two demands, but that information relevant for stewardship may also have relevance for valuation purposes.

Others, however, argue that no conflict exists. Gore (1992), for instance, claims that the stewardship demand is met if the investment-valuation demand is met. Lennart (2008) takes a similar position. He does admit, however, that the exclusion of stewardship incurs the risk that those who argue for the inclusion of information required for an assessment of stewardship will be placed at a disadvantage. According to him, stewardship and investment valuation are complementary demands rather than contradictory demands. A similar position is taken by IASB and FASB in their discussion paper on a new conceptual framework (IASB 2006). They argue that the information needed for investment valuation will also be needed for stewardship. However, this argument led to massive criticism from commentators, which eventually led to the inclusion of stewardship as a separate objective in the exposure draft of the conceptual framework (IASB 2008e). Thus, there is no general agreement that the investment-valuation demand and the stewardship demand are met by the same set of accounting information. Rather, it is likely that any attempt to meet both the investment valuation and the stewardship demand will be too ambitious (Aitken 1990, Kvifte 2003). A preference for one of these two is probably necessary. In recent years, the leading standard setters have expanded fair-value accounting to assets and liabilities where no observable market prices are available, which has led to a more excessive use of non-verifiable fair-value estimates. This suggests that the standard setters have de-emphasised stewardship relative to investment valuation (Lambert 2010). This de-emphasis is not uncontroversial (Kothari et al. 2010).

The financial statement has a wide range of potential users such as investors, creditors, suppliers, employees, management, regulatory authorities, financial press and the public (e.g. FASB 1978). Both FASB and IASB consider investors as primary users of financial statements (FASB 1978, IASB 1989). Investors are current and potential shareholders. FASB also includes creditors who consist of all sorts of debtholders such as lending institutions, individual lenders, trade creditors and customers and employees with claims (FASB 1978). This broader view of primary users is also found in the exposure draft of the conceptual framework. In this draft capital providers are defined as the primary users of financial statements (IASB 2008e). There are at least three arguments for this narrow focus. First, the objective and users of financial statements need to be focused to avoid being too vague and abstract (FASB 1978). Second, the different users will obviously demand different information and in some cases these demands will be conflicting (Holthausen and Watts 2001, Kothari et al. 2010). Based on this premise, it can be argued that it is impossible to meet all demands (Aitken 1990, Kothari et al. 2010). And finally, the narrow focus is justified by the notion that the information needs of investors (and creditors) are so comprehensive that meeting their needs will meet most of the needs of other users of financial statements (IASB 1989). Even narrowing down the primary users to investors and creditors will not remove the problems of balancing different users' needs of information. Creditors are generally more interested in debt valuation and default risk than equity valuation.

Hence, it is not apparent that decision usefulness of a piece of accounting information is the same for investors and creditors (Holthausen and Watts 2001, Watts 2003, Kothari et al. 2010). Creditors will probably demand more conservative and verifiable accounting information (Watts 2003, Kothari et al. 2010). The recent trend to allow excessive use of unverifiable fair-value accounting suggests that the information needs of investors are emphasised more than the information needs of creditors (Lambert 2010). This justifies the emphasis on investors' needs of information in this dissertation.

Relevance and reliability are the two fundamental criteria of decision usefulness (Solomons 1986, Barth et al. 2001, Liang 2001, Barley and Haddad 2003). These criteria can be used to distinguish more from less decision-useful information. If the information lacks relevance and/or reliability, it will not be useful for decision making. Recently, the leading standard setters, IASB and FASB, have replaced reliability by faithful representation (IASB 2008e). The new framework is not yet effective. This justifies the use of the previous conceptual frameworks of IASB and FASB as references when discussing the qualitative characteristics.

A piece of information is considered relevant if it makes an impact on the decision maker in a particular situation. Relevant information must be *"(...) capable of making a difference in a decision by helping users to form predictions about the outcomes of past, present, and future events or to confirm or correct expectations"* (FASB 1980:2.47). This makes relevance the most important criterion for decision usefulness. If information lacks relevance, it makes little difference what other qualities it has. The information will still lack decision usefulness (FASB 1976). Relevant information must have predictive value and/or feedback value and timeliness. The predictive value is necessary for the information to be useful for valuation purposes. The feedback value, however, will involve both the valuation and the stewardship role of accounting. The other main qualitative characteristic, reliability, is interpreted as the degree of confidence that can be placed on the accounting information (FASB 1976:155). Verifiability, faithful representation and neutrality are all parts of reliability. Verifiability is *"(...) a quality that may be demonstrated by a high degree of consensus among independent measurers using the same measurement methods"* (Sterling 1975:30). Verifiability is, therefore, an assurance for the users that the accounting information represents what it purports to represent. Faithful representation, the second element of reliability, has a conceptual meaning close to validity (Benston et al. 2007). And finally, neutrality can be interpreted as representational accuracy (Solomons 1978).

The value-relevance methodology is supposed to aid standard setters when making accounting-policy deliberations. In order to do so, value-relevance studies must provide evidence on the decision usefulness of accounting information, which necessitates tests of relevance and reliability (Barth 2000, Barth et al. 2001, Barth 2007). However, value-relevance studies are not intended to provide sufficient evidence for *making* policy decisions. Standard setting involves complex social-welfare concerns which are not considered in value-relevance studies (Lev 1989, Barth 2000, Barth et al. 2001, Barth 2007, Scott 2012:153). The value-relevance research can, however, be helpful when identifying policy issues. The research can also help standard setters in structuring their thinking about particular policy issues and provide evidence that speaks to particular policy issues (Barth 2000, Barth 2007). Value relevance might be seen as empirical operationalisation of key dimensions in the conceptual framework (Barth et al. 2001). The research emphasises equity investors and equity valuation (Holthausen and Watts 2001). This does not suggest, however, that the value-relevance researchers consider other uses of financial-accounting information such as stewardship uses as less important. Rather, the emphasis on equity valuation is a result of wellknown limitations in value-relevance methodology and findings. Significant associations between accounting numbers and stock prices will provide evidence on the *valuation* usefulness of these numbers, not the stewardship usefulness. This implies that there are limits to what can be learned from value-relevance research (Holthausen and Watts 2001). For instance, the usefulness of particular accounting numbers in contracting such as management-compensation contracts and debt contracts cannot be learned from value-relevance findings. But this does not imply that value relevance is of no use when making policy deliberations (Barth et al. 2001). The recent trends towards fair-value accounting suggest that the standard setters consider investment valuation as the primary use of accounting and investors as the primary users (Barth 2006, Lambert 2010). Conservatism is not a primary accounting principle and verifiability is no longer a primary qualitative characteristic in financial accounting (Kothari et al. 2010). Given this, value-relevance studies are probably more suited to provide useful evidence for standard setting today and in the future, than some years ago. Thus, the argument presented by Lee (2001:13) does not seem to be fully valid: *"Until accounting regulators decide that reported earnings should include anticipated profits from future exchanges (that is, until we abandon the "revenue recognition principle), it is difficult to see how higher correlation with contemporaneous returns should have any standard-setting implications."* The proposed conceptual framework and the excessive use of fair value suggest otherwise.

The value-relevance methodology is supposed to provide tests of relevance and reliability. Barth et al. (2001:81) state that *"(...) value relevance indicates that the accounting amount is relevant and reliable."* But, they emphasise that it can be difficult to attribute the cause of lack of value relevance to either of these two qualitative characteristics. The same notion is found in Barth (2000:17): *"It is often difficult to distinguish relevance and reliability. For an accounting amount to be value-relevant, it must be relevant to investors and sufficiently reliable to be reflected in the value measure, i.e. share price. Failure to detect a significant relation between the amount and the equity value could be attributable to lack of relevance, lack of reliability, or both. However, in some cases relevance is a maintained assumption and failure to find that the item is significantly associated with value is attributed to lack of reliability."* Following Barth (2000), Wyatt (2008:217-8) argues that value relevance provides evidence of relevance and to some extent reliability: *"(...) if the information items of interest are significantly associated with the information set that was used by investors to value the company, we can infer that information as relevant (...). This statistical association with stock price also suggests that information is reliable enough to be value-relevant."*

The close relation between value relevance and the quality characteristic, relevance, is also prominent in the discussion of Francis and Schipper (1999). In their article they are concerned with the decline in value relevance over the past decades. They emphasise that there is a close relation between value relevance and relevance as a qualitative characteristic of accounting information: *"If the relevance of financial statement information has declined over time, we expect to observe a decline in its ability to explain the cross-sectional variation in security returns. Relatedly, following research which models the market price of equity as a function of asset and liability book values, we expect that if the relevance of balance sheet information has declined over time, the ability of these variables to explain market equity will also decline"* (Francis and Schipper 1999:321).

An accounting number is considered to be relevant if it has predictive value and/or feedback value and timeliness. Given semi-strong market efficiency, stock prices will reflect all information available in the public domain concerning the firms' future prospects. This suggests that a value-relevant accounting number will have predictive value. It is, however, less clear whether value relevance demonstrates feedback value. To have feedback value the accounting number must reflect backward-looking rather than forward-looking information.

The last element of relevance is timeliness. Some researchers question the extent to which value relevance demonstrates timeliness (Beaver 2002, Hitz 2007). Timeliness is claimed not to be of particular concern in value-relevance studies (Beaver 2002). This is true when price-levels regressions are employed to investigate the long-term associations between accounting numbers and stock prices. Such a research design will provide evidence on the accounting numbers' ability to summarise information that is reflected in stock prices. When return regressions rather than price-level regressions are employed, significant associations between accounting numbers and stock returns will indicate both value relevance and timeliness (Barth et al. 2001). For instance, a significant negative association between goodwill-impairment losses and contemporaneous stock returns suggests that these losses are value relevant and timely reported. Timeliness can also be investigated by testing the long-term association between accounting numbers and led/lagged stock return (e.g. Chen, Kohlbeck and Warfield 2004). Short-term event studies, however, have timeliness as primary focus. These studies investigate whether accounting numbers reflect new, relevant and thereby timely information to the capital market (Barth 2000, Beaver 2002).

This suggests that value-relevance studies are appropriate to investigate the relevance of accounting information. But it is more debatable whether they provide evidence on reliability. Some researchers claim that they do. For instance, Barth et al. (2001:81) state that *"[r]ejecting the null of no significance (...) is interpreted as evidence that the accounting amount is relevant and not totally unreliable."* In earlier value-relevance research somewhat stronger confidence was placed on the test of reliability. The study by Barth and Clinch (1996) may serve as an example. They conduct an international comparison study where they investigate the value relevance of alternative accounting methods for a set of controversial issues in financial accounting, among these accounting for goodwill and asset revaluations. When discussing the test of reliability, they state that *"(...) even if the economic construct purportedly represented by an accounting measure is relevant to investors in valuing firms' equity, it will not be reflected in share prices or returns if it is not sufficiently reliable. Consequently, observing estimated coefficients that differ from our expectations can be interpreted as evidence for the measures' reliability"* (Barth and Clinch 1996:137). Similar arguments are found in the concluding section of the article: "*UK revaluations are not positively correlated with information investors' use in setting share prices. Because we expect revalued amounts to be value relevant, these findings suggest that revalued amounts are unreliable, perhaps attributed to management discretion over timing, estimated amounts, and which assets to revalue"* (Barth and Clinch 1996:141). This shows strong beliefs that this research provides evidence on relevance and reliability. Others, however, argue that little can be learned from value-relevance studies when it comes to reliability in accounting numbers (Holthausen and Watts 2001, Dahmash, Durand and Watson 2009).

Reliability consists of three elements: verifiability, faithful representation and neutrality. Holthausen and Watts (2001) claim that value-relevance studies pay no attention to verifiability and thereby reliability. Verifiability is an assurance for the users that the accounting information represents what it purports to represent. In value-relevance studies, however, reliability is tested and interpreted as faithful representation. The way value relevance is tested supports this argument. Given sufficient market efficiency, stock prices are supposed to reflect information about expected future net cash flows. A significant association between accounting numbers and these stock prices suggests that accounting numbers faithfully depict these expected cash flows. Verifiability is not a necessary condition for faithful representation and, therefore, not part of the value-relevance test.

A direct test of verifiability is difficult to establish. Wyatt (2008:223) suggests that a comparison of *"(...) the regression coefficient for the (...) item with the size of the coefficient for more reliable assets"* might be a proper way to examine reliability. The higher the coefficient, the more reliable is the accounting number. This does not seem to solve the problem, namely to distinguish relevance and reliability and to address verifiability. A higher coefficient could be interpreted as understated net earnings or net-asset values, which is inconsistent with reliability (e.g. Jennings, Simko, Thompson II 1996, Dahmash et al. 2009). Other studies address the issue of reliability by examining the extent to which the regression coefficient of the accounting number differs from its theoretical coefficient of -1 or +1 (e.g. Landsman 1986, Barth, Beaver and Landsman 1992, Barth and Clinch 1996, Easton 1998, Dahmash et al. 2009). In these studies, rejecting the null hypothesis that the empirical and theoretical coefficients are the same is interpreted as evidence that the accounting number of interest fails to reflect the characteristics of the economic fundamentals. For instance, Dahmash et al.

(2009:121) state that when *"(...) a coefficient is significantly less than or greater than "1", we assume the asset is reported with bias and, therefore not reliably reported."* These studies, however, test faithful representation rather than verifiability.

This suggests that the value-relevance methodology offers insufficient tests of verifiability and thereby reliability. Holthausen and Watts (2001:28) stress this in particular and argue that the *"(...) failure to consider the potential of verifiability of the numbers in value-relevance studies could lead to misleading results."* Higher degree of verifiability is supposed to prevent misrepresentation due to earnings management. As stated by Holhausen and Watts (2001:30): *"Misrepresentation in financial statements occurs because the management responsible for preparing the statements has better information than both the auditor and the investors and has an incentive to misrepresent."* This highlights the importance to look for other factors that may influence the degree of misrepresentation and to include additional test designs that investigate the importance of these factors. This is particularly important for highly discretionary items such as goodwill-impairment losses. Obvious candidates are earnings-management incentives and corporate-governance mechanisms. These are supposed to have opposite effects on the degree of misrepresentation. As earnings-management incentives are supposed to increase the likelihood of misrepresentation, efficient corporate-governance mechanisms are supposed to reduce misrepresentation. Both are carefully discussed in chapter four.

3.3. Value relevance – assumptions and test design

As stated previously, value-relevance research investigates the relationship between accounting numbers and stock prices (Barth 2000, Barth et al. 2001, Fung, Su and Zhu 2010). This relationship is expressed in table 3.1 below:

Table 3.1 Value relevance – formal expressions

$$MV = \phi(AI) + \varepsilon_1$$
$$R = \rho(AI) + \varepsilon_2$$

where

MV	=	Market price of equity.
R	=	Market return on equity.
AI	=	Accounting number.
ε_m	=	Residual term of equation m where $m \in [1,2]$.

A demonstrated association between accounting numbers and stock prices is interpreted as evidence of accounting numbers capturing and summarising economic fundamentals reflected in stock prices. A typical long-term association study investigates the association between goodwill-impairment losses and stock prices. A demonstrated negative association suggests that reported losses capture economic impairment reflected in stock prices. No assumption, however, is made about causality (Lev 1989, Kothari 2001, Scott 2012:160-1). Thus, a significant association should not be interpreted as these losses have *affected* the market perception of the firm. Rather, it suggests that these losses are associated with economic impairment already reflected in these stock prices. This distinguishes long-term value relevance studies from event studies. In event studies the assumption of causality is essential. In short-term event studies, often referred to as short-term information content studies, the causality is ensured by investigating abnormal stock returns and/or changes in trading volume in narrow windows centred on the announcement day. Significant abnormal returns and/or changes in trading volume are interpreted as new and relevant information affecting stock prices. In long-term event studies, however, causality is far more difficult to establish. Demonstrated abnormal returns over one up to five years subsequent to an event will potentially be affected by other price-relevant information (Kothari 2001). Clearly, two elements are needed in a value-relevance study: A benchmark believed to reflect economic fundamentals to assess the usefulness of accounting numbers for equity valuation, and a model which maps the accounting numbers to this benchmark (Barth 2000, Barth et al. 2001, Holthausen and Watts 2001). The benchmark is generally the firm's stock prices or stock returns (Barth 2000). The following sections discuss the assumption of market efficiency and the theoretical models used as reference when constructing value-relevance regressions.

3.3.1.The assumption of market efficiency

There are two perspectives on the role of financial accounting as an information provider in value-relevance research: the information perspective and the measurement perspective. The information perspective considers financial statements as one of numerous sources of price-relevant information that are quickly and fully reflected in stock prices. This perspective is based on the assumption of semi-strongly efficient stock markets. The more information is reported in financial statements, the better. Whether the information is reported in the profit and loss account, in the balance sheet or as additional disclosure is irrelevant as long as sufficient information is reported to uncover its economic implications (Barth 2000, Liang 2001, Hitz 2007).

The measurement perspective is motivated by research findings suggesting that the capital market is less than semi-strongly efficient. In this perspective, accounting becomes even more important than in the information perspective. Accounting information is now considered as numerical inputs in valuation models (Hitz 2007). The fundamental notion underlying this perspective is that accounting should directly measure and report the basic information required by investors for equity valuation, which is fair-value estimates of assets and liabilities (Barth 2000, Liang 2001, Hitz 2007). As studies under the information perspective investigate how well accounting numbers summarise and capture information that might be available from other sources, the measurement perspective will investigate how accurately reported assets and liabilities reflect their economic counterparts. This may lead to different predictions. Taking the information perspective, a typical hypothesis will be that the associations between accounting numbers and stock prices are significantly different from zero. Assets are predicted to have significantly positive coefficients, whereas liabilities are predicted to have significantly negative coefficients (Barth 2000, Holthausen and Watts 2001). Under the measurement perspective, the coefficients on assets and liabilities are generally predicted to equal +1 and -1, respectively (Barth 2000, Holthausen and Watts 2001).

In both perspectives, the value-relevance methodology needs to be based on a certain degree of market efficiency (Lev 1989, Barth et al. 2001, Holthausen and Watts 2001, Wyatt 2008, Fung et al. 2010). Holthausen and Watts (2001:18) argue that *"(...) it is necessary for all the [value relevance] studies to assume at least that capital markets are reasonably efficient. Otherwise the variables reflected in stock prices would not be good estimates of variables of interests or good benchmarks of standard setting."* There is at least one concern that must be paid attention to in relation to market efficiency and value-relevance research. Mounting evidence suggests that the capital markets are inefficient. This leads to several important questions: Which implications does market inefficiency have for value-relevance research? Is it possible to relax the assumption of semi-strong market efficiency? Are there any adjustments to stock prices that could potentially correct for inefficiency, and are there other candidates than stock prices that can serve as proxy for economic fundamentals? The evidence on market efficiency and the consequences of lack of market efficiency for value-relevance research are discussed below.

3.3.1.1. Empirical findings on market efficiency

Capital-market efficiency implies that price-relevant information is quickly and fully reflected in stock prices. The market-efficiency theory is based on the mechanisms and forces of arbitrage. If a piece of price-relevant information is not yet incorporated in the current stock price, there will be powerful economic incentives to uncover it and to trade on it. Consequently, the stock price will adjust until it fully reflects all available price-relevant information. This implies that capital markets might be efficient to some information systems, but not to others (Fama 1970, Ball 1972, Beaver 1998). Market efficiency should, therefore, be assessed for a given set of available information. For instance, the capital market may well be efficient when it comes to immediate reflection of price-relevant *accounting* information. But the market may be inefficient when it comes to private information (i.e. insider information). Fama (1970) classifies market efficiency in three different forms: weak, semi-strong and strong. If the capital market is strongly efficient, which is an unrealistic assumption, all information, even private information held by the managers, is reflected in stock prices. All information is already in the public domain. Thus, there is no information asymmetry, and thereby, no need for accounting (Ronen 1974, Bromvich 1977, Barth and Landsman 1995, Field et al. 2001). If the capital market is semi-strongly efficient, however, financial statements become an important low-cost provider of information. Under semi-strong efficiency, all *publicly* available information, including financial-accounting information, is reflected in stock prices. The more private information that is made publicly available, e.g. through financial statements, the more information is reflected in stock prices (Beaver 2002).

Market-efficiency tests found in the accounting literature fall into two categories: event studies and cross-sectional tests of return predictability (Kothari 2001). These studies provide tests of semi-strong market efficiency. Event studies comprise short-term and long-term event studies. These studies investigate abnormal returns over narrow windows surrounding the event (short-term event studies) or over longer periods following the event (long-term event studies). The investigated events could be earnings announcements, dividend announcements, announcements of restructuring or merger plans or announced changes in accounting methods. Cross-sectional tests of return predictability investigate whether accounting-based trading rules can be used to form portfolios of stocks that perform abnormal returns. Such tests generally use accrual measures or market-to-book ratios to form these portfolios (Kothari 2001, Beaver 2002). Both lines of literature are discussed briefly below. Other literature investigating capital-market efficiency may also be relevant. Still, the primary concern is whether the capital market is efficient when it comes to reflecting accounting information; not information from other sources than the financial statement.

Short-term event studies provide joint tests of information content and market efficiency. Given price-relevant information, event studies bring evidence on the impact, speed and unbiasedness of the market reaction to that information. Strong evidence is found for quick and unbiased market responses to earnings announcements, merger and restructuring announcements and dividend announcements (Kothari 2001). Still, these studies do have some methodological challenges. An important issue is to ensure that the event, for instance the earnings announcement, is not published simultaneously with other announcements (Lev 1989). This may confound the association between the short-window abnormal return and the event. The second issue is to identify the day on which the information is actually revealed to the capital market. To avoid missing the actual day, the return window is usually set equal to a few days centred on the announcement day.

The evidence from short-term event studies supports semi-strong market efficiency (Kothari 2001). The studies by Lee (1992) and Landsman and Maydew (2002) may serve as illustrative examples. Lee (1992) uses intra-day returns and trading-volume data to investigate the market reactions to earnings announcements. He reports a statistically significant price reaction of the same sign as the earnings surprise within 30 minutes of the earnings announcement. No statistically discernible price effect is discovered afterwards. The shift in trading volume is also short-lived: less than two hours for large trades and a few hours for small trades. Landsman and Maydew (2002) investigate the market reactions to earnings announcements over three decades. They find that stock-return volatility and trading volume are significantly larger on earnings-announcement days and that the activity reverts to normal immediately afterwards.

Long-term event studies generally investigate post-announcement drifts in stock returns following an event. There are several potential reasons for the post-announcement drift. Likely candidates are economic irrationality among the investors and market frictions. A post-announcement drift can be defined as the predictability of abnormal returns following certain events (Kothari 2001). Numbers of studies have demonstrated large abnormal returns following well-published events such as earnings announcements, initial public offerings (IOPs), seasoned public offerings (SPOs) and analysts' long-term forecasts (Kothari 2001). These findings seriously challenge the market-efficiency hypothesis. Post-announcement drift is found to have the same sign as unexpected earnings in earnings announcements. This has led to the general conclusion that capital markets underreact to earnings announcements.

Important seminal articles discussing post-announcement drift are Rendleman, Jones and Latane (1987), Freeman and Tse (1989) and Bernard and Thomas (1989, 1990). Bernard and Thomas (1989) investigate the post-announcement drift in changes in quarterly earnings. Earnings surprises are calculated as the difference between earnings for a given quarter one year and earnings of the same quarter the previous year. They demonstrate that buying stocks in firms reporting surprisingly high quarterly earnings, selling short stocks in firms reporting surprisingly low quarterly earnings and holding this position for 60 days following the announcement, will give a significantly high abnormal return. As Bernard and Thomas (1989) point out, it is a wellknown fact that quarterly-seasonal earnings changes are positively correlated. Thus, if a firm reports surprisingly high earnings this quarter compared to the same quarter last year, it is likely that its future quarter earnings will be surprisingly high as well. Rational investors should anticipate this and be willing to bid up the price of the firms' stocks in response to surprisingly high quarterly earnings, but Bernard and Thomas (1989) find that this is not the case. These findings suggest that the capital market underestimates the positive correlation between quarterly earnings changes (Bernard and Thomas 1989, 1990, Ball and Bartov 1996). Surprisingly, the post-announcement drift has not disappeared even several decades after its first discovery (e.g. Narayanamoorhy 2006). Later studies, however, have found that the significance of the announcement drift varies according to certain characteristics of the firms and the capital market. Bhushan (1994) for instance, demonstrates that the post-announcement drift is mainly driven by relatively smaller firms, firms with stocks having relatively larger bid-ask spreads, stocks that are less frequently traded and less closely followed by analysts. Other studies report evidence suggesting that the post-announcement drift is less strong in firms having more institutional ownership (Bartov, Radhakrisknan and Krinsky 2000) and more timely analysts' forecast revisions (Zhang 2008). This last finding is consistent with Bhushan (1994). The results for short-term and long-term event studies are puzzling. The short-term event studies demonstrate evidence consistent with market efficiency. In constrast, the long-term event studies suggest the opposite that price-relevant information is reflected in stock prices with substantial time lag following the events. This last evidence is inconsistent with market efficiency (Beaver 2002).

One potential reason for these contradicting results is different methodology. Long-term event studies are believed to suffer from more serious methodological problems than short-term event studies. Likely problems in long-term event studies are omitted variables and survivorship bias (Lev 1989, Kothari 2001). Post-announcement drifts could be due to an omitted priced risk factor. The omission of this risk factor will affect the estimate of expected return and thereby the estimate of abnormal return. Thus, the post-announcement drift could be the result of an under or misspecified return model rather than evidence of market inefficiency (Kothari 2001). In contrast, short-term event studies are believed to suffer from fewer problems of misestimated expected returns (e.g. Brown and Warner 1985). Common expected return in short-term event studies is about 0.05% per day. The misestimation of expected return due to risk mismeasurement is likely to be less than 0.01-0.02% per day. This is small compared to a common abnormal return of 0.5% in these studies (Kothari 2001). Due to fewer methodological problems, more confidence can be placed on the evidence from short-term event studies than the evidence from long-term event studies. Despite this, there is no doubt that the mounting evidence on the post-announcement drift still represents a serious challenge to the market-efficiency hypothesis.

A different line of literature investigates market responses to accounting-method changes. These studies are similar to the event studies in that they investigate the market response to a certain event, in this case, change in accounting methods. The accounting-method changes have no (apparent) cash-flow effects. An efficient capital market is, therefore, predicted not to be misled by its effects on net earnings and net-asset values. Thus, no market response to accounting-method changes is consistent with an efficient capital market (Watts and Zimmerman 1986:72, 1990, Beaver 1998: 135, Kothari et al. 2010). These tests, however, are problematic. Changes in accounting methods are not exogenous, but endogenous. A voluntary change in accounting methods could reflect opportunistic reporting incentives or signalling incentives. Likewise, a mandatory change in accounting methods could be the result of lobbying effort of different interest groups (Watts and Zimmerman 1986). For instance, the decision to capitalise research and development costs could be driven by the desire to affect the outcomes of earnings-based compensation contracts. Alternatively, capitalisation might signal that the research and development activity is expected to provide economic benefits. This suggests that accounting-method changes might have cash-flow effects. Early studies, however, report findings consistent with market efficiency. Ball (1972), for instance, investigates accounting changes in net earnings and reports no significant market response to these changes, which is consistent with market efficiency. Likewise, Beaver and Duke (1973) find no significant market response to changes in depreciation methods. Some later evidence is inconsistent with the market-efficiency hypothesis. For instance, capital markets are not found to be able to undo the effects on net earnings when firms choose between pooling and purchase accounting. Vincent (1997) compares price-earnings ratios of firms using the pooling-of-interests method with those using the purchase method for business combinations. The earnings numbers of the pooling-method firms are restated as if these firms used the purchase method. She finds that the price-earnings ratios of the pooling-method firms are higher than those for purchase-method firms, suggesting that firms using the purchase method are placed at a disadvantage. Taken together, the results on accounting-method changes and market efficiency are somewhat mixed and inconclusive (Kothari 2001).

The evidence on market responses to accounting accruals is mainly found to be inconsistent with market efficiency. These studies are not considered as event studies. Rather, they are investigating cross-sectional predictability of abnormal returns without addressing particular events (Kothari 2001). Sloan (1996) is an important seminal study in this line of literature. Net earnings consist of cash flows and net accruals. The cash-flow component is found to be more persistent and less likely to be incurred by measurement errors than the accrual component in net earnings. Since accruals are less persistent and more subject to measurement errors than cash flows, the capital market is predicted to respond more strongly to changes in earnings caused by the cash-flow component in earnings than the accrual component. Sloan (1996) reports evidence inconsistent with these predictions. Rather, the evidence suggests that the capital market overestimates the persistence of accruals and underestimates the persistence of cash flows. This questions whether the capital market effectively distinguishes high from low quality earnings. Lev and Nissim (2006) report evidence consistent with Sloan (1996), but they conclude that the accrual anomaly is less severe for firms having institutional investors. In contrast, Kraft, Leone and Wasley (2007) report evidence inconsistent with Sloan (1996) and Lev and Nissim (2006). They add variables such as capital expenditures to the analysis and find that the mispricing of accruals disappears. A recent survey by Kothari et al. (2010) questions whether prior research findings can reject the market-efficiency hypothesis. They conclude that an overwhelming body of evidence suggests that stock prices largely anticipate the economic substance of the information in financial statements. They argue that *"(...) the evidence of market inefficiency is much like waves over deep sea waters – the tranquillity of deep waters underneath swamps any indication of turbulence from waves on the top"* (Kothari et al 2010:278). Still, it is reasonable to question whether the capital markets are efficient.

3.3.1.2.Market efficiency and value-relevance methodology

The evidence against capital-market efficiency may have serious implications for value-relevance research. Lee (2001) argues that a naïve assumption of strong market efficiency, in which stock price is assumed to equal fundamental value, is an inadequate conceptual starting point for future market-related research. According to Lee (2001), it is an over-simplification that fails to capture the richness of market-pricing dynamics and the process of price discovery. Instead, he suggests that the market-efficiency puzzle should be seen as a fruitful way for further research. For instance, he suggests that researchers within the value-relevance area should derive independent measures of fundamental value, rather than assume market efficiency.

The study by Aboody, Hughes and Liu (2002) is motivated by Lee (2001). They examine the extent to which measures of value relevance are affected by market inefficiency. First, they examine analytically the impact of market inefficiency on the estimation of the coefficients in value-relevance regressions and derive an adjustment procedure that potentially corrects bias caused by this inefficiency. The procedure adjusts current stock prices for future risk-adjusted stock-price changes and provides value-relevance estimates that capture both current and delayed market reactions. Delayed market reactions may occur if the market is inefficient. Second, they apply this procedure on three types of studies that have attracted much attention. Studies which investigate value relevance of earnings and book values, value relevance of residual-income estimates and value relevance of accruals and cash flows. The procedure adjusts current stock price with the ratio of one plus the actual stock return to one plus the required rate of stock return, both measured in the future period τ where τ is set equal to 12, 24 or 36 months. Significant differences are found when comparing results from conventional value-relevance regressions with those regressions with adjusted stock price. Specifically, they report that regression coefficients on both earnings and book equity value increase significantly when employing the adjustment procedure.

Other recent studies try to develop a measure of fundamental value (Subramanyam and Venkatachalam 2007, Fung et al. 2010). For instance, Subramanyam and Venkatachalam (2007) develop a model for estimating fundamental values based on the dividend-discount model. Their model measures fundamental value as the sum of the present value of dividends for the next three years and the present value of stock price in three years. Fung et al. (2010) employ this measure and investigate the difference between stock prices and these estimates of fundamental value. The difference is found to increase over time and in proxies for noise trading and information uncertainty. The difference, however, is less serious for larger firms. They investigate the demonstrated decline in value relevance reported in prior studies (e.g. Lev and Zarowin 1999, Francis and Schipper 1999). When they replace the stock price with the measure of fundamental value, they do not find that the associations between this measure and accounting numbers have declined. Instead, they argue that the decline in value relevance found in prior studies is evidence of stock pricing becoming a worsening measure of firms' fundamental value over time.

These studies demonstrate some compelling evidence. Still, there are reasons why stock prices might be preferable to these alternative measures of fundamental value. First, these alternative measures have not become standard in recent value-relevance research. A number of recent value-relevance studies has not employed this adjustment procedure (e.g. Barth, Landsman and Lang 2008, Kumar and Krishnan 2008, Jifri and Citron 2009, Kang and Zhao 2010, Song et al. 2010), even though there are exceptions (e.g. Gjerde, Knivsflå and Sættem 2008, 2011, Fung et al. 2010). Second, these measures might suffer from measurement errors. There are two alternative explanations of the improved associations between these measures of fundamental value (e.g. Aboody et al. 2002, Subramanyam and Venkatachalam 2007) and accounting numbers. It could be that these measures are better at reflecting fundamental value as advocated by Aboody et al. (2002), Subramanyam and Venkatachalam (2007) and Fung et al. (2010). Alternatively, it could be that these measures are better at reflecting accounting numbers. The "true" fundamental value is unobservable, which suggests that these measures reflect the fundamental value with some unknown error. Thus, the validity of these measures might be open to question.

However, the assumption of market efficiency in value-relevance studies might be met in other ways. One possibility is to let the assumption of market efficiency influence the sample-selection process. The following procedure might be appropriate: First, choose a stock market which is supposed to be liquid and informational efficient, e.g. the London Stock Exchange, and second, select those firms on this stock market which are supposed to have the most liquid and informational efficient stock prices. These firms are generally those with the highest market capitalization (for instance, firms included in the FTSE-100 index or the FTSE-350 index) (e.g. Fung et al. 2010). There is also possible to use other benchmarks than adjusted or non-adjusted stock prices and estimates of fundamental values in value-relevance studies. Two examples are analysts' forecasts and managements' forecasts. It is debatable, however, whether these proxies are better at reflecting fundamental value than stock prices.

There are some researchers, however, that question whether market efficiency is a necessary assumption. For instance, Barth (2000), Barth et al. (2001) and Dahmash et al. (2009) argue that value-relevance studies do not need to assume market efficiency. They do admit, however, that market efficiency will provide a more powerful test as it makes it possible to examine the extent to which accounting numbers reflect economic fundamentals. Still, it is not necessary to assume that stock prices are "true" and unbiased measures of fundamental values. Such "true" measures are unobservable and therefore unattainable. Holthausen and Watts (2001), however, argue that associations with inefficient market prices provide no standard-setting implications: *"(...) if the stock market was inefficient* *and the estimates of the market value of investment securities implicit in stock price were poor, why would the FASB want to use those implicit values?"* (Holthausen and Watts 2001:18)

The importance of market efficiency is also a question of the chosen perspective and methodology. There is a distinction between studies under the information perspective and the measurement perspective. Under the measurement perspective, the coefficients are generally predicted to equal some valuation weight, typically +1 for assets and -1 for liabilities. In these studies the accounting numbers of assets and liabilities are supposed to measure economic assets and liabilities. This makes the assumption of market efficiency particularly important. In fact, these studies need to assume that the capital market is close to being perfect and complete, which subsumes strong market efficiency (Holthausen and Watts 2001). If this is the case, there is literally no need for accounting. Under the information perspective, it is claimed to be sufficient to assume that stock prices reflect investors' consensus beliefs (Barth 2000, Barth et al. 2001, Dahmash et al. 2009). This seems only to be the case for long-term association studies, not short-term event studies. Long-term association studies typically investigate the association between accounting information and stock prices over longer periods of time. Short-term event studies, however, investigate changes in stock prices or trading volume in narrow windows centred on the announcement day. Thus, the maintained hypothesis in short-term event studies has to be that the capital market is informationally efficient in the sense that stock prices quickly and fully reflect the revealed information (Lev 1989, Kothari 2001). As stated in the previous section, these studies are in fact joint tests of information content and market efficiency.

3.3.2. Valuation models

The value relevance-methodology requires a model that specifies a link between the benchmark variable, stock prices or stock returns, and the accounting numbers. Three different valuation models are discussed in this section: the earnings model, the balance-sheet model and the combined earnings-and-balance sheet model referred to as the Ohlson model (Holthausen and Watts 2001). The above valuation models are chosen because they are frequently used as justification for regression models employed in value-relevance studies. Other accounting-based valuation models could be relevant, but these models are generally restricted versions of the above three models (Dechow, Hutton and Sloan 1999). All the models are derived (or can be derived) from the basic dividend-discount model under the assumption of perfect and complete markets (Kothari and Zimmerman 1995, Lo and Lys 2000, Barth 2000). Such market settings imply no information asymmetry and no need for accounting (Barth et al. 2001, Holthausen and Watts 2001, Field et al. 2001). According to Barth et al. (2001), this does not preclude, however, the use of these models to assess the value relevance of accounting information.

3.3.2.1. Earnings model

The earnings model (or earnings-capitalisation model) is derived on assumptions of perfect and complete markets. The discount rates are assumed to be constant across firms and across time (Kothari and Zimmerman 1995, Barth 2000). Given no uncertainty, fair-value accounting and no dividends, current year's net earnings will equal the beginning of the year's equity times the discount rate which is perfectly the same as the current year's changes in equity values. Given uncertainty, current year's net earnings will equal expected net earnings adjusted for current year's unexpected earnings (Barth and Landsman 1995). Perfect and complete markets imply that the dividend policy has no wealth effects for shareholders (Miller and Modigliani 1961). They can simply invest the dividends and obtain the same rate of return as the firm. But, the dividend policy will obviously have implications for the firm's growth in earnings and equity. The earnings model is generally specified as a non-growth model (Ohlson 1995, Lundholm 1995, Kothari and Zimmerman 1995, Kothari 2001). This implies that current year's earnings equal current year's dividends. Given random walk in net earnings and no reinvestment, expected net earnings will be equal for all years. With an unlimited time-horizon, this yields a very simple model where current year's net earnings divided by the discount rate equal the market value of equity (notation from Barth 2000:12):

Table 3.2 Earnings model

$$MV_t = \frac{X_t^*}{r}$$

where

MV_t	=	Market value of equity, time *t*.
X_t^*	=	Net earnings, period *t*.
r	=	Discount rate.[9]

The assumptions of this model are obviously violated in a real market setting. No markets are perfect and complete. This will, for instance, have implications for the discount rate. Under imperfect and incomplete market settings, the discount rate will generally vary across firms and across time (Kothari and Zimmerman 1995, Lo and Lys 2000, Barth 2000). This makes it important to consider the

[9] If future net earnings are uncertain (assume random walk) and investors are risk-averse, the discount rate should be risk-adjusted.

determinants of the discount rate such as risk and growth in empirical applications of this model (Barth 2000).

The earnings model is also based on unrealistic assumptions regarding the time-series properties of net earnings (Lev 1989, Kothari and Zimmerman 1995, Barth 2000, Kothari 2001, Holthausen and Watts 2001). The common assumption is that reported net earnings proxy for permanent earnings (e.g. Miller and Modigliani 1966, Lev 1989, Barth 2000, Holthausen and Watts 2001). This assumption implies that net earnings are equal in all future reporting periods, which is highly unrealistic. Both transitory and permanent earnings components will be part of net earnings for a given year, which makes it crucial to determine which earnings components in net earnings may or may not reflect permanent earnings (Barth 2000). For instance, prior literature has found that the market response varies with the persistence of the earnings components (e.g Ramakrishnan and Thomas 1998). However, the exercise of adjusting net earnings to reflect permanent earnings will be rather arbitrary and will most likely fail (Holthausen and Watts 2001). Net earnings are not intended to reflect permanent earnings and there are only a few cases in which a clear distinction is made between one-time gains and losses and more permanent earnings components (Holthausen and Watts 2001).

An alternative assumption is that net earnings follow a random walk (Lev 1989, Kothari and Zimmerman 1995, Kothari 2001). This assumption allows net earnings to be a stochastic zero-mean variable. Any deviation in actual net earnings from expected net earnings will be non-persistent. Moreover, since actual net earnings are paid out in dividends, net earnings the current year will not affect next year's expected net earnings. The assumption of no growth (no reinvestment) will ensure that expected net earnings will be equal across reporting periods.

Empirical evidence, however, has demonstrated that net earnings are intertemporally correlated, which is inconsistent with the random-walk assumption (Kothari 2001). The empirical counterpart of the above earnings model is given in table 3.3 below:

Table 3.3 Price-earnings regression

$$P_{i,t} = \alpha_0 + \alpha_1 X_{i,t} + \varepsilon_{i,t}$$

where

$P_{i,t}$	=	Stock price of firm *i*, time *t*.
$X_{i,t}$	=	Earnings-per-share of firm *i*, period *t*.
$\varepsilon_{i,t}$	=	Residual of firm *i*, time *t*.

The coefficient α_1 is the monetary unit change in stock price in response to one monetary unit change in earnings-per-share, which equals the basic price-earnings ratio (Kothari and Zimmerman 1995). Under the measurement perspective, the coefficient of net earnings is expected to be equal to 1/*r* where *r* is the discount rate (Kothari and Zimmerman 1995, Holthausen and Watts 2001, Kothari 2001). Predicting the size of the coefficient, however, is generally impossible for several reasons. A violation of the assumptions of perfect and complete markets and a violation of the assumed time-series properties of net earnings will obviously lead to an estimated coefficient which differs from 1/*r* (Kothari and Zimmerman 1995, Kothari 2001). There are also other reasons why the coefficient on net earnings will deviate from 1/*r*. The earnings model is based on the assumption that reported net earnings equal economic earnings. Current year's economic earnings are calculated as current year's changes in net present values. In a realistic accounting setting, however, net earnings will equal current year's net cash flows adjusted for current year's net accruals (Dechow and Dichev 2002). These accruals will generally not be based on changes in present values. They will be a mixed product of modified historical-cost accounting on the one hand, and thereby, principles for revenue recognition, matching and prudence, and fair-value accounting on the other. The prices-lead-earnings phenomenon could be explained by the accrual process. Given sufficient market efficiency, it is expected that stock prices will quickly and fully incorporate changes in net present values. Due to principles for revenue recognition and prudence, however, net earnings generally reflect stock-price changes with time lags (e.g. Beaver 1980, Lev 1989, Kothari 2001). Under the information perspective, however, no predictions are made regarding the size of the earnings coefficient, only that the coefficient is significant positive.

The price-earnings model is typically employed in relative-association studies and incremental-association studies (Holthausen and Watts 2001). In relative-association studies, stock prices are regressed on alternative measures of earnings. The measure whose regression has the highest explanatory power is considered the best earnings measure or most value-relevant earnings measure. For instance, the study by Jennings et al. (2001) is a typical relative association study using the earnings model as basis for the regression specification. They test whether earnings before goodwill-amortisation charges have higher value relevance measured by R-square than earnings after goodwill-amortisation charges. In incremental-association studies, however, the stock price is regressed on components of earnings. Jennings et al. (1996a) for instance, employ an incremental-association design to examine the associations between stock prices and different components of earnings such as earnings before goodwill amortisation, goodwill-amortisation charges and other depreciation charges.

The earnings model is often specified in changes rather than levels form. Given clean surplus accounting, current year's earnings will equal changes in book equity values and net dividends. This suggests that the price-earnings regression can be specified as a return-earnings regression. The simplest version of the return-earnings model is specified in table 3.4 below:

Table 3.4 Return-earnings regression

$$R_{i,t} = \beta_0 + \beta_1 X_{i,t} + \varepsilon_{i,t}$$

where

$R_{i,t}$	=	Stock return of firm *i*, period *t*.
$X_{i,t}$	=	Earnings of firm *i*, period *t* (scaled by stock price, time *t-1*)
$\varepsilon_{i,t}$	=	Residual of firm *i*, time *t*.

This regression has been extensively investigated in prior literature. The coefficient of earnings, β_1, is often referred to as the earnings-response coefficient (Kothari 2001). This coefficient reflects the change in stock returns for a given change in earnings. Value-relevance researchers frequently focus on the association between abnormal stock returns and some measure of abnormal earnings. The coefficient on abnormal earnings is also referred to as the earnings-response coefficient (Lev 1989, Scott 2012:163). Abnormal stock returns are estimated by deducting expected stock returns from raw stock returns. An estimate of expected stock returns can be obtained in a number of ways, for instance by using the market model with theoretical reference to the capital-asset pricing model (CAPM) or the Fama and French three-factor model (Fama and French 1993, 1995, 1996). Abnormal stock returns are regressed on abnormal earnings where the latter are the differences between net earnings and an estimate of expected net earnings. Abnormal earnings could simply be differences between current net earnings and previous year's net earnings assuming a random walk (Lev 1989). In other cases, analysts' forecasts are used as an estimate of expected net earnings (e.g. Kormendi and Lipe 1987, Easton and Zmijewski 1989, Lev 1989, Freeman and Tse 1992). This abnormal return model is employed in short-term as well as long-term event studies (e.g. Kothari 2001). In the long-term event studies the above model is generally employed to investigate post-announcement drifts.

3.3.2.2. Balance-sheet model

Along with the earnings model, the balance-sheet model is one of the simplest when it comes to its specification, but the simplicity is off-set by the strict assumptions of the model. Similar to the above earnings model, the balance-sheet model is based on the assumptions of perfect and complete markets (Barth 2000, Holthausen and Watts 2001). Given these assumptions and fair-value accounting, all relevant information is found on the balance sheet. All assets and liabilities are recognised at their present values which equal their market values. Given no dividends, current year's net earnings equal current year's changes in equity values, which implies that net earnings provide no additional information beyond the information offered by the balance sheet (Barth and Landsman 1995, Scott 2012: 35-45). Thus, the balance-sheet model expresses the market value or the present value of equity as a function of the market values or the present values of the firm's assets and liabilities (Landsman 1986, Barth 1991, Barth 2000, Holthausen and Watts 2001). In contrast to the earnings model, the balance-sheet model is not based on any particular assumption regarding the dividend policy. The model is specified in table 3.5 below (notation from Holthausen and Watts 2001:53):

Table 3.5 Balance-sheet model

$$MV_t = AS_t^* + LI_t^*$$

where

MV_t	=	Market value or present value of equity, time *t*.
AS_t^*	=	Market value or present value of assets, time *t*.
LI_t^*	=	Market value or present value of liabilities, time *t*.

The regression counterpart of this model is based on the same assumptions as the theoretical balance-sheet model. All assets and liabilities should be recognised at their market values or present values. This is certainly not the case in a real setting. Far from all assets and liabilities are recognised on the balance sheet. Obvious examples are internally-generated intangible assets, contingent assets and liabilities and some uncertain provisions. Moreover, the assets and liabilities that are recognised on the balance sheet are generally not reported at their market values or their present values. Rather, they are reported at modified historical cost. Table 3.6 below specifies the empirical version of the balance-sheet model:

Table 3.6 Balance-sheet regression

$$P_{i,t} = \alpha_0 + \alpha_1 AS_{i,t} + \alpha_2 LI_{i,t} + \varepsilon_{i,t}$$

where

$P_{i,t}$	=	Stock price of firm *i*, time *t*.
$AS_{i,t}$	=	Book value of assets per share of firm *i*, time *t*.
$LI_{i,t}$	=	Book value of liabilities per share of firm *i*, time *t*.
$\varepsilon_{i,t}$	=	Residual of firm *i*, time *t*.

This regression is typically employed in incremental-association studies. In these studies asset and liability values are separated from total assets and total liabilities and included as independent variables (Holthausen and Watts 2001). Under the measurement perspective, the coefficients of assets and liabilities are predicted to equal +1 and -1, respectively. Under the information perspective, however, the predictions are relaxed. Reported assets are now predicted to have significantly positive coefficients and reported liabilities significantly negative coefficients (Barth 2000, Holthausen and Watts 2001). No assumptions are made regarding the size of the coefficients. Still, it is necessary to assume that reported asset and liability values are highly positively associated with the economic asset and liability values. To avoid confounding inferences, it is crucial to assess which assets and liabilities are not reported on the balance sheet (Barth 2000). Potential candidates are internally-generated intangible assets. These assets can give rise to abnormal-return opportunities and economic growth. Control variables for growth and industry sectors should, therefore, be included to avoid inference problems due to correlated-omitted variables (Barth et al. 2001, Holthausen and Watts 2001).

3.3.2.3. Feltham-Ohlson and Ohlson model

Ohlson (1995) derives an accounting-based valuation model that includes earnings and equity book value as independent variables. The model provides a link between accounting variables and firm value. The theoretical fundamentals of the Ohlson model are found in the residual-income model known as the Feltham-Ohlson model (Ohlson 1995, Feltham and Ohlson 1995). The Feltham-Ohlson model is specified in table 3.7:

Table 3.7 Feltham-Ohlson model

$$MV_t = Y_t + \sum_{\tau=1}^{\infty} \frac{E\left[X_{t+\tau}^{a}\right]}{(R_k)^{\tau}} = Y_t + \sum_{\tau=1}^{\infty} \frac{E\left[X_t - (R_k - 1)Y_{t-1}\right]}{(R_k)^{\tau}}$$

where

MV_t	=	Market value of equity, time *t*.
Y_t	=	Book value of equity, time *t*.
Y_{t-1}	=	Book value of equity, time *t-1*.
X_t^a	=	Abnormal earnings, period *t*.
X_t	=	Net earnings, period *t*.
R_k	=	Discount factor, one plus the discount rate r.[10]

The model is based on the dividend-discount model with the assumption of clean-surplus accounting and perfect and complete markets (Ohlson 1995). No particular assumption is made regarding the dividend policy. One monetary unit paid out in dividends will reduce next year's expected earnings by the interest that could be earned on that monetary unit (Lundholm 1995). The model does not offer any theory of information or theory on measurement. But it permits a representation of the value of equity in terms of accounting numbers, book-equity value and expected abnormal earnings (Beaver 2002). If additional assumptions regarding the information dynamics of abnormal earnings and non-accounting information are added, the Feltham-Ohlson model can be restated as a model where the market value is explained by current earnings and current book value of equity. Abnormal earnings and non-accounting information are assumed to follow an autoregressive process. Non-accounting information represents additive shocks that are expected to flow through future abnormal earnings. This means that non-accounting information is turned to earnings in the future. The formal derivation of this model

[10] If future abnormal earnings are uncertain and investors are risk-averse, the discount rate should be risk-adjusted.

is shown in appendix C. By adding a parameter for non-accounting information, υ, a parameter, φ, which is a function of the discount rate, and a parameter, k, which is a function of the discount rate and the persistence of abnormal earnings, to the Feltham-Ohlson framework, it is possible to express the relative importance of earnings (X) and book value (Y) as determinants of the market value of equity (Ohlson 1995, Lundholm 1995). This model is specified in table 3.8 below:

Table 3.8 Ohlson model

$$MV_t = k(\varphi X_t - D_t) + (1-k)Y_t + \alpha_2 \upsilon_t$$

where

MV_t	=	Market value of equity, time *t*.
k	=	$(R_k - 1)\alpha_1 = \frac{(R_k - 1)\omega}{(R_k - \omega)}$ where ω is the persistence parameter of earnings; $0 \leq \omega < 1$.
φ	=	$\frac{r}{(1-r)}$ where r is the discount rate .
X_t	=	Net earnings, period *t*.
Y_t	=	Book value of equity, time *t*.
D_t	=	Net dividends, period *t*.
α_2	=	$\frac{R_k}{(R_k - \omega)(R_k - \gamma)}$ where γ is the regression coefficient from the following autoregressive model: $\tilde{\upsilon}_{t+1} = \gamma \upsilon_t + \tilde{\varepsilon}_{t+1}$ where the error term, $\tilde{\varepsilon}$, is a stochastic zero-mean variable.
υ_2	=	Non-accounting price-relevant information, time *t*.

The above model, generally referred to as the Ohlson model, is solely based on earnings and book equity value and other non-accounting price-relevant information as explanatory variables of market value. The parameter φ acts like an earnings multiplier. The parameter, k, is partly determined by the persistence parameter ω. The lower limit of ω, $\omega = 0$, implies $k = 0$. Similarly, the upper limit of ω, $\omega = 1$, implies $k = 1$. The Ohlson model can be seen as a weighted average of an earnings model and a balance-sheet model (e.g. Penman 1998). If the persistent parameter equals 1, $\omega = 1$, the Ohlson model turns into an earnings model. In contrast, if the persistent parameter equals 0, $\omega = 0$, the Ohlson model turns into a balance-sheet model. These information dynamics have been further developed to involve conservatism (Feltham and Ohlson 1996), to distinguish between permanent and transitory components in earnings (Ohlson 1999) and to include additional conditioning variables, for instance, different compositions of earnings such as cash flows and accruals (Barth, Beaver, Hand and Landsman 1999). The above Ohlson model is used as a theoretical justification for the combined earnings and book equity regression models. The empirical version of the Ohlson model is given in table 3.9 below:

Table 3.9 Ohlson regression

$$P_{i,t} = \alpha_0 + \alpha_1 X_{i,t} + \alpha_2 Y_{i,t-1} + \varepsilon_{i,t}$$

where

$P_{i,t}$	=	Stock price of equity of firm *i*, time *t*.
$X_{i,t}$	=	Net earnings-per-share of firm *i*, period *t*.
$Y_{i,t-1}$	=	Book value of equity per share of firm *i*, time *t-1*.
$\varepsilon_{i,t}$	=	Residual of firm *i*, time *t*.

The Ohlson model and its regression counterpart are appealing for value-relevance research because they specify a link between accounting numbers and stock prices. Using the Ohlson model as basis for the regression model adds the assumptions of the Ohlson model to the ordinary-least-square regression assumptions.

3.3.2.4. Criticisms of the Feltham-Ohlson and the Ohlson model

The Feltham-Ohlson model and the Ohlson model are based on the assumption of clean surplus. Earnings must equal the comprehensive income concept which means that all gains and losses for a given period are reported on the profit and loss account. This assumption alone is very weak concerning the properties of the accounting system. The Feltham-Ohlson model specifies two accounting variables, earnings and book equity, but only one time-series assumption: clean surplus. This makes the model nothing but a restatement of the dividend-discount model. Assuming a steam of future dividends, the value of book equity, Y_t, and net earnings, $X_{t+\tau}$, could be picked at random. As long as all future book-equity values, $Y_{t+\tau}$, are calculated according to the clean-surplus assumption, the Feltham-Ohlson model will yield the present value of the future dividends. Seen from an empirical perspective, the Feltham-Ohlson model leaves the researcher in much the same position as the dividend-discount model. The valuation model cannot be applied without estimates of future abnormal earnings, which means that future book values are required. To estimate future book values, the researcher needs to estimate future dividends. But, once future dividends are estimated, book-equity values and earnings numbers become redundant, and the researcher may well use the dividend-discount model instead. Albeit, the Feltham-Ohlson model has intuitive appeal due to its use of earnings and book-equity values instead of dividends, it provides no new empirical implications in and of itself (Dechow et al. 1999, Holthausen and Watts 2001, Kothari 2001).

Lo and Lys (2000) and Bernard (1995) argue that the clean-surplus assumption is a strength of the model. This is true when the model is used for equity-value estimation. Any accounting system meeting the clean-surplus assumption can be used to estimate equity value. But this is not necessarily true when it comes to its applicability in value-relevance research. Value-relevance studies do not use the Feltham-Ohlson model for equity valuation, but as basis for regression models whose purpose is to test the valuation usefulness of accounting numbers (e.g. Barth et al. 2001). Value-relevance research is not motivated by equity valuation per se, but motivated to give standard-setting implications on the valuation usefulness of accounting numbers. The Feltham-Ohlson model does not give any implications for accounting standard-setting as any set of accounting methods meeting the clean-surplus assumption will encompass the model. This suggests that the strength of the model seen from a fundamental-analysis perspective is a limitation when seen from a value-relevance perspective.

This has led researchers to question the use of the Feltham-Ohlson model as justification for value-relevance regressions (Ohlson 1995, Bernard 1995, Holthausen and Watts 2001, Kothari 2001). Barth et al. (2001) acknowledge that the model itself does not give any implications for accounting-method choices. Still, they do not think this undermines the usefulness of the model for standard-setting: *"(...) none of the valuation models explicitly derive an optimal accounting system or even a demand for accounting information, this does not preclude use of such models to assess the value relevance of accounting amounts and to provide insights relevant to standard setters, as HW [Holthausen and Watts] claims"* (Barth et al. (2001:92). In a footnote, Holthausen and Watts (2001:61, footnote 20) give a response to this argument: *"We agree that the model can be used to assess associations between equity value and accounting numbers, but that is not the point we are making. Our point is that the model itself has no implications for accounting methods and provides no direct inferences for accounting standards."* Beaver (2002) claims that the criticism stated by Holthausen and Watts (2001) is misplaced and misdirected. He argues that *"(...) the modelling could be* *informative without including an endogenous demand for accounting. By analogy, the Capital Asset Pricing Model (CAPM) has no demand for financial institutions, yet we observe financial institutions empirically. What do we conclude? Do we conclude that the risk-return trade-off derived from the CAPM is of no interest or relevance to investors or to managers of financial institutions? I think not"* (Beaver 2002:458). The model provides a framework for valuation based on accounting numbers. As Beaver (2002:458) states: *"This framework relates published accounting data to equity valuation (...).With contextual accounting arguments added to the general framework, researchers can predict how accounting numbers would relate to value (...)."*

In order to derive the Ohlson model, additional assumptions regarding the information dynamics are needed to specify the time-series pattern of abnormal earning and non-accounting information. These information dynamics are also essential to the empirical applicability of the model beyond the Feltham-Ohlson model and the dividend-discount model. These additional assumptions make it possible to derive a link between current earnings and book-equity values and future abnormal earnings (Ohlson 1995, Lo and Lys 2000). Dechow et al. (1999) conduct an empirical analysis of the linear dynamics of abnormal earnings. Using a pooled regression of all the firm observations with one period lag, the persistence parameter equals 0.62. The persistence is far from its limits of 0 and 1, suggesting that stock prices are jointly explained by current net earnings and book equity. Thus, neither a balance-sheet model nor an earnings model seems appropriate to explain variation in stock prices. In the second part of the article they examine variables that may affect the persistence of abnormal earnings across firms and over time such as high levels of earnings, extreme accounting rates of return, high operating accruals, high payout ratios of dividends, high levels of non-recurring items and industry-specific factors. The analysis reveals that all the determinants are statistically significant, suggesting that the persistence parameter varies cross-sectionally and time-serially as a result of firm-specific and industry-specific characteristics. Thus, the information dynamics are not completely captured by the simple autoregressive model presented by Ohlson (1995). Lo and Lys (2001), however, argue in the spirit of Roll's critique (Roll 1977) that the test of the Feltham-Ohlson model and the Ohlson model is a joint test of the models' assumptions on the one hand and whether the model is descriptive of the market pricing of stocks on the other. Kothari (2001) takes the same position and concludes that the evidence rejecting the information dynamics is weak.

Other aspects of the Ohlson model also question its applicability. First, the model and its regression counterparts are built on the assumption of linearity. This assumption is generally violated if there are omitted variables which are correlated with the independent variables. Potential candidates are variables affecting the persistence of abnormal earnings. Holthausen and Watts (2001) argue that nonlinearity could be due to growth options, abandonment options and conservatism. For instance, Hayn (1995) investigates the information content of positive and negative earnings. She reports that negative earnings are less informative than positive earnings and maintains that this is due to the abandonment option held by the shareholders. The shareholders can always liquidate the firm rather than suffer from indefinite losses. A similar point is made by Collins, Maydew and Weiss (1997) and Ball and Shivakumar (2006).

Barth et al. (2001) claim that potential nonlinearity problems due to growth options and abandonment options can be handled within the existing Ohlson model. The growth options, termed economic rents in their article, are captured by the persistence parameter of earnings, ω , and the non-accounting information parameter, υ. In the regression counterpart of the Ohlson model the present value of future cash flows not attributed to book equity can be used as a proxy for future growth options. They also claim that intangible assets such as customer lists, brand names and research and development costs are attributable to growth options. These suggestions, however, do not seem to solve the problem addressed by Holthausen and Watts (2001). Expected future cash flows are generally uncertain and unobservable, and any allocation of cash flows between book equity and other net assets not recognised on the balance sheet will most likely be arbitrary. Another way to counter the problem of nonlinearity is to allow the regression coefficients to vary cross-sectionally and time-serially, using a fixed effects regression model. This approach will control for correlated omitted variables that are associated with particular firms or reporting periods and potentially maintain linearity within each partitioning.

A different approach might be used to control for growth options and abandonment options (Barth et al. 2001). Growth options will probably be associated with industry membership and the intensity of intangible assets such as goodwill. This suggests that the inclusion of industry dummies and proxies for growth might control for growth options. Similarly, abandonment options will be strongly associated with weak economic performance. Including proxies of financial health will potentially control for these options (Barth et al. 2001). Like growth and abandonment options, conservatism is another reason for a nonlinear relationship between accounting numbers and stock prices. Conservatism refers to the fact that losses are generally recognised before profits in the profit and loss account. For instance, Basu (1997) defines conservatism as an accounting principle making earnings reflect "bad news" more quickly than "good news", which has consequences both for the timeliness and persistence of net earnings. Consistent with this, he reports that the earnings-response coefficients for positive earnings changes are higher than the earnings-response coefficients for negative earnings changes. This suggests that the association between earnings and stock prices is nonlinear, rather than linear. Barth et al. (2001) argue that the Ohlson model can handle conservatism. Subsequent refinements of the initial Ohlson model explicitly model the effects of conservatism (Feltham and Ohlson 1995, 1996). Moreover, the size of the coefficient on asset, liability and equity numbers might be interpreted as the degree of conservatism in those numbers. A lot of value-relevance studies try to explain why equity-market values exceed equity book values. These studies can be seen as attempts to examining conservatism in accounting (Barth et al. 2001).

A final concern is that value-relevance studies assume assets to be additively separable (Holthausen and Watts 2001). Lack of separability is one of the important characteristics of goodwill. As discussed in section 2.1, goodwill consists of economic assets that are inseparable from the firm. There is no active market where goodwill is traded, and hence, goodwill is not additively separable from other assets in the firm. Barth et al. (2001) argue that lack of separability does not lead to any problems. The regression coefficient on inseparable assets, such as goodwill, captures the incremental association with stock prices beyond that of other assets and liabilities (Barth et al. 2001).

In sum, it is debatable whether the value-relevance regressions can be justified by reference to the Feltham-Ohlson and Ohlson model. The reason is the weak link between the theoretical valuation models on the one hand and the regression specifications used to test value relevance on the other. If the Ohlson model is used as theoretical justification, at least some caution should be exercised when it comes to potential correlated-omitted variables and nonlinearity problems. Such problems will potentially bias the ordinary-least-square regression coefficients, t-statistics and R-square estimates which may lead to misinterpretations of the regression results.

3.3.2.5. Price level or return regressions

The choice of the correctly specified regression model is crucial in order to make correct inferences on empirical analyses (Barth et al. 2001). The choice between the price-level regression and the return regression has drawn a lot of attention in value-relevance research and more generally in market-based accounting research. Landsman and Magliolo (1988) argue that there is no single answer as to which regression model to choose when investigating associations between accounting numbers and stock prices. They state that the decision to choose a price-level regression or a return regression is a joint function of the assumed economic relationship between accounting numbers and stock prices (the economic model) and potential econometrical problems caused by the violation of ordinary-least-square regression assumptions. Landsman and Magliolo (1988) argue that the empirical ex-post counterpart of the capital-asset pricing model (CAPM), namely the market model, provides a basis for the return regression. Three arguments speak for a market-model design. First, the market model has a clear reference to the capital-asset pricing model which implies that risk is incorporated in a rigorous fashion. Second, a solution is offered to the scaling problem as the relevant scale proxy becomes the opening stock price of the return period. And third, the return model provides some control for potential correlated-omitted variables. The above arguments, however, are not fully valid. First, a number of other risk proxies than market beta are found to explain stock returns (e.g. Fama and French 1993, 1995, 1996). The empirical applicability of the market model is, therefore, debatable. Second, scaling by opening stock price does not totally eliminate scale effects (Barth and Clinch 2009) and third, the return model is only efficient to mitigate problems of correlated-omitted variables if the variables are constant over time. If, instead, these variables vary intertemporally, the return model may exacerbate specification problems (Barth 2000).

Kothari and Zimmerman (1995) argue that price-level and return regressions have both strengths and weaknesses. Net earnings consist of a surprise component and a stale component. The stale component is irrelevant when explaining current return, and thus, constitutes an error in the independent variable. As a result, the regression coefficient will be biased towards zero in the return regression. The price-level regression, however, does not suffer from this problem because stock prices reflect the cumulative information of both the surprise and the stale component (Kothari and Zimmerman 1995). Price-level regressions, however, are expected to suffer from more serious heteroscedastic disturbance caused by scale effects. This issue will be further discussed in chapter six.

Both Landsman and Magliolo (1988) and Kothari and Zimmerman (1995) emphasise that the choice of model should be based on the hypotheses supposed to be tested by the regression model. Price-level regressions are appropriate to investigate what is reflected in firm value, whereas return regressions are appropriate to investgate what is reflected in changes in firm value (Barth et al. 2001, Beaver 2002). Taken together, neither of these two specifications is superior to the other. Rather, there are arguments for including both specifications when investigating value relevance of accounting numbers and, in particular, value relevance of earnings components such as goodwill-impairment losses. Both regressions models are, therefore, employed in this dissertation. This does not suggest, however, that econometrical problems, for instance in price-book earnings regressions, are of no concern. Potential econometrical problems such as heteroscedasticity caused by scale effects are carefully investigated in the empirical analysis of this dissertation.

3.4. Accounting for goodwill – evidence of value relevance

The second part of this chapter discusses the value relevance of book goodwill, goodwill-amortisation charges and goodwill-impairment losses. Some studies are also included that report evidence on the information content of impairment losses and write-downs in other assets than goodwill.

3.4.1. Value relevance of book goodwill

The value relevance of capitalised and non-capitalised assets and liabilities has been investigated for decades. Landsman (1986) is among the first to study whether capitalised assets and liabilities represent economic assets and liabilities reflected in stock prices. He investigates whether pension-fund assets and liabilities are associated with stock prices by employing a balance-sheet regression where pension and non-pension assets and liabilities are included as independent variables. This study inspired researchers to investigate the value relevance of other assets such as goodwill. Amir et al. (1993) and Chauvin and Hirschey (1994) are among the first to report value-relevance findings for book goodwill. Both studies report evidence consistent with book goodwill being value relevant. None of these studies, however, have the value relevance of book goodwill as primary focus. This is the focus, however, in McCarthy and Schneider (1995). They test whether book goodwill has value relevance beyond other assets and liabilities. At the date of the business combination, it is reasonable to believe that recognised goodwill represents expectations of future cash flows. This suggests a positive association between book goodwill and stock prices. The regression coefficient on book goodwill is found to be positive and significant in all years and larger than the the coefficients on other assets. However, the null hypothesis of equal coefficients can only be rejected in two out of five years. They address several econometrical problems. Cross-sectional regressions will generally suffer from heteroscedastic disturbance. Hetereoscedasticity might arise from measurement errors and misspecified regressions. They find evidence of heteroscedasticity in 14 out of 15 regressions. To mitigate problems of heteroscedasticity, all the standard errors are adjusted by White's robustness procedure (White 1980). They also scale all the variables with total sales. The results are unchanged. Another potential econometrical problem is multicollinearity. If the regressions suffer from multicollinearity, it is not possible to isolate the effect of one of the independent variables controlling for the others. McCarthy and Schneider (1995) argue that instability of the regression coefficients might be a result of multicollinearity. Rather than including book value of liabilities and book value of assets less goodwill as independent variables, they combine these two variables in one independent variable: net assets less goodwill. The results remain the same.

Similar to McCarthy and Schneider (1995), Jennings et al. (1996a) investigate the association between book goodwill and stock prices. Their sample consists of 259 US-listed firms with observations over the period 1982-1988. The value relevance of book goodwill is investigated by year-by-year regressions. A positive coefficient is reported for book goodwill. Consistent with the findings of McCarthy and Schneider (1995), the coefficient on book goodwill is generally higher than the coefficient on property, plant and equipment and the coefficient on other assets. A high regression coefficient may indicate that goodwill is understated relative to goodwill reflected in stock prices. There are several reasons for a high regression coefficient. One potential reason is that book goodwill proxies for total goodwill reflected in stock prices. Another reason is that book goodwill proxies for the economic success of the firm. In both cases there is a correlated-omitted variable which biases the coefficient on book goodwill. Jennings et al. (1996a) argue that relatively more successful firms are better able to and more inclined to engage in business combinations than relatively less successful firms. To address this concern, they pool all the firms across years and run a fixed-effects regression. Fixed effects across firms and years not captured by the independent variables are controlled for by separate intercepts for each firm and separate intercepts and regression coefficients for each year. The average regression coefficients on book goodwill in the fixed-effects regressions are smaller than the average regression coefficients across the seven year-by-year regressions. The year-by-year-regression results are to some extent driven by correlated-omitted variables controlled for in the fixed-effects regressions. Similar evidence to those reported by McCarthy and Schneider (1995) and Jennings et al. (1996a) is demonstrated by Huijgen (1996), Wilkins et al. (1998) and Petersen (2002).

The study by Henning et al. (2000) represents a significant extension to the prior literature. Rather than investigating the value relevance of book goodwill, they investigate the value relevance of components of goodwill by separating the purchase premium into four different components similar to those suggested by Johnson and Petrone (1998). Two components are supposed to reflect core goodwill: One component present in the target prior to the business combination, going-concern goodwill, and another component created as the result of the business combination, synergy goodwill. Goodwill is the residual from the acquisition analysis. Any flaws when identifying assets and liabilities or estimating fair values of these assets and liabilities will directly affect the goodwill amount. This means that recognised goodwill might include components that are not part of goodwill such as write-ups to fair value of identifiable assets.

Henning et al. (2000) estimate values on these components and investigate whether they are value relevant. They use a sample of 1576 business combinations over the period 1990-1994. The asset write-up to fair value is estimated as the difference between the fair value of identifiable assets and the pre-acquisition book value. The going-concern component is estimated as the difference between the pre-acquisition market value six days prior to the business combination and the fair value of identifiable assets. The synergy component is estimated as the sum of the cumulative abnormal returns of the target and the acquirer for the eleven days centred on the date of the acquisition announcement. And finally, a potential overprice is estimated as the purchase price less the pre-acquisition equity book value of the target and the sum of the other components. All components except overprice are predicted to be positively associated with stock prices. The overprice component represents a loss and is, therefore, predicted to have a negative association with stock prices. Evidence consistent with these predictions is found. The asset write-ups and the going-concern components have positive coefficients. The synergy components are also found to have a positive coefficient, but a coefficient that is significantly higher than the going-concern coefficient. And finally, the overprice coefficient is found to be negative.

In sum, research findings from prior literature suggest that book goodwill reflects value-relevant information. This is consistent with the notion that purchased goodwill should be classified as an asset and capitalised on the balance sheet. The next section discusses literature investigating the value relevance of goodwill amortisation.

3.4.2. Value relevance of goodwill-amortisation charges

Several studies have investigated the extent to which goodwill-amortisation charges reflect value-relevant information. Jennings et al. (1996a) argue that goodwill amortisation should be negatively associated with stock prices. They find, however, that the association between goodwill amortisation and stock prices is insignificant in all seven years investigated and that only five out of seven years have a predicted negative association. For the remaining years, the coefficient on amortisation charges is insignificantly negative. This questions whether these charges provide any value-relevant information. The above results, however, could be driven by correlated-omitted variables. Jennings et al. (1996a) argue that the insignificant coefficient on amortisation charges could be the result of growth options. To examine this possibility, they pool all the firm-year observations over seven years and estimate a fixed-effect regression with separate intercepts for each firm and separate intercepts and regression coefficients for each year. The fixed-effect regression will potentially control for variation across years and firms not captured by the independent variables. When including these fixed-effect dummies, the average coefficient on goodwill amortisation turns negative and significant. They also rerun all the year-by-year regressions including book goodwill as an additional independent variable. The inclusion of book goodwill turns five out of seven coefficients significantly negative.

There are several studies investigating the value relevance of goodwill amortisation that are close to Jennings et al. (1996a) when it comes to research design and research findings. One of these is the study by Petersen (2001, 2002).

He employs 307 firm-year observations for Danish-listed firms over the period 1984-1997. Goodwill-amortisation charges are calculated for different amortisation periods. This makes it possible to explore whether certain amortisation periods of goodwill increase or decrease the value relevance of these charges. The coefficient on amortisation charges is in some cases found to be significantly negative as predicted, but in other cases insignificant. Several additional tests are employed. For instance, a price-earnings regression is run instead of a return-earnings regression, but with unchanged results. Huigjen (1996) reports somewhat similar results. He finds that goodwill amortisation has positive, but insignificant coefficients in most regressions.

Two of the most cited value-relevance studies on goodwill amortisation are Jennings et al. (2001) and Moehlre et al. (2001). Jennings et al. (2001) use a sample of 2 918 observations of US-listed firms for the period 1993-1998. They run both cross-sectional year-by-year regressions and a pooled fixed-effect version of the regressions. The purpose of the study is to investigate whether net earnings without goodwill amortisation or net earnings with goodwill amortisation are best to explain variation in stock prices. If goodwill amortisation enhances the usefulness of net earnings, then net earnings with goodwill amortisation shall explain more of the observed cross-sectional variation in stock prices than earnings without goodwill amortisation. Explanatory power is used as a metric of value relevance. The results suggest that net earnings with goodwill amortisation explain the variation in stock prices to a larger extent than net earnings without goodwill amortisation. All the differences in explanatory power in the year-by-year regressions and the pooled fixed-effect regressions are statistically significant. They also include goodwill-amortisation charges as an independent variable. As concluded by Jennings et al. (2001:26): *"(...) excluding goodwill* *amortization from corporate income statements under the new rule will not reduce the usefulness of earnings but, rather, may eliminate a source of noise in earnings as measured under previous standards."* Similar results are reported by Moehlre et al. (2001).

For the sake of completeness, this section ends with two studies investigating components of goodwill and goodwill-amortisation charges. As stated in the previous section, Henning et al. (2000) separate the purchase premium into four different components following Johnson and Petrone (1998). The study investigates whether the capital market places different valuation weights on components of goodwill and goodwill-amortisation charges. To calculate goodwill amortisation for each component, they use the fraction each component represents of book goodwill. This makes it possible to investigate whether certain components of goodwill-amortisation charges are value relevant. The results suggest that several of these components of goodwill-amortisation charges lack value relevance which is consistent with the findings in Huigjen (1996), Jennings et al. (2001), Moehlre et al. (2001) and Petersen (2002).

Bugeja and Gallery (2006) investigate the value relevance of components of goodwill from a different perspective. They do not separate purchased goodwill in different components at the date of the business combination. Rather, they separate book goodwill by age. They argue that a limitation of previous studies, except the study by Henning et al. (2000), is that they are *"(...) generally restricted to testing the association between market value and aggregated amounts of goodwill"* (Bugeja and Gallery 2006:523). Book goodwill accumulates goodwill from multiple business combinations, and therefore, is likely to reflect goodwill of different ages. The fundamental idea is as follows: *"If goodwill is* *regarded as an asset over its nominated useful life, it is expected to be priced by the market for the period it is recognised. However, if the economic benefits of purchased goodwill are considered to dissipate over a shorter period than nominated useful life, then the value relevance of goodwill should decline with age"* (Bugeja and Gallery 2006:523). Their sample consists of 475 firm-year observations for Australian-listed firms over the period 1995-1999. The results indicate that the value relevance of purchased goodwill increases from the year of the business combination to the first year subsequent to the business combination, as the regression coefficient increases, and then, decreases in the second year, and finally, is no longer value relevant three years after the business combination. They state that *"(...) over time the benefits of the acquisition are increasingly reflected in the normal operations of the firm so that these benefits are reflected in net income and not the balance of goodwill included in the regression model"* (Bugeja and Gallery 2006:531). These results suggest that goodwill has a limited, and probably short, economic lifetime.

Summing up, the results for goodwill-amortisation charges are rather inconsistent. The regression coefficient on these charges is in some cases insignificant, in other cases significantly positive and in yet other cases significantly negative. Evidence also indicates that the economic lifetime of goodwill is rather short (Bugeja and Gallery 2006). One reason for some of the inconsistent results could be econometrical problems, for instance, insufficient correction for scale effects, multicollinearity problems and correlated-omitted variables.

3.4.3. Value relevance and information content of impairment losses

The literature has carefully investigated the value relevance and information content of impairment losses. Only scarce evidence, however, is reported for goodwill-impairment losses under the impairment-only method. The first section discusses evidence on the information content and timeliness of impairment losses and write-downs, while the last section discusses evidence on the value relevance of goodwill-impairment losses.

3.4.3.1. Information content and timeliness of impairment losses

The information-content methodology makes it possible to investigate the extent to which a piece of accounting information, e.g. an impairment loss, conveys new and relevant information to the capital market. The market response upon the revealed information is measured as abnormal returns or trading volume over a narrow window surrounding the announcement day (Collins and Kothari 1989, Kothari 2001). If changes in stock prices or trading volume are significant, the conclusion is that the announcement conveys price-relevant information. As stated by Kothari (2001:116): *"The degree of confidence in this conclusion critically hinges on whether the events are dispersed in calendar time and whether there are any confounding events (e.g. a simultaneous dividend and earnings announcement) co-occurring with the event of interest to the researchers."* The last issue is particularly important when it comes to impairment losses. They are frequently announced as part of a larger restructuring, which often involves restructuring plans and changes in dividend policy.

Strong and Meyer (1987) are among the first to investigate the information content of write-down announcements. They do not separate impairment losses from restructuring charges although these charges are fundamentally different. If faithfully reported, impairment losses will reflect current-value reductions. Restructuring charges, however, may reflect the opposite, that is, increased current values (e.g. Elliot and Shaw 1988, Francis et al. 1996, Bartov et al. 1998). Strong and Meyer (1987) investigate the market response to 78 write-downs over the period 1981-1985. The information content of these write-downs is examined by the effect of the write-down on stock returns. They report a positive abnormal return prior and subsequent to the announcement period. In the announcement period, however, the write-down firms have negative abnormal returns. These results should be interpreted with caution since impairment losses and restructuring charges are pooled together.

Elliot and Shaw (1988) investigate 240 firms reporting write-downs for the period 1982-1985. In contrast to Strong and Meyer (1987), they investigate the information content of impairment losses and restructuring charges separately. Consistent with Strong and Meyer (1987), they find a negative abnormal return in the announcement period. They do not find, however, evidence of a positive abnormal return subsequent to the announcement. The impairment firms have a negative industry-adjusted return over a period of six months subsequent to the announcement. Elliot and Shaw (1988) conclude that these findings contrast with the hypothesis that impairment losses are positive signals to the capital market. Rather, the findings are consistent with the notion that impairment losses are reported *"(...) during a period of sustained economic difficulty"* (Elliot and Shaw 1988:114). Zucca and Campbell (1992:36), however, report no market response surrounding the write-down announcement: *"On the average, there were no significant unusual or excess returns earned by the write-down firms over this period of time."* Other reasons than the lack of information content might be plausible. Zucca and Campbell (1992) do not control for other announcements that might explain the market response. For instance, positive earnings signals reported simultaneously with the impairment losses will potentially confound the association between these losses and abnormal returns.

Later studies investigate different research questions and employ different research designs. Some of these later studies make attempts to respond to the suggestions made by Waymire (1988). He argues that research on impairment losses should take into consideration the degree of discretion across different "types" of impairment losses and the influence of the history of prior impairment losses. Elliot and Hanna (1996) investigate whether the capital market responds differently to net earnings in firms with repeated impairment losses versus firms with no or one impairment loss. Francis et al. (1996) investigate the market response to impairment losses in different assets along with the market response to restructuring charges, whereas Rees, Gill and Gore (1996) investigate the relationship between impairment losses, abnormal accruals and market responses. And finally, Heflin and Warfield (1997) and Bartov et al. (1998) provide evidence on the timeliness of impairment losses.

Elliot and Hanna (1996) investigate a sample of 2761 firms reporting at least one impairment loss, defined as large special items,[11] in the period 1970-1994. To examine the impact of repeated impairment losses on the information content, the researchers examine the change in the earnings-response coefficient when a firm reports several impairment losses in sequence. They regress two-day market-adjusted returns on unexpected earnings before special items. This model is run separately for six partitions based on the number of impairment losses in sequence: no impairment loss, one impairment loss, two, three, four and more than four impairment losses. The results demonstrate that impairment losses are negatively associated with stock returns. Moreover, the earnings-response coefficient on impairment losses declines as the sequence of impairment losses increases and becomes insignificant for long sequences of impairment losses.

[11] Large special items are defined as special items in excess of 1% of total assets (Elliot and Hanna 1996:135).

They conclude that *"(...) when a write-off evolves into a series of write-offs, valuation implications of each of the components of reported earnings is altered. This is consistent with a lessening of investors' confidence in their ability to understand and value the permanent and transitory composition of the reported earnings realizations"* (Elliot and Hanna 1996:154). In contrast to Elliot and Hanna (1996), Francis et al. (1996) investigate impairment losses for different assets along with restructuring charges. The study employs a sample of 507 impairment losses reported in the period 1989-1992. To examine the market response to the impairment-loss announcement, the researchers regress the market-adjusted two-day returns on the impairment losses. The market response is found to be negative. However, when the impairment losses are investigated for different classes of assets, the market response is insignificantly positive for impairment losses in property, plant and equipment and goodwill and significantly negative for impairment losses in inventory. This evidence is consistent with the notion that impairment losses in less discretionary assets such as inventory reflect current-value reductions, whereas impairment losses in more discretionary assets such as goodwill are too unreliable to represent price-relevant information.

Rees et al. (1996) investigate the association between impairment losses and abnormal accruals for a sample of 277 firms reporting 365 impairment losses over the years 1987-1992. Consistent with other studies, the sample firms have significantly lower return-on-assets and market-adjusted returns prior to the impairment loss than the median firm in their industry. A modified version of the Jones model is used to estimate abnormal accruals. Firms with impairment losses are found to have significantly negative abnormal accruals in the year of the impairment-loss announcement. These accruals do not reserve in subsequent years. The researchers interpret these findings as evidence *"(...) that the write-*

down and concurrent discretionary operating accruals are an appropriate response by management to changes in the firm's economic environment" (Rees et al. 1996:168). This is consistent with the notion that impairment losses faithfully reflect economic impairment. Bunis (1997) argues that impairment losses may reflect positive, no or negative cash flows. Rather than investigating abnormal accruals, Bunis (1997) studies cash-flow implications associated with impairment losses. He investigates 207 US-firms reporting impairment losses in the period 1983-1989. The impairment firms are classified into three groups: Firms where impairment losses are supposed to have negative cash-flow implications, firms where impairment losses are supposed to have no cash-flow implications, and finally, firms with positive cash-flow implications. As stock prices are supposed to reflect future cash flows, any negative or positive change in expected cash flows associated with an impairment loss is believed to be followed by a negative or positive market response. The results support these predictions. Impairment losses that are supposed to have negative cash-flow effects are followed by negative market responses, just as impairment losses with positive cash-flow effects are followed by positive market responses. As predicted, impairment losses with no cash-flow effects are not followed by any significant market response.

Heflin and Warfield (1997) investigate the timeliness of impairment losses. Their sample includes 845 impairment losses reported by 588 US-firms in the period 1985-1991. They find that pre-impairment earnings of impairment firms are generally higher or equal to industry-matched earnings in three years preceding the impairment losses, but their earnings fall below industry levels in the impairment year. They find that pre-impairment earnings are negatively associated with stock returns over the three years preceding the impairment losses which is inconsistent with timely recognition of impairment losses. Bartov et al. (1998)

investigate both the information content and the timeliness of impairment losses and restructuring charges. They claim that the market response to impairment losses is much smaller in size than the impairment loss per share. Referring to prior studies by Strong and Meyer (1987) and Elliot and Shaw (1988), they argue that impairment losses average around 20% of the firms' market values as the market responses are less than one percent. They believe the capital market underreacts to impairment announcements and gradually adjust in the post-announcement period. An alternative explanation could be that the market largely anticipates the impairment losses prior to the announcement. They study 373 impairment announcements of 298 US-firms in 1984 and 1985. A negative association is found between abnormal returns and impairment losses over a four-day announcement period. The results also demonstrate a negative abnormal return over a period of two years preceding the announcement. This suggests that the impairment losses are anticipated by the capital market prior to the impairment announcement, which is inconsistent with timely recognition of these losses.

The above studies, however, report scarce evidence on market responses on goodwill-impairment losses. Except from Francis et al. (1996), none of these early studies investigate the information content of these losses. Hirschey and Richardson (2002, 2003) are among the first. They investigate the information content of 80 goodwill-impairment announcements for US-firms over the years 1992-1996. A significantly negative market response is found on the pre-announcement day and the impairment-announcement day. They also test whether the market response is different when other announcements are made simultaneously with impairment losses. The market response is insignificantly positive when positive earnings announcements are reported simultanously with impairment losses. If these earnings announcements are negative, the market response is also negative. Abnormal returns in both the pre and post-announcement periods are investigated. The results are somewhat mixed. A significant negative abnormal stock return is found prior to impairment announcements. Similar results are found when impairment announcements are reported simultaneously with negative earnings announcements. Abnormal returns are found to be significantly negative in some cases and insignificantly negative in other cases subsequent to the announcement. These results suggest that the capital market partly, but not fully, anticipates goodwill-impairment losses prior to their announcement.

Some recent studies have investigated the information content and timeliness of goodwill-impairment losses under SFAS 142. Li et al. (2004) test the information content of 385 impairment-loss announcements reported for US-firms in the years 2002 and 2003. They investigate the market response over a three-day window centred on the announcement day. If the announcement provides new and relevant information to the capital market, the market response is predicted to be negative. They find evidence consistent with these predictions. A negative stock return is also found as far back in time as eight quarters prior to the announcement day. Goodwill-impairment losses are, therefore, to some extent anticipated by the capital market prior to the announcement. Chen et al. (2004, 2008) investigate the timeliness of 726 goodwill-impairment losses reported under SFAS 142. Their focus is on the losses reported in the adoption year of SFAS 142 (year 2002). The first-time-adoption impairment is an adjustment that brings book goodwill in line with SFAS 142. Chen et al. (2004, 2008) claim that SFAS 142 requires a more rigorous and timelier test procedure on goodwill compared to prior regulation. Based on this notion, they argue that the adoption impairment should be associated with prior years' stock returns only. They find results consistent with these predictions. Similar results are reported by Bens and Heltzer (2005) and Bens, Heltzer and Segal (2007).

The above evidence suggests that impairment losses convey new and relevant information to the capital market. Still, these losses are to some extent anticipated by the capital market prior to their announcement or recognition in the financial statement. Some concerns, however, limit the significance of these findings. Strong and Meyer (1987) and Elliot and Hanna (1996) investigate large special items which include impairment losses, restructuring charges and prior years' adjustments. These items are basically different and pooling them together may confound the results. There is also another methodological problem. None of these studies investigate the market response to the unexpected portion of impairment losses. Rather, they investigate the market response to the entire impairment-loss amount, which may bias the regression coefficients (Alciatore et al. 1998).

3.4.3.2. Value relevance of goodwill-impairment losses

Information-content studies investigate market responses to accounting numbers such as impairment losses, whereas value-relevance studies investigate the extent to which accounting numbers reflect information in stock prices. Some of the previously discussed studies have investigated the value relevance of goodwill-impairment losses. The findings from these studies will briefly be referred to in this section. Chen et al. (2004, 2008) investigate the value relevance and timeliness of goodwill-impairment losses. They compare the explanatory power of two regressions where the first regression includes adoption-impairment losses and the second subsequent impairment losses. The results support the notion that impairment losses provide value-relevant information. Similar results are reported by Li and Meeks (2006). They employ a price-earnings regression and find a significantly negative association between impairment losses and stock prices in the adoption-year 2002. For previous years, 1997-2001, the association is insignificant.

None of these studies compare the value relevance of goodwill under alternative accounting methods. Chambers (2007) offers such a comparison. He examines alternative methods for goodwill and compares the relative value relevance of goodwill numbers reported under each method. The sample includes 5262 firm-year observations over the years 2003-2005. Eight different combinations of accounting methods are investigated: Impairment testing, impairment testing and amortisation over three amortisation periods, amortisation over three amortisation periods and permanent retention. The amortisation periods are 10, 20 and 40 years. The coefficient on book goodwill is smallest under the impairment-only method and the permanent retention method, suggesting that book goodwill is being discounted in the absence of amortisation. The coefficient on goodwill-impairment losses is statistically significant under the impairment-only method, but not under impairment testing combined with amortisation. This suggests that goodwill-impairment losses are irrelevant in the presence of amortisation. Goodwill amortisation combined with impairment testing gives higher explanatory power than any other accounting method for goodwill. Thus, goodwill numbers from an accounting system that includes amortisation in combination with impairment testing provides more value-relevant information than an accounting system where goodwill is treated as a permanent asset or where goodwill is either amortised or tested for impairment losses. The evidence is interesting because it suggests that the previous accounting method is the one providing most value-relevant information. This contradicts the conclusion made by IASB and FASB. To challenge these results, Chambers (2007) performs additional tests. The results from these tests reveal that the value relevance of goodwill numbers is sensitive to the size of the firm, the size of book goodwill and whether the firms are financially distressed.

The results for goodwill-impairment losses are rather inconsistent. Some studies like Chen et al. (2004) and Li and Meeks (2006) suggest that goodwill reported under the impairment-only method provides more value-relevant information than goodwill reported under the previous amortisation method. Chambers (2007) finds evidence inconsistent with these results. He concludes that the combined amortisation-and-impairment method provides the most value-relevant information. Thus, it is not apparent which method to prefer based on value-relevance findings.

4. Earnings management – some fundamentals and prior evidence for goodwill

The value-relevance methodology is believed to provide evidence on relevance, but only to a limited extent reliability of accounting numbers. As decision usefulness is defined on the premise of relevance and reliability, additional tests for reliability are needed. This seems particularly important when it comes to discretionary items such as goodwill-impairment losses. The earnings management and corporate-governance literature are believed to provide a theoretical and methodological foundation for investigating the reliability and the degree of misrepresentation in accounting numbers. The first part of the chapter discusses what earnings management is, how earnings management may affect decision usefulness and the incentives that may trigger earnings management. The next part discusses earnings management in relation to corporate governance. The last part of the chapter reviews prior evidence on earnings management in impairment losses.

4.1. Earnings management defined

Earnings management can be considered as deliberate actions taken by managers to affect outcomes on explicit or implicit contracts where these outcomes are directly or indirectly affected by accounting information (Field et al. 2001, Ronen and Yaari 2008: xiv). Earnings management is generally interpreted as an earnings-reporting phenomenon. This means that the reporting behaviour is basically motivated by its effects on earnings rather than its effects on other elements of the financial statement. Others, however, interpret the concept more broadly. Schipper (1989) for instance, interprets earnings management as disclosure management, which suggests that all managerial activities that have the intent to affect accounting information are part of the concept. Nevertheless, earnings are generally considered to be the single most important reporting number as shareholders are believed to *"buy future earnings"* (Lev 1989, Penman 2003, Graham, Harvey and Rajgopal 2005, Dichev 2008). Besides, recent research demonstrates that smooth earnings streams and earnings that meet or beat last year's earnings are particularly desirable to managers (e.g. Graham et al. 2005). This suggests that earnings management should be considered as "managing earnings" rather than managing other elements of the financial statement.

Reported earnings are affected by real economic decisions and reporting decisions. In some cases real economic decisions are made to affect earnings. The question is whether these decisions should be considered as earnings management. Some researchers claim that economic decisions are earnings management if the motivation for the decisions is to alter reported earnings. If the economic decisions are made to increase the value of the firm, they are not earnings management. In contrast, if economic decisions are made for the purpose of affecting reported earnings, the decisions might be considered as earnings management (Schipper 1989, Field et al. 2001, Ewert and Wagenhofer 2005). Graham et al. (2005) argue that managers make reporting decisions as well as real economic decisions to meet or beat earnings targets. For instance, the managers are willing to spend or withdraw research and development expenses, advertising expenses and maintenance expenses for the sake of meeting or beating such earnings targets. They report that more than half of the managers in their survey state that they will delay starting a new project to meet an earnings target. This evidence is dramatic as it suggests that managers are willing to impose economic losses upon the firm for the sake of reporting desired earnings numbers.

Beneish (2001) argues that the time horizon over which the accounting is affected may serve as a demarcation between economic decisions and their effects on reported earnings on the one hand and reporting decisions on the other. If real economic decisions delay or accelerate a discretionary expenditure for a short period of time surrounding the fiscal-year end, the economic decision might be considered as earnings management. He does admit, however, that the inclusion of investment and financing decisions will make it difficult to disentangle earnings management from economic decisions not intended to be part of a reporting strategy. This point is also made by Ewert and Wagenhofer (2005:1106): *"Real earnings management is often indistinguishable from other economic transactions undertaken by the firm."* It is reasonable to believe that most economic decisions are made to exploit profitable opportunities. An interpretation where economic decisions in general are seen as part of the managers' reporting strategy, will lead to false conclusions regarding the significance of earnings management. Besides, managing earnings by making economic decisions are probably the expensive way to report desired earnings numbers. As far as other alternatives are available, earnings will probably be manipulated directly by exploiting the discretionary freedom in accruals rather than indirectly through economic decisions. As stated by Ronen and Yaari (2008:318): *"Intuitively, accruals management seems more appealing."* On the other hand, managing earnings by real economic decisions has the added benefit that it is less transparent, and thus, much harder to detect (Holthausen, Larcker and Sloan 1995). This argument, however, is weighted at a discount. Earnings management is, therefore, perceived as a reporting phenomenon in this dissertation.

The conceptual meaning of earnings management is sometimes contradictory. This makes the concept particularly demanding to understand. Managers may engage in earnings management to inform or to mislead stakeholders (e.g. Dechow 1994, Scott 2012:423). This suggests that earnings management is motivated by signalling or by opportunism (Beaver 2002). Ronan and Yaari (2008:25-6) provide a careful discussion of this positive and negative side of earnings management. Three different interpretations of the concept are discussed, symbolised by "white", "grey" and "black". "White" earnings management is reporting decisions made by the managers to reveal private, faithful information about the firm. Such earnings management is non-opportunistic. "Grey" earnings management is reporting decisions made for opportunistic or non-opportunistic reasons. Opportunistic earnings management is expected to increase the wealth of *some* stakeholders, for instance the managers, at the expense of *some* others, for instance the shareholders, by reporting misleading information. In contrast, non-opportunistic earnings management is expected to increase the wealth of stakeholders (all contracting parties) by reporting faithful information (Watts and Zimmerman 1990). This highlights the point that accounting might be misleading while at the same time non-opportunistic towards certain stakeholders. For instance, shareholders will benefit when earnings management is used to reveal private, faithful information about the firm. However, shareholders may also benefit from earnings management that is conducted to mislead debtholders to avoid costly debt re-contracting (Peasnell et al. 2005, Zhong, Gribbin and Zheng 2007). "Black" earnings management is a purely opportunistic reporting activity. In the famous speech called *The Numbers Game* the former SEC (Securities and Exchange Commission) chairman Levitt (1998) expresses concern about what he calls an *"(...) erosion in the quality of earnings, and therefore, the quality of financial reporting."* He describes the flexibility within and outside existing US-GAAP as a continuum *"(...) between legitimacy and outright fraud. A gray area where the accounting is being perverted; where managers are cutting corners;*

and where earnings report the desires of management rather than the underlying financial performance of the company." An interpretation of earnings management as an opportunistic and even fraudulent reporting activity is common. For instance, Schipper (1989:92) describes earnings management as *"(...) purposeful intervention in the external financial reporting process, with the intent of obtaining some private gain."* Healy and Wahlen (1999:368) state that *"(...) earnings management occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers."* This suggests that the demarcation between "white", "grey" and "black" earnings management is found in the managerial intent. In this dissertation, if not stated otherwise, earnings management is interpreted as an opportunistic reporting activity.

Reporting decisions are either in coherence with existing GAAP or not. Earnings management that leads to GAAP violations is probably intended to mislead some stakeholders. Conversely, earnings management intended to inform stakeholders will probably be in coherence with GAAP. Davidson, Stickney and Weil (1987: cited in Schipper 1989:92) define earnings management as *"(...) the process of taking deliberate steps within the constraints of generally accepted accounting principles."* Others argue that earnings management is misrepresentation and fraud, which suggests accounting outside GAAP (e.g. Schipper 1989). Dechow and Skinner (2000) try to distinguish reporting decisions made within GAAP from reporting decisions outside GAAP. Accounting within GAAP is termed *conservative accounting*, *neutral accounting* or *aggressive accounting*, while accounting outside GAAP is termed *fraudulent accounting*. Reporting sales before they are realised, reporting fictitious sales, backdating sales invoices and overstating inventory by recording fictitious inventory are examples of fraudulent accounting. Fraudulent accounting clearly demonstrates the intent to deceive stakeholders. Accounting within GAAP is more difficult to interpret *"(...) without any objective evidence of intent to distinguish earnings management from the legitimate exercise of accounting discretion"* (Dechow and Skinner 2000). All accounting decisions, within as well as outside GAAP, are more or less influenced by managers' reporting strategies (e.g. Dechow et al. 1996). Fraudulent accounting is not in focus in this dissertation. No attempts are, therefore, made to distinguish earnings management within GAAP from earnings management outside GAAP.

4.2. Earnings management and decision usefulness

Earnings-management research is not basically motivated by standard-setting considerations although there are exceptions (e.g. Ewert and Wagenhofer 2005). This does not mean, however, that the decision usefulness of accounting information is unaffected by earnings management. The likelihood and significance of earnings management is believed to increase in discretionary freedom. This freedom will partly be determined by the standard setters' beliefs in managers reporting relevant and reliable information. If standard setters believe that managers will make reporting decisions that represent the best in terms of decision usefulness, they will probably allow managers to make these decisions. In contrast, if standard setters believe that managers will engage in opportunistic earnings management, they will probably restrict their reporting flexibility (e.g. Ewert and Wagenhofer 2005). The trade-off between more and less discretionary freedom can be seen as a counterpart of the trade-off between relevance and reliability. More discretionary freedom gives managers the opportunity to report more relevant information, but such information may suffer from low reliability. If managers engage in opportunistic earnings management, this generally means that the reported information drifts away from reflecting economic fundamentals, which in turn will harm faithful representation, neutrality and reliability (Fischer and Verrecchia 2000).

On the other hand, less discretionary freedom may lead to less relevant, but more reliable and verifiable information. Thus, some optimal level of discretionary freedom may exist (Ewert and Wagenhofer 2005). Opportunistic earnings management is, therefore, expected to impair decision usefulness, whereas non-opportunistic earnings management is expected to improve decision usefulness by revealing private information. It is important to emphasise, however, that reporting economic fundamentals is neither a necessary nor sufficient condition for decision usefulness. First, as discussed in section 3.2 above, information about economic fundamentals may lack timeliness and thereby decision usefulness. Second, even information not reflecting economic fundamentals will in certain cases be decision useful. For instance, information about the risk of earnings management in accounting numbers might be useful for decision makers (Fischer and Verrecchia 2000, Fischer and Stocken 2004). The general notion, however, is that opportunistic earnings management will impair decision usefulness because accounting numbers deviate from their economic fundamentals.

4.2.1. Value relevance, information content and earnings management

The effect of earnings management on decision usefulness might be discussed with reference to the literature investigating the association between earnings management and value relevance (or information content). This is based on the notion that value relevance (or information content) provides some evidence on the decision usefulness or at least the valuation usefulness of accounting numbers. There are several analytical and empirical studies investigating the effect of opportunistic and non-opportunistic earnings management on value relevance (or information content) of accounting numbers.

Before discussing these studies, however, the somewhat contradicting assumptions of value-relevance methodology and earnings-management rationality need to be discussed (e.g. Scott 2012:303). Earnings management is only a rational reporting strategy if there is information asymmetry between managers and some, not necessary all, stakeholders. This implies that at least some markets (e.g. capital markets, markets for top managers), in which the firms' stakeholders allocate their resources, are less than strongly efficient (Field et al. 2001). Without any information asymmetry, there is no need for financial-accounting information and no room for earnings management. If expected benefits from earnings management exceed the costs, earnings management becomes a rational reporting strategy (Watts 1992, Fischer and Verrecchia 2000) (See section 4.3.1 below).

The value-relevance methodology is based on an assumption of semi-strong *capital markets*, which implies that the markets reflect all publicly available information such as financial-accounting information (e.g. Fama 1970). Earnings management might be a rational reporting strategy even in the presence of semi-strong capital markets. Non-opportunistic earnings management will reduce the information asymmetry between managers and stakeholders by reporting private information. The disclosure of private information might favourably affect the outcomes of contracts directly or indirectly written on accounting numbers and/or the pricing in markets that are less than strongly efficient (e.g. semi-strongly efficient). Opportunistic earnings management, however, might be hidden as private information. Semi-strong markets will only be efficient with respect to published information, not private information (Fama 1970, Beaver 1998:145). This implies that these markets will not detect opportunistic earnings management that is unknown. But, when the extent of earnings management can be detected by published information, semi-strong markets will immediately and fully reveal and penalise the manipulation. There is, therefore, a potential that semi-strong *capital markets* might be misled when there is insufficient published information to detect the earnings management. Still, this might not hold on average (Fischer and Verrecchia 2000). Moreover, it is reasonable to believe that opportunistic earnings management is a highly risky strategy in semi-strongly efficient markets. Financial-accounting information is only one out of numerous sources of information. The expected costs of opportunistic earnings management might, therefore, exceed the expected benefits in markets that are semi-strongly efficient. This might suggest that opportunistic earnings management will only be a rational reporting strategy if the markets (e.g the capital markets) are less than semi-strongly efficient (Field et al. 2001).

Some analytical studies have examined the association between earnings management and information content of earnings, measured by the earnings-response coefficient. The evidence from these studies shows that earnings management might increase or decrease earnings-response coefficients. Sankar (1999) investigates analytically how earnings maximisation and smoothing affect the return-earnings relationship. If investors expect managers to maximise earnings, but are unsure of the magnitude of the discretion available, reported earnings are on average less informative than when faithfully reported. This is not the case for income smoothing. Rather, he demonstrates the opposite. If investors expect managers to smooth earnings over a longer period of time, but are unsure of the degree of discretion available, then the reported earnings are on average more informative than when faithfully reported. The reason why is not that smoothing conveys private information about future earnings and future cash flows, but that smoothing decreases the variability in earnings and thereby increases the valuation usefulness of these earnings. Sankar and Subramanyam (2001) demonstrate similar results, but their analytical analysis is different. Managers might use their private information about future earnings to smooth earnings towards a more permanent earnings number. By doing so, the earnings number will gain higher valuation usefulness measured as higher earnings-response coefficients. Similar to Sankar (1999) and Sankar and Subramanyam (2001), Kirschenheiter and Melumad (2002) develop an analytical model based on the assumption that investors use earnings surprises as a metric of assessing earnings presision. In contrast to the above studies, they show that both smoothing and big-bath accounting could be non-opportunistic reporting strategies. Reporting a large earnings surprise reduces the inferred presision of earnings and provides a natural demand for smoother earnings. In contrast, a sufficiently large negative earnings surprise gives an incentive to report a maximum loss. The inferred precision of that loss will nevertheless be low.

Several studies have empirically investigated the impact of opportunistic earnings management on the earnings-response coefficient. These studies are based on assumptions of semi-strong market efficiency. If earnings management leads to unfaithful reporting of earnings, and the capital market is able to see through the manipulation, the earnings-response coefficient is supposed to be lower compared to the earnings-response coefficient when earnings are faithfully reported (Lev 1989, Kothari 2001). Empirical evidence supports this notion (Christensen, Hoyt and Paterson 1999, DeFond and Park 2001, Baber and Kang 2001, 2002, Burgstahler and Eames 2003, Cohen, Dey and Lys 2005, Lin and Shih 2009). For instance, Lin and Shih (2009) examine the earnings-response coefficient for firms that meet analysts' forecasts. They present evidence suggesting that the earnings-response coefficient is discounted for firms reporting zero or small positive earnings surprises.

Similar evidence is found in long-term value relevance studies (Warfield et al. 1995, Aboody, Barth and Kasznik 1999, Kallapur and Kwan 2004, Marquardt and Wiedman 2004). For instance, Kallapur and Kwan (2004) investigate value relevance and earnings management related to recognition of brand assets in 33 UK-listed firms. They separate the sample firms in two groups: one with high and one with low incentives for brand-asset capitalisation. The regression coefficients on the interactions between earnings-management proxies and brand capitalisation suggest that firms with lower incentives have larger coefficients relative to firms with higher incentives. This is interpreted as evidence of earnings management impairing the value relevance: *"The difference in market capitalisation rates indicates differences in the amount of bias or error in brand valuations of different groups of firms, suggesting that brand asset measures lack reliability for firms with high contracting incentives"* (Kallapur and Kwan 2004:170). The analytical and empirical evidence discussed in this section suggests that opportunistic earnings management is negatively associated with value relevance. To the extent value relevance measures decision usefulness, it supports the general notion that opportunistic earnings management impairs the decision usefulness of accounting numbers.

4.3. Earnings-management incentives

The incentives are the driving forces of earnings management. The effect of earnings management on decision usefulness is among the consequences. The following sections will discuss preconditions for earnings management and earnings-management incentives.

4.3.1. Earnings management – some preconditions

Three preconditions make earnings management a rational reporting strategy. The first condition concerns the characteristics of the markets in which the firms' stakeholders allocate their resources. As stated in the previous section, these markets must be less than strongly efficient (Field et al. 2001). Information cannot be free and perfectly available to all stakeholders simultaneously. Managers will generally have more and better information about the firm than other stakeholders. This information asymmetry will give rise to information and contracting costs. Under these conditions, accounting serves an important role to reduce the information asymmetry between managers and other stakeholders. This is consistent with managers using their reporting flexibility to reveal private information about the firms (i.e. non-opportunistic earnings management). In contrast, managers may use accounting as an instrument to mislead other stakeholders to obtain private benefits (i.e. opportunistic earnings management) (Watts and Zimmerman 1990, Warfield et al. 1995, Ramanna and Watts 2009). If opportunistic earnings management is observable at low cost, it is reasonable to believe that the earnings management is harmless to the stakeholders. As long as market participants have access to all relevant information and are sufficiently sophisticated in using that information, they will reveal the earnings management and undo its effects on accounting (Jensen and Meckling 1976, Watts and

Zimmerman 1978, 1986, Baber, Chen and Kang 2006). Under inefficient market settings, however, earnings management might be a rational reporting strategy.

The second condition concerns the discretionary reporting freedom available to managers. Without any reporting freedom, there will not be any room to engage in either non-opportunistic or opportunistic earnings management. All the reporting choices are pre-made by the standard setter. This will be the case in cash accounting. In a real accounting setting, however, there is more or less discretionary freedom, depending on the nature of the economic transaction and the event or the phenomenon to be reported (Schipper 2003, Ewert and Wagenhofer 2005). As discussed above, the discretionary freedom in reporting impairment losses is supposed to be rather excessive, providing the managers with opportunities to align the reporting strategy with their own reporting incentives (Ramanna 2008, Ramanna and Watts 2009). Even with excessive discretionary freedom, there are some constraining factors. The most important of these are monitoring mechanisms such as corporate-governance structures.

The third condition concerns the net benefits of earnings management. Rational managers will neither engage in non-opportunistic nor opportunistic earnings management unless the reporting strategy is expected to provide benefits that exceed the costs of the strategy (Watts and Zimmerman 1990, Gaver, Gaver and Austin 1995, Christensen et al. 1999). Some early analytical and empirical studies fail to recognise this important assumption (Fischer and Verrecchia 2000). These studies generally assume that all earnings management can be perfectly foreseen by the market participants. But under such market conditions, no rational manager will engage in earnings management simply because doing so will give the managers zero or even negative net benefits. Taken together, it is reasonable to expect earnings management (either non-opportunistic or opportunistic) if there is information asymmetry, discretionary reporting freedom and net benefits.

4.3.2. Earnings-management incentives – introduction

Three different, but not mutually exclusive sets of incentives are identified. The first set represents the desire to affect the outcomes of accounting-based contracts. The second set represents political-cost considerations and the third and last set represents the desire to influence the market perception of the firm or the market perception of top managers (e.g. Healy and Wahlen 1999, Dechow and Skinner 2000, Field et al. 2001). The literature also identifies other incentives such as those related to litigation and tax liabilities (e.g. Beaver 2002), but these incentives will not be considered in this dissertation.

Basically, all incentives can be addressed to contracting. The firms can be seen as a nexus of contracts between various stakeholders (e.g Coase 1937). There are a number of formal and explicit contracts and an even larger number of informal and implicit contracts. Formal and explicit contracts are those generally referred to. These are, for instance, remuneration contracts whose purpose is to align the interests of the managers with those of the shareholders, and debt contracts whose purpose is to align the interests of the managers and shareholders with those of the debtholders. Informal and implicit contracts are probably more frequent and take a variety of forms. For instance, the relation between the firm and society might be seen as an implicit contract. Other informal contracts can be found between the manager, i.e. the Chief Executive Officer (CEO) and the board of directors. Their relationship is extremely complex which makes it impractical to construct state-contingent contracts that specify appropriate actions under every single scenario. As a solution, the CEO and the board will generally develop a set of informal rules and understandings that guide the behaviour of both parties over time. Such informal and implicit contracts are complementary to employment and compensation arrangements (Watts and Zimmerman 1986:180, Armstrong, Guay and Weber 2010).

The theoretical underpinning of the contracting role in accounting is found in positive accounting theory. This theory provides explanations for reporting choices and earnings management. The objective of positive accounting theory is to *"(...) predict and explain accounting [decisions]"* (Watts and Zimmerman 1990: 132). To find explanatory variables for reporting decisions, Watts and Zimmerman (1978, 1979, 1986, 1990), the founders of positive accounting theory, made use of the principal-agent literature and the property-right literature (e.g. Coase 1937, Jensen and Meckling 1976, Fama and Jensen 1983, Sappington 1983, 1991, Grossman and Hart 1983). A principal-agent relationship exists if *"(...) one or more persons (principals) engage another person (agent) to perform some services on their behalf which involves delegating some decision making authority to the agent"* (Jensen and Meckling 1976:308). The literature on principal-agent relationships is particularly concerned with the conflicts of interest between managers on the one hand and shareholders on the other. A conflict between managers and shareholders is likely because these two parties have different risk attitudes, different access to company perks and/or different time-horizons (Ronan and Yaari 2008:61, Dey 2008). The following section will focus on managers and shareholders, but principal-agent conflicts are not limited to these relationships. In a later section, the potential conflict between managers, shareholders and debtholders is discussed.

An obvious problem for shareholders is to ensure that the managers make decisions in their interest. Positive contracting and information costs make it challenging to monitor the managers' decisions and/or align the interests of the managers with those of the shareholders. Given conflicts of interest and information asymmetry, the managers may act opportunistically, which will impose agency costs upon the shareholders (Jensen and Meckling 1976, Armstrong et al. 2010). Two remedies are supposed to reduce opportunism and agency costs: To monitor the decisions made by the managers, which increases the risk that opportunistic behavior will be detected and penalised, and to establish a contract which seeks to align the managers' interests with those of the shareholders (Fama and Jensen 1983). An effective board of directors is believed to monitor and constrain the risk of opportunism. Moreover, the conflicts of interest might be aligned by managerial ownership and compensation contracts (Core, Wayne and Larcker 2003). Compensation contracts could, therefore, be considered as corporate-governance mechanisms (Shleifer and Vishny 1997, Dey 2008). However, monitoring and contracting will generally incur costs. This suggests that monitoring and/or contracting will only be rational from the shareholders' point of view if the expected decrease in agency costs due to reduced opportunism outweighs the increase in costs due to monitoring and/or contracting.

In the property-right literature it is argued that efficient markets can solve the principal-agent problem. Given that managers hold a significant portion of the stocks, the agency costs are borne, at least to some extent, by the managers (Fama 1980, Watts and Zimmerman 1986, Field et al. 2001). Jensen and Meckling (1976) demonstrate this result. The wealth-reducing behaviour of the managers, the opportunism, is expected by the shareholders ex ante. The shareholders will then price-protect themselves by discounting the market price. This result will only hold if the markets are efficient (Fischer and Verrecchia 2000). If the contracting and/or information costs rise too high, the market will suffer from imperfections. The shareholders will no longer be price-protected and the shareholders, not the managers, will be the ones to bear the agency costs. Under such conditions, shareholders will have incentives to contract with the managers (Warfield et al. 1995, Dechow and Skinner 2000). Still, after contracting, some agency costs may remain due to high contracting and/or information costs.

This leads to an important recognition. Efficient contracts reduce (minimise) opportunism and agency costs. In contrast, inefficient contracts do not prevent opportunism; they rather create incentives for opportunism (e.g. Watts and Zimmerman 1990, Warfield, et al. 1995, Xie et al. 2003). In cases where contracts are written on accounting numbers, such as earnings, inefficient contracting implies that earnings management has the potential to increase the wealth of managers at the expense of the wealth of some other stakeholders of the firm, for instance the wealth of the shareholders. Core et al. (1999) investigate the determinants of CEO compensation. They find that CEOs of firms with greater agency problems receive greater compensation, and that these firms perform worse. It seems unreasonable to conclude, however, that contracts are inefficient on average for all firms and for longer periods of time. Inefficient contractual arrangements will probably be replaced by more efficient substitutes, for instance more efficient corporate-governance structures. Still, contracts may be inefficient for certain firms, in certain situations and in certain periods of time, especially when contracting and information costs are high (Watts and Zimmerman 1986, Core et al. 2003).

4.3.3. Accounting-based contracting incentives

This section discusses the accounting-based contracting incentives found in conventional positive accounting theory: Incentives for earnings management triggered by earnings-based compensation plans and accounting-based debt contracts. These incentives can be addressed to the bonus-plan hypothesis and debt-equity hypothesis, which initially were formulated by Watts and Zimmerman (1986, 1990).

4.3.3.1. Earnings-based compensation

Earnings-based compensation is intended to motivate managers to make decisions that maximise the firm value and the wealth of the shareholders. The compensation is generally given as a cash-bonus payment determined by an accounting number such as growth in earnings, growth in earnings before tax or growth in earnings-per-share. An earnings-based compensation plan is generally one out of several components of the managers' overall compensation package. Usually these packages also consist of salary, specific benefits (insurances, free house and car and pension benefits), and equity-based compensation such as stocks, conditional stocks and stock options. Salary is a fixed cash payment and to limited extent determined by managers' performance. Equity-based compensation, on the other hand, is non-cash-based and at least partly determined by stock return as an indicator of managers' performance. Thus, earnings-based compensation is understood as cash-bonus compensation in this dissertation.

The use of accounting earnings rather than firm value to determine the compensation is not straightforward. Watts and Zimmerman (1986) argue that the growth and survival of earnings-based compensation suggest that they are efficient contracts which motivate managers to make decisions that are expected to maximise firm value. There are several reasons for the existence of earnings-based compensation (Watts and Zimmerman 1986: 201-3). The majority of firms are not traded regularly, which implies that the firm-market value is not directly observable. This makes it costly to estimate changes in the market value of the firm. In such cases, the firm's earnings could be the most cost-efficient proxy. Second, even if the market value is observable, only top managers are responsible for the entire firm. The market values of subunits of the firm are generally not available, which means that the other managers' effect on the firm value cannot be observed directly. In recent years, however, this picture has changed and equity-based compensation has become increasingly important, not only for top managers, but also for managers at lower levels in the organisation (Core et al. 2003, Bushman and Smith 2003, Erickson, Hanlon and Maydew 2006).

The earnings number has to be reported under limited discretionary freedom. If managers can report any earnings number they want, they will probably manipulate the numbers to their own advantage, reporting arbitrarily high earnings rather than taking actions to increase earnings through firm-value increasing decisions. The demand for some conservatism and verifiability in earnings numbers are examples of regulatory restrictions that limit the discretionary freedom. Still, compensation plans allow some discretion. Dye and Verrecchia (1995) argue that discretion is necessary to allow the management to reveal private information. This is based on the assumption that efficient contracting is possible. But, if such contracting is unattainable because of high contracting and information costs, the allowed discretion is surprising. Evans and Shribar (1996) offer a pragmatic justification. In their model it is costly for the shareholders to eliminate all reporting flexibility as it removes the managers' opportunity to choose an efficient set of accounting methods. This makes some flexibility a relatively low-cost compromise. Moreover, if managers can influence their compensation by managing either accruals or real economic decisions, then manipulating accruals may result in lower wealth loss to shareholders than manipulating real activity (Field et al. 2001).

Most empirical research investigating the earnings-based compensation plans assumes that the manager's compensation is a positive linear function of reported earnings. Stated otherwise, according to this assumption, an increase in the firm's reported earnings will increase the present value of the manager's compensation. This leads to the bonus-plan hypothesis formulated by Watts and Zimmerman (1986:208): *"Ceteris paribus, managers of firms with bonus plans are more likely to choose accounting procedures that shift reported earnings from future periods to current period."* This hypothesis does not include the more complex forms of compensation plans. The bonus one year is often a function of reported earnings over a target earnings number the previous year. If earnings are less than the target, no bonus is awarded. Some compensation plans also have an upper threshold. The incentive to increase or decrease current period earnings depends on whether earnings are below the lower threshold, between the lower and the upper threshold or above the upper threshold. If earnings are above the upper threshold, the manager has incentives to reduce earnings by deferring earnings to later reporting periods. The bonus will be lost forever on earnings in excess of the upper threshold. If earnings are between the lower and the upper threshold, the managers have incentives to increase earnings to maximise the bonus. And finally, if earnings fall short of the lower threshold, the manager has incentives *to take a bath* (Healy 1985, Degeorge, Patel and Zeckhauser 1999, Gaver et al. 1995). As stated by Watts and Zimmerman (1986:210): *"It would not be very likely that managers would switch back and forth between accounting methods such as* *straight-line and accelerated depreciation since those charges are readily apparent to the compensation committee (...) Instead, accruals such as the recognition of losses (...) are more likely candidates."* Such discretionary losses could be impairment losses in goodwill. Not only big-bath accounting, but also income smoothing is suggested by the bonus-plan theory. If a lower threshold for earnings does not exist, but an upper threshold does, managers may smooth earnings towards the upper threshold.

The research findings from this literature are generally interpreted as evidence of opportunistic earnings management. For instance, Healy (1985) shows that when earnings fall between the upper and the lower threshold, managers make earnings-increasing reporting decisions. When earnings are expected to be either above the upper threshold or below the lower threshold, managers shift earnings to future periods to maximise compensation. Some studies report findings inconsistent with Healy (1985). For instance, Gaver et al. (1995) find evidence consistent with managers manipulating towards a lower threshold. They examine the relation between discretionary abnormal accruals and the bonus plan. Contrary to Healy (1985), they find that when earnings before discretionary accruals fall below the lower threshold, managers make income-increasing reporting decisions. This result is consistent with income smoothing. Holthausen et al. (1995) find evidence consistent with an upper threshold. Unlike Healy (1985), they find no evidence that managers manipulate earnings downwards when earnings fall below the minimum necessary earnings to receive a bonus (Holthausen et al. 1995). Finally, Barton (2001) reports evidence of a positive association between bonus payments and earnings management measured as abnormal accruals.

These research findings, however, may suffer from methodological problems. A common, but strongly criticised method is to use total accruals (Healy 1985) or abnormal accruals (Gaver et al. 1995, Holthausen et al. 1995, Barton 2001) as measures of earnings management. Total accruals are a very crude measure likely to reflect accruals from real economic activities just as accruals from earnings management (Dechow et al. 1995, Guay et al. 1996, Beneish 1999, 2001, Field et al. 2001). When separating out the discretionary component of total accruals, the results turn inconsistent with the findings of Healy (1985). Still, the estimation of abnormal accruals is not unproblematic. McNichols (2000) and Field et al. (2001) argue that the level and changes in abnormal accruals could just as much be evidence of actual performance as opportunistic reported performance. For instance, the very purpose of compensation contracts is to align the interest of the managers with the interests of shareholders. If the compensation contract is efficient, the observation of a given bonus payment along with a certain earnings pattern cannot serve as evidence of opportunistic earnings management: *"(...) researchers implicitly assume that managers manipulating earnings in an apparent attempt to maximize their compensation are not acting in the best interests of shareholders. If, however, the incentive compensation contract is structured to align managers interests with those of shareholders, such actions might well be beneficial to shareholders"* (Field et al. 2001). Guay et al. (1996) report evidence suggesting that the separation of total accruals into a discretionary and a non-discretionary component is most arbitrary. They compare all the conventional accrual-estimation models with one that arbitrarily separates out discretionary accruals. They find high positive correlation between the discretionary accruals in all these models. Despite the methodological challenges, abnormal accruals are still used in recent studies to indicate earnings management (e.g. Chtourou et al. 2001, Xie et al. 2003, Bradbury, Mak and Tan 2004, Vafeas

2005, Peasnell et al. 2005). Research findings from these studies will be referred to when relevant, but the findings have to be interpreted with some caution. In recent years, earnings management has been examined by alternative methods. To increase the power of the research design, specific reporting decisions rather than aggregate accruals are investigated. Some studies are also conducted on firms that are known to have managed earnings ex post.

Recent evidence has demonstrated that earnings-based compensation explains earnings management at a discount relative to equity-based incentives (Schipper and Vincent 2003, Graham et al. 2005, Yaari and Ronen 2008:80). Moreover, conditional stocks and stock options have become a major component of top management-compensation packages (Hall and Liebman 1998, Murphy 1999, Hall and Murphy 2002, Denis, Hanouna and Sarin 2006). This may suggest that earnings-based compensation is of less importance. The asset-impairment literature has to a limited extent investigated earnings-based compensation incentives. Some exceptions are found in Beatty and Weber (2006), Lapointe-Antunes, Cormier and Magnan (2008) and Ramanna and Watts (2009). Ramanna and Watts (2009) include an indicator variable for CEO cash-bonus payments. They find an insignificant association between this indicator variable and goodwill-impairment losses. Similar evidence is found by Lapointe-Antunes et al. (2008). Beatty and Weber (2006), however, report a significantly positive association between the indicator variable for bonus payment and goodwill-impairment losses.

4.3.3.2. Accounting-based debt covenants

The interest conflict is tripled in firms holding debt compared to firms holding no debt. There are potential conflicts between shareholders and debtholders, managers and shareholders and managers and debtholders (Black and Scholes 1973, Merton 1974, Jensen and Meckling 1976, Smith and Warner 1979, Leftwich 1983). As shareholders are concerned that managers are too risk-averse, the debtholders on the other hand are concerned that the shareholders are too much of a risk-taker. Debtholders prefer low-risk projects that increase the probability of debt and interests being paid. The shareholders' claim is analogous to a call option on the firm's assets with an exercise price equal to the face value of debt. The debtholders' claim, however, is analogous to a put option in that their upside is equal to the face value of debt. If the firm value falls below the face value of debt, the debtholders lose the difference between the face value of debt and the firm value (Black and Scholes 1973, Merton 1974). Shareholders can potentially transfer wealth from debtholders to themselves by investing in riskier assets than expected when the debt was issued (asset substitution). The potential of wealth transfer increases as firm value falls and the shareholders call option moves from being well in the money to being at or close to the money, and it becomes particularly actute as this option falls out of the money (Merton 1974, Kothari et al. 2010).

Debt covenants are intended and designed to restrict managers from engaging in investment and financing decisions that reduce the value of the debtholders' claim (Smith and Warner 1979, Leftwich 1983, Guay 2008). Because debt covenants frequently are written on accounting numbers and violation of these covenants are believed to be costly for the firm, managers of firms that are close to violating debt covenants are supposed to make reporting decisions that reduce the likelihood of default (Watts and Zimmerman 1986:186-91). This leads to the debt-equity hypothesis formulated by Watts and Zimmerman (1986:216): *"Ceteris paribus, the larger a firm's debt/equity ratio, the more likely the firm's manager is to select* *accounting procedures that shift reported earnings from future periods to the current period."* In more general terms, this hypothesis can be rephrased as a debt-covenant hypothesis, where managers have incentives to make reporting decisions that reduce the likelihood of debt-covenant violation (Field et al. 2001). The strength of these incentives depends on the expected costs of violation.

Debtholders will not engage in contracting unless they expect to be better off writing these contracts. If the agency costs due to opportunism are expected ex ante, Jensen and Meckling (1976) and Watts and Zimmerman (1986:189) demonstrate that these agency costs to a large extent will be borne by managers and shareholders. The debtholders will on average be price-protected, which makes contracting unnecessary. This conclusion, however, is based on the assumption that debt is traded in an efficient debt-capital market, which is generally not the case. Without efficient markets for debt, the debtholders will not be price-protected. Under such conditions, contracts serve an important role to align the interests of managers and shareholders with those of the debtholders. An efficient contract will, therefore, minimise the agency costs. If, however, the contracting and information costs are too high, the contract may turn out to be inefficient and itself provide incentives for earnings management.

The debt contracts may include different covenants. For instance, there might be covenants that constrain managers' decisions regarding dividend payouts, future debt issuances, participation in mergers and disposition of assets (Leftwich 1983, Dichev and Skinner 2002). Debt covenants can be accounting-based or non-accounting-based and will appear more often and be tighter in private rather than public debt contracts. A variety of accounting-based ratios are used to set debt covenants. Ratios such as debt-to-cash flows, debt-to-equity and interest coverage are intended to measure the firm's ability to make debt-related payments (Dichev and Skinner 2002). These covenants are calculated on current GAAP or modified GAAP (Leftwich 1983). When current GAAP is the relevant basis for calculation, accounting can either be frozen at the time of the debt issuance or be allowed to follow changes in GAAP over time.

Departures from current GAAP are quite common. Generally, these departures lead to more conservative accounting as certain increases in net earnings and net-asset values are excluded when calculating the covenants. For instance, in some contracts accounting for intangibles such as goodwill are excluded (Leftwich 1983, Holthausen and Watts 2001, Watts 2003, Beatty, Weber and Yu 2008). Debtholders are often believed to use a liquidation approach. Some assets such as goodwill are expected to have liquidation values equal to zero. This justifies exclusion of book goodwill (Holthausen and Watts 2001, Beatty et al. 2008, Kothari et al. 2010). The exclusion might also be justified on the basis of unverifiability and asset-value uncertainty (Leftwich 1983, Kothari et al. 2010). Guay (2008) find evidence consistent with book goodwill being excluded from the calculation of net-worth covenants. He argues, however, that the exclusion of intangible assets in net worth is likely to vary across firms, depending on the intensity of recognised intangible assets and the importance of intangible assets in the business model. For firms with few intangible assets, debtholders may exclude intangible assets when calculating net-worth covenants. For firms with lots of intangible assets, however, debtholders will likely include book values of these assets, if available, when calculating the covenants. There are at least two reasons why intangible assets are included. First, tangible net worth may not be a relevant metric of financial health in these firms. When a large fraction of the assets are intangible, debtholders will probably want to obtain decision rights when intangible assets are substantially impaired. Second, debtholders may have an interest in monitoring the covenant, intangible assets to tangible assets. As intangible assets are amortised or impaired over time, the firm must recoup those earnings effects in cash flows or tangible assets to avoid losing covenant slack (Guay 2008, Zang 2008). Lambert (2010) argues that all assets, also intangible assets such as goodwill, are relevant for debtholders. The reason is that all assets generate cash flows which can be used to pay off debt. He also argues that the liquidiation approach is only relevant for debtholders when firms are in financial distress. In all other situations, profitability and cash-generating capacity of the firms are of most interest.

Unfortunately, details of debt covenants are generally unavailable to researchers. Empirical tests of the debt-covenant hypothesis frequently rely on variables that are supposed to be positively correlated with debt covenants. The most frequently used indicator is the debt-to-equity ratio (Duke and Hunt 1990, Smith 1993, Dechow et al. 1996). Later research generally relies on actual covenant data (Healy and Palepu 1990, Beneish and Press 1993, Smith 1993, Sweeney 1994, Dichev and Skinner 2002). Watts and Zimmerman (1986:216) argue that the debt-to-equity ratio is a reasonable approximation of most debt covenants, as the likelihood of these other covenants being violated will increase in debt-to-equity ratio. Nonetheless, they encourage researchers to increasingly rely on details of debt covenants. Duke and Hunt (1990) examine empirically the accounting-based debt-covenant details. They find that the debt-to-equity ratio captures the most common accounting-based restrictions used in actual debt covenants. They conclude that researchers are comparatively safe to use the debt-to-equity ratio as a proxy for actual covenants. Others, however, oppose this conclusion. Dichev and Skinner (2002), for instance, argue that debt-to-equity only to a limited extent correlate with firms' actual closeness to covenant restrictions. They conclude that the debt-to-equity-ratio is a fairly noisy proxy for managers' reporting incentives triggered by debt covenants. Despite the mixed evidence on the validity of the debt-to-equity ratio, this proxy is widely employed in the asset-impairment literature (Lo and Tan 2002, Segal 2003, Sellhorn 2004, Kvaal 2005, Lapointe-Antunes et al. 2008, Zang 2008).

The incentives to avoid covenant violations will be a function of the probability of violation and the expected default costs imposed on the firm given violation. The probability of violation will be determined by the debt-covenant slack and the choices made regarding the calculation of the debt covenant (Dichev and Skinner 2002). The expected default cost is in focus here. If a firm is technically default, this may result in significant default costs (Sweeney 1994). Beneish and Press (1993) demonstrate that the cost associated with technical defaults is quite significant. They estimate that refinancing costs resulting from interest-cost increases vary from 0.84% to 1.63% of the market value of the borrower's equity. Gopalakrishnan and Parkash (1995) identify six potential debtholder responses to covenant violations: termination of the debt contract, demand for immediate repayment, increased collateral, increased interest rate, imposition of additional covenant constraints and a waiver. Immediate repayment is rare. The common response is a waiver. Dichev and Skinner (2002) for instance, demonstrate that violations occur rather frequently. They find that approximately one-third of the loans violated covenants. In addition, most loans with debt covenants had multiple violations. The same results are also demonstrated by Gopalakrishnan and Parkash (1995). Both lenders and borrowers indicated a waiver as the most likely response to the violation of an accounting-based debt covenant. This suggests that other information sources than financial statements are used to decide whether to waive or not (Lambert 2010). Still, a violation will likely impose some default costs on the firm.

This provides the managers and shareholders with incentives to try to avoid violations by making earnings-increasing reporting decisions. Sweeney (1994) examines the time series of reporting decisions prior to firms violating accounting-based debt covenants. She investigates whether managers change accounting methods, which type of accounting methods managers change, when they make these changes and to what extent these changes affect the restrictiveness of accounting-based covenants. Her findings demonstrate that firms approaching violations of accounting-based covenants are more likely to make earnings-increasing accounting changes and early adopt earnings-increasing mandatory accounting changes relative to a sample of control firms matched on industry and size. Beneish and Press (1993) find evidence in line with Sweeney (1994). They find that debt-covenant violators make earnings-increasing reporting decisions in the year of violation and up to five years prior to the violation. Using accrual-estimation models for investigating earnings management, DeFond and Jiambalvo (1994) find that managers use discretionary accruals to avoid debt-covenant violations. They examine firms that report debt-covenant violations in their financial statement, and their findings suggest that there are positive discretionary accruals in the year prior to the violation and the year of the violation. Some evidence, however, contradicts these findings. DeAnglo, DeAnglo and Skinner (1994) argue and find evidence inconsistent with the debt-covenant hypothesis. They state that *"(...) managers of troubled firms have incentives to take discretionary write-offs that signal to the lenders their willingness to acknowledge and deal with the firm's problems"* (DeAnglo et al. 1994:134). They find that in the year of the dividend reduction 40 out of 76 firms report impairment losses or restructuring charges. The incentives to do so are found in the desire to affect the renegotiation outcomes. More than 87% of the firms were renegotiating contracts with lenders or labour unions, had changes in top management and/or lobbied for governmental support, all of which plausibly motivated managers to reduce reported earnings. In contrast, Dichev and Skinner (2002) find a significantly higher proportion of firms reporting accounting numbers slightly above current ratio and tangible-net-worth constraints. Taken together, it is reasonable to predict that managers make reporting decisions to avoid covenant violations.

4.3.4.Political-cost incentives

Accounting information is frequently used by politicians and bureaucrats to determine the direction and amount of wealth transfer. This gives rise to other earnings-management incentives than those related to formal and explicit accounting-based contracts. The incentives stem from the fact that accounting information, e.g. earnings, may influence the degree to which firms are subject to potentially adverse regulation and increased taxation. First, the amount of profit in certain industries might be restricted ex ante by regulation based on accounting numbers. Second, adverse economic consequences for politically visible firms are assumed to arise ex post from their accounting numbers such as earnings (Watts and Zimmerman 1986:115). Several regulated industries, for instance the oil and gas industry in the US, have been investigated in political-cost studies. In these industries firms' profits are restricted to some fair rate of return-on-assets estimated as weighted-average cost of capital (Hall 1993, Han and Wang 1998). Accounting numbers are expected to determine a firm's political visibility, i.e. the likelihood of adverse regulation and increased political costs. Obscenely high earnings generally indicate monopoly profits or windfall profits. Such earnings, along with large fluctuations in earnings, increase the likelihood of adverse regulation (Watts and Zimmerman 1978, 1986, 1990, Moses 1987).

Researchers have tried to increase the power of their empirical tests by focusing on specific settings in which firms' political-cost incentives are supposed to be particularly strong. Such settings, signalled by high earnings reported by certain firms, are perceived in the political process as potential crises that must be overcome with additional regulation (Cahan 1992, Han and Wang 1998). The likelihood of increased political costs has frequently, especially in earlier research, been assumed to increase in the size of the firm. This leads to the prediction that large firms relative to small firms are more inclined to use earnings management to reduce reported earnings. This is known as the size hypothesis in positive-accounting theory: *"Ceteris paribus, the larger the firm, the more likely the manager is to choose accounting procedures that defer reported earnings from current to future periods"* (Watts and Zimmerman 1986:235). The size proxy, however, has been criticised for being crude, since it is not explicitly linked to political costs per se (Ball and Foster 1982, Watts and Zimmerman 1990). According to Ball and Foster (1982), size may proxy for a variety of other aspects of the firm, including industry membership. Despite the criticism, Watts and Zimmerman (1990) conclude that no alternative theories explain the empirical regularity that large firms tend to make earnings-decreasing reporting decisions. Along with size, variables supposed to reflect monopoly rents such as the firm's market power are used to proxy for political-cost incentives (Moses 1987, Gupta 1995). The political-cost hypothesis is rarely tested in the asset-impairment literature. Francis et al. (1996) for instance, include firm size, measured as the log of total sales, as an independent variable. However, that variable is not intended to reflect political-cost incentives. It is simply a control variable.

4.3.5. Equity-based incentives

Earnings management is often driven by other incentives than those from political costs and accounting-based contract (Fischer and Verrecchia 2000, Fischer and Stocken 2004). These other incentives are generally termed *equity-based incentives* or *capital-marked based incentives.* Equity-based incentives emerge as a result of capital-market imperfections, that is, less than semi-strong capital markets (Field et al. 2001). Without market imperfections, earnings management will not have any effect on the market perception of the firm (Watts and Zimmerman 186:198). The importance of equity-based incentives has increased relative to political cost and accounting-based contracting incentives (e.g. Graham et al. 2005). The main reason is that stocks, conditional stocks and stock options have become an increasingly important part of managers' total compensation (e.g. Hall and Liebman 1998, Murphy 1999, Hall and Murphy 2002, Hall 2003, Denis, Hanouna and Sarin 2006).

4.3.5.1. Equity-based compensation and managers' reputation

Equity-based compensation is, like earnings-based compensation, intended to motivate the managers to make decisions that maximise firm value and shareholders' wealth. Stocks and stock-option holdings, in particular, are seen as important mechanisms to align managers' interests with those of the shareholders and thereby reduce agency costs (Jensen and Meckling 1976, Burns and Kedia 2006, Johnson, Ryan and Tian 2009). They are considered to be important corporate-governance mechanisms. Stock options, for instance, will impose higher-level risk on the managers. Stock options are only valuable if the stock price has risen when exercised. A manager that is reluctant to bear personal risk will still make decisions that are expected to maximise the firm value (Ronen and Yaari 2008:54-83). For instance, Morgan and Poulsen (2001) find empirical evidence supporting a positive effect of stock options on firm value. Conversely, equity-based compensation contracts such as conditional stocks and stock options might be inefficient in aligning the interest of the managers with those of the shareholders. In such cases these contracts could themselves lead to opportunism (e.g Gao and Shrieves 2002, Denis et al. 2006, Erickson et al. 2006, Burns and Kedia 2006, Johnson et al. 2009).

The earnings number may affect equity-based compensation in two ways. Under less than semi-strong efficiency, capital markets may not be able to undo the effects of earnings management. This implies that earnings management might affect the value of stocks, conditional stocks and stock options. Earnings management may also affect metrics, such as stock returns, used to determined conditional stock and stock-option awards. In some cases, these awards are determined by a weighted stock-based and accounting-based metric, for instance, stock returns and earnings-per-share. In such cases, the awards might be affected directly through earnings-per-share and indirectly through altered stock prices.

The literature demonstrates a positive association between managers' stock-option holdings and earnings management. For instance, Gao and Shrieves (2002) find that the number of stock options is positively related to the intensity of earnings management as measured by abnormal accruals. Denis et al. (2006) and Erickson et al. (2006) find that the likelihood of being accused of fraud increases in the amount of stock compensation, in the percentage of total executive compensation being stock-based and in the sensitivity of managers' stock-based wealth to changes in stock prices. Burns and Kedia (2006) further document that the sensitivity of the CEOs' stock-option portfolios to stock price is significantly positively associated with the propensity to engage in opportunistic earnings management. They do not find, however, that other components of CEO compensation, i.e. stocks, restricted stocks or bonus payments, have any significant impact on the propensity to misreport.

The asset-impairment literature has to a limited extent investigated equity-based inventives. There are, however, some recent exceptions. Lapointe-Antunes et al. (2008) investigate the association between stock options and goodwill-impairment losses. They argue that the likelihood of stock-option awards and the value of stock-option holdings will increase when stock prices increase. Given that impairment losses have the potential to negatively affect stock prices, it is expected that managers will understate impairment losses. Consistent with their hypothesis, they find a negative association between stock options and goodwill-impairment losses (impairment losses take positive values). Ramanna and Watts (2009) use the earnings-response coefficient to investigate equity-pricing concerns. They argue that non-impairment decisions are more likely for firms having higher earnings-response coefficients. They find, however, no significant association between earnings-response coefficients and impairment decisions.

Equity-based incentives may also arise absent equity-based compensation. Managers of growing firms are likely to obtain a sense of status and prestige from the size and growth of the firm, which increase their own market value as a manager. A growing firm will also reduce the manager's risk of dismissal (Fama and Jensen 1983). Managers' reputation concerns have in recent years been considered an important explanation for the managers' reluctance to report impairment losses. For instance, Beatty and Weber (2006) and Ramanna and Watts (2009) argue that managers' tenures are important to explain the tendency to understate impairment losses in goodwill. The longer the tenure, the more likely it is that the manager reporting the goodwill impairment was in charge at the time when goodwill was recognised. Beatty and Weber (2006) and Ramanna and Watts (2009) find that tenure significantly explains the impairment decisions and the size of the reported impairment losses.

Overall, both equity-based compensation and enhanced reputation give rise to incentives to achieve a steady growth in stock prices. The following sections discuss three reporting patterns: income smoothing, target accounting and big-bath accounting. All these three reporting patterns might be explained by accounting-based contracting incentives (e.g. Healy 1985). In recent years, however, these reporting patterns have been addressed to equity-based incentives (Sellhorn 2003).

4.3.5.2. Income smoothing

Income smoothing is a reporting activity which seeks to reduce the variability of earnings (Moses 1987, Hunt, Moyer and Shevlin 1997, Kirschenheiter and Melumad 2002). For instance, Zucca and Campbell (1992:35) state that *"[i]ncome smoothing describes an earnings pattern in which management aspires to maintain a steady and predictable rate of earnings growth."* Rather than being an earnings-management incentive, income smoothing is an earnings pattern like target accounting and big-bath accounting, reflecting some reporting incentives. Two types of income smoothing can be found: artificial and real income smoothing. The latter type is considered outside the definition of earnings management in this dissertation. This type of income smoothing involves financing and investment decisions that reduce the variability of economic earnings. Artificial income smoothing can be separated into intertemporal smoothing and classificatory smoothing (Lambert 1984). Intertemporal smoothing involves shifting gains and losses between reporting periods to reduce reported earnings in periods with above expected earnings and increase reported earnings in periods with below expected earnings. Classificatory smoothing deals with the presentation of reported earnings. Given the assumption that shareholders concentrate on earnings from continuing operations, components of earnings that are incompatible with the smoothing strategy are classified as non-recurring earnings. Under IFRS, such classification is difficult, since there is no room for extraordinary items on the profit and loss account.

A smooth earnings stream is assumed to be desirable to managers, shareholders and debtholders. Shareholders and debtholders may interpret a steady earnings stream as low risk, which justifies a higher stock price and a lower interest rate on debt. The sideeffects could be higher earnings-based compensation and lower risk of dismissal (Trueman and Titman 1988, Barth, Elliot and Finn 1999, Kirschenheiter and Melumad 2002). Empirical evidence supports this notion by demonstrating positive associations between earnings variability and measures of total risk and systematic risk (e.g. Beaver, Kettler and Scholes 1970, Rosenberg and McKibben 1973, Lev and Kunitzky 1974, Bildersee 1975, Eskew 1979, Brimble 2003). Income smoothing might also be triggered by political-cost considerations. Large fluctuations in earnings may attract attention of politicians and bureaucrats. Large upward fluctuations in earnings might be interpreted as monopolistic profits as large downward fluctuations may signal crisis and cause regulators to act (Moses 1987).

Income smoothing can be a non-opportunistic or an opportunistic reporting strategy. Beneficial smoothing means that managers use smoothing to signal the economic earnings stream and the risk of that earnings stream. Signalling means that the managers use its discretion to indicate future prospects of the firm; thereby increasing the predictive ability of the earnings stream. Higher variability in earnings, that is, higher perceived risk implies lower market value of the firm. Both analytical and empirical evidence support this. Trueman and Titman (1988) demonstrate analytically that income smoothing can increase the market value and be non-opportunistic towards the interests of shareholders, but opportunistic towards the interests of debtholders. As summarised in their study: "*A corporate manager may rationally want to smooth reported income - namely to lower claim holders' perception of the variance of the firms' underlying economic earnings. In turn, it was shown that such action could have a positive effect on the firm's market value"* (Trueman and Titman 1988:139-40). Similar analytical results are demonstrated by Sankar (1999), Sankar and Subramanyam (2001) and Kirschenheiter and Melumad (2002). Sankar (1999) investigates the impact of earnings management on the earnings-response coefficients. He demonstrates that earnings-response coefficients are higher if the earnings surprises are small. This suggests that the positive effect of income smoothing on the usefulness of earnings is not caused by private information in this model. It is simply driven by a more precise earnings number. Sankar and Subramanyam (2001) find similar analytical evidence when managers use their private information to smooth the earnings stream. Kirschenheiter and Melumad (2002) demonstrate analytically that both income smoothing and big-bath accounting could be a non-opportunistic reporting strategy.

Subramanyam (1996) reports empirical evidence consistent with income smoothing. He finds that the variance of net earnings is significantly smaller than the variance of non-discretionary accruals and cash flows. Hunt et al. (1997) investigate income smoothing by testing the value relevance of different sources of smoothing: variability of cash flows, variability of discretionary accruals and variability of non-discretionary accruals. Their results reveal that the discretionary smoothing variable is significantly positive, which suggests that income smoothing increases the informativeness of earnings. The association between earnings variability and market value differ for non-discretionary and discretionary accrual-components of earnings variability. For a given earnings level, smoother earnings are associated with higher market value. Zarowin (2002) investigates whether income smoothing makes stock prices more informative. He uses two smoothing measures, namely the correlation between changes in accruals and cash flows and the dispersion in net earnings scaled by the dispersion in cash flows. He then regresses current stock returns on lagged, current and future earnings (cash flows) and finds that stock returns of firms with more smoothing capture more information about future earnings (cash flows).

Income smoothing may also be seen as an opportunistically reporting strategy (Ball and Foster 1982). Cheng and Warfield (2005) examine the income-smoothing hypothesis along with the target-accounting hypothesis. Managers may engage in income-decreasing activities in periods with good performance in order to increase earnings in future periods. Such income smoothing increases the likelihood of meeting analysts' forecasts in the future. Consistent with this argument, they find evidence suggesting that high equity-incentive managers are less likely to report large positive earnings surprises compared to those with low equity incentives. This is consistent with opportunistic earnings management. In the asset-impairment literature, the income-smoothing hypothesis has been popular. Zucca and Campbell (1992), Francis et al. (1996), Segal (2003), Riedl (2004) and Lapointe-Antunes et al. (2008) examine income smoothing when reporting impairment losses. The empirical results from these studies are somewhat mixed and will be discussed at the end of this chapter.

4.3.5.3. Target accounting

Target accounting is a reporting activity concerned with the level of earnings rather than the variability of earnings (Ronen and Yaari 2008:135). Target accounting, known as the *numbers game*, is heavily criticised by regulators (e.g. Levitt 1998) and is considered among managers to be important determinants of reported earnings. The results from a survey among managers suggest that meeting and beating earnings targets are extremely important (Graham et al. 2005). Managers describe a trade-off between the short-term need to deliver earnings and the long-term objective of making value-maximising investment decisions. Managers are primarily interested in meeting or beating earnings targets. Bonus plan, debt covenant and political-cost concerns are less important. Graham et al. (2005) report that 85.1% of the managers consider meeting or beating the earnings number reported the same quarter last year as important. Similarly, meeting analysts' consensus forecasts is considered important by 73.5%, reporting positive earnings is important by 65.2% and meeting previous quarter's earnings-per-share is considered important by 54.2% of the managers (Graham et al. 2005:29).

The target-accounting literature examines whether earnings are indeed managed with respect to certain targets, why these targets appear to be important, whether target accounting varies across firms and whether *making the numbers* (failing to *make the numbers*) is rewarded (penalised) by the capital market. Anecdotal as well as systematic evidence suggests that managers do manage earnings to meet or beat different types of targets (Burgstahler and Dichev 1997, Myers, Myers and Skinner 2006). While some of these targets such as analysts' forecasts or management's forecasts are direct proxies for shareholders' expectations, others are not. For instance, targets such as last year's annual earnings or last quarter's earnings are not directly linked to such expectations. Degeorge et al. (1999:1) argue that there is a hierarchy of targets: *"[It] is important first to make positive profits, second to report quarterly profits at least equal profits of 4 quarters ago, and third to meet analysts' expectations."* The first target, to report positive earnings, arises from the psychologically important distinction between positive earnings numbers and negative earnings numbers. Their findings clearly demonstrate that earnings management is driven by these targets: reporting small positive earnings, meeting and sustaining recent performance and meeting analysts' forecasts. Other researchers have reported similar results. Hayn (1995) finds an unexpected concentration of small above-zero earnings, suggesting that earnings are managed to avoid losses. Burgstahler and Dichev (1997) report a similar concentration, using annual earnings. They all conclude that earnings management is used to avoid losses.

The importance of earnings targets is intuitive when targets proxy for the expectations of market participants. This is especially true if the information costs are assumed to be high. Under such conditions, shareholders are expected to rely on earnings-based heuristics such as analysts' forecasts to assess firm performance. However, it is less clear why meeting and beating simple targets such as zero earnings, prior year's earnings or round numbers is important. It is claimed that managers *"(...) focus on thresholds for earnings because the parties concerned with the firm's performance do"* (Degeorge et al. 1999:5). For instance, shareholders tend to increase their monitoring activities when a loss or a decline in earnings is reported, which imposes costs on the managers in the form of reduced compensation and an increased probability of dismissal.

Another question is whether the capital market rewards this purely "cosmetic" reporting strategy. Barth, Elliot and Finn (1999) find that firms with a history of earnings increases have higher price-earnings multiples than other firms. Similarly, DeAnglo, DeAnglo and Skinner (1996) find that breaking a string of increasing annual earnings triggers a significantly negative abnormal stock return. Similar results are reported by Myers et al. (2006) for quarterly earnings. This provides managers with strong incentives to maintain and increase reported earnings. Burgstahler and Dichev (1997) predict and find that the marginal benefits of earnings management are especially high around zero earnings. Similar findings are also reported for meeting and beating analysts' forecasts. Bartov, Givoly and Hayn (2002) document that positive quarterly-forecast errors are associated with higher returns, even when the earnings surprise has apparently been achieved by either earnings or managers' own forecasts. Significant negative responses to even small earnings disappointments are found by Skinner and Sloan (2002) and Kinney, Burgstahler and Martin (2002). The common belief is that a well-run and stable firm should be able to *produce the numbers* necessary to meet the earnings target even in a year that is otherwise down. If the firm does not manage to report such earnings, this is taken as a signal that the firm is heavily distressed (Graham et al. 2005).

4.3.5.4. Big-bath accounting and management change

Big-bath accounting has been widely investigated by researchers (Strong and Meyer 1987, Elliot and Shaw 1988, Francis et al. 1996, Cotter, Stokes and Wyatt 1998, Kirschenheiter and Melumad 2002, Riedl 2004, Kvaal 2005, Beatty and Weber 2006, Lapointe-Antunes et al. 2008, Zang 2008). The big-bath hypothesis suggests that managers are inclined to report excessive losses in periods where earnings fall well below the earnings target. This is based on an assumption that shareholders do not fix mechanically on the reported earnings number as under target accounting, but carefully evaluate the implications of current earnings for the firm's future prospects, even if that implies ignoring large one-time losses such as impairment losses. Given this assumption, managers can sell a large and possibly overstated loss as *good news*. Healy (1985) argues and provides evidence that managers *take a bath* when earnings fall well below the lower threshold in their bonus plan. Big-bath accounting is not limited, however, to thresholds in bonus plans, but is expected to occur when earnings fall short of any threshold, e.g. analysts' forecast or last year's annual earnings (Degeorge et al. 1999, Gaver et al. 1995). By engaging in big-bath accounting, the managers build up reserves for future periods by accelerating and/or overstating losses making it more likely that the threshold will be met in the future. Moreover, it is believed that the marginal costs associated with falling short of earnings targets will decline in the amount of the deficit. This means that the costs of taking a big bath by reporting an overstated loss are only slightly higher than the costs of disappointing shareholders by a narrow margin, which makes it rational for managers to reserve earnings for future periods by overstating losses.

Big-bath accounting has generally been related to CEO changes. The preceding CEO is supposed to have incentives to smooth or maximise earnings (Dechow and Sloan 1991). The evidence, however, is mixed and is potentially driven by an inappropriate separation of forced CEO departures driven by poor performance and peaceful CEO departures (Ronen and Yaari 2008:99). Dechow and Sloan (1991) find evidence that the departing CEO is managing earnings upwards to increase bonus payments. Conversely, Pourciau (1993) finds evidence suggesting that the departing CEO reports impairment losses that decrease earnings in his last year as a manager. The incoming CEO, however, is believed to have incentives to *take a bath* (Strong and Meyer 1987, Elliot and Shaw 1988, Francis et al. 1996, Cotter et al. 1998, Riedl 2004, Kvaal 2005, Beatty and Weber 2006, Lapointe-Antunes et al. 2008:41, Zang 2008). Low earnings the first year might be blamed on the preceding manager. The excessive losses could be seen as a signal that worst is over, the *desks are cleaned* and a strategic reorientation is implemented, which suggests that the problems left behind by the preceding manager are dealt with. The incoming CEO is pressured to show results and the sooner the better. Large impairment losses the first year will establish a low earnings and net-asset base, which increases the probability of reporting a growth in earnings and net-asset values in the future. An alternative argument suggests that the positive association between losses and management change may reflect true economic changes as opposed to managerial opportunism as the incoming manager may exercise greater scrutiny over existing assets or change the firm's strategic focus resulting in impairment losses (Wilson 1996, Francis et al. 1996, Riedl 2004). A final argument suggests that the management change is a consequence of poor firm performance, which necessitates impairment losses (Murphy and Zimmerman 1993, Fields et al. 2001). The empirical evidence on the big-bath hypothesis is mixed (e.g. White, Sondi and Fried 2003: 60, 278-9). While some researchers report negative associations between impairment losses and unexpected negative earnings suggesting big bath (Riedl 2004), others do not find such associations (Segal 2003). Moreover, some evidence suggests that impairment losses rather are understated than overstated. For instance, Elliot and Hanna (1996) and Francis et al. (1996) document that a reported impairment is rarely a one-time event, but is often followed by several impairment losses reported in sequence.

4.4. Corporate governance and earnings management

This part of the chapter discusses evidence on corporate governance, accounting quality and earnings management. The focus will be on board and audit-committee characteristics and other monitoring mechanisms. Literature on external audit quality is relevant, but is excluded from the below literature review in order to maintain a narrow focus of this dissertation.

4.4.1. Corporate governance and earnings management – introduction

Corporate governance deals with the rights and responsibilities of managers, board of directors, shareholders and other stakeholders of the firm (e.g. Brickley and Zimmerman 2010). It is an instrument to reduce the risk of opportunism in principal-agent relations (Shleifer and Vishny 1997, Armstrong et al. 2010). The firm can be seen as a hierarchy of principal-agent relationships between the shareholders and the board of directors and between the board of directors and the managers. The shareholders act as a principal to the board. The board is an agent of the shareholders and principal of the managers, and finally, the managers are an agent of the board and the shareholders. The principal-agent problem of managers and shareholders is generally explained by the separation of ownership and control. Managers have an information advantage compared to shareholders. Managers and shareholders are also believed to have different interests, different risk attitudes and different time horizons (Dey 2008, Armstrong et al. 2010). This makes the manager-shareholder relationship particularly challenging.

Corporate governance is based on contracting and monitoring devices (Shleifer and Vishny 1997). Efficient corporate governance is supposed to constrain managers' opportunism and restrict their ability to engage in opportunistic earnings management (Dechow et al. 1996, Cohen, Krishnamoorthy and Wright

2004). The optimal set of corporate-governance mechanisms will probably vary across firms due to the firms' economic characteristics (Armstrong et al. 2010). This suggests that a corporate structure, which is optimal for one firm, is not necessarily optimal for other firms.

Two lines of literature investigate corporate governance in relation to accounting. One line demonstrates that corporate-governance mechanisms improve the quality of accounting measured as the information content and accrual quality of earnings. For instance, Warfield et al. (1995) document that increased managerial ownership improves the informativeness of earnings. Others such as Anderson et al. (2004) argue that efficient corporate-governance mechanisms reduce the noise in earnings and thereby increase the earnings-response coefficients. They find that the informativeness of earnings improves with increased board activity and more board independence. Similar findings are reported for audit-committee activity and audit-committee independence. And finally, Doyle et al. (2007) and Kent, Routledge and Stewart (2010) report a positive association between corporate governance and accrual quality.

A complementary line of literature provides evidence that firms with stronger corporate governance are less likely to engage in earnings management (e.g. Warfield et al. 1995, Dechow et al. 1996, Beasley 1996, Chtourou et al. 2001, Klein 2002, Koh 2003, Xie et al. 2003, Peasnell, et al. 2005, Davidson et al. 2005, Mulgrew and Forker 2006, Ebrahim 2007, Koh, LaPlante and Tong 2007). For instance, Dechow et al. (1996) investigate firms subject to accounting-enforcement actions by SEC for reporting overstated earnings. They document that firms manipulating earnings are more likely to have boards dominated by management, more likely to have a CEO who simultaneously serves as a chairman of the board (COB), less likely to have an audit committee and less likely to have outside blockholders. Chtourou et al. (2001) investigate the association between corporate-governance mechanisms and abnormal accruals. They report that firms with audit committees with at least one financial-accounting expert, high proportion of independent non-executive directors and with a clear mandate for oversight and monitoring of accounting preparation are significantly less likely to have high levels of abnormal accruals. Xie et al. (2003) demonstrate similar evidence for the composition and the activity of the board and the audit committee. Firms with higher proportions of independent non-executive directors and higher meeting frequency are associated with lower abnormal accruals. As demonstrated above, the literature investigating corporate governance and earnings management generally relies on accrual-estimation models to determine the portion of total accruals that is abnormal and indicative of earnings management. As demonstrated in section 4.3.3.1 above, these estimation models are highly criticised (e.g. McNichols 2000, Field et al. 2001). At best these models estimate earnings management with non-substantial errors, but at worst these models arbitrarily separate total accruals in abnormal and normal accruals (Guay et al. 1996). Some of these findings should, therefore, be interpreted with caution.

There are a large number of indicators supposed to reflect corporate-governance mechanisms. For instance, Larcker, Richardson and Tuna (2007) discover no less than 39 indicators employed in the literature. In this subchapter, the corporate-governance mechanisms are structured into board and audit-committee characteristics and other monitoring mechanisms. Compensation contracts and debt contracts are also potential corporate-governance candidates (Dey 2008). These contracts are indeed established to align the interests of managers, shareholders and debtholders. When efficient contracting is feasible, they will reduce agency costs. Under inefficient contracting, however, they might motivate rather than prevent opportunism (Watts and Zimmerman 1990:136, Xie et al. 2003). Still, it is argued that corporate-governance structures, such as independent board members, have the potential to be better at reducing opportunism than contracts written directly or indirectly on accounting numbers such as compensation contracts. The formal contracts are often narrow in scope and incomplete, which makes them inefficient to motivate and regulate managers' actions in all potential states the firm might face (Armstrong et al. 2010). This will probably make such contractual arrangements less efficient than other corporate-governance mechanisms. Taken together with the extensive literature discussed in this chapter, suggesting that these contracts are inefficient, compensation contracts and debt contracts are considered as potential sources of earnings-management incentives rather than corporate-governance mechanisms.

4.4.2. Board size

The number of directors is expected to influence the efficiency of the board. The UK Combined Code (FRC 2003:6, 2008:7) states that *"[t]he board should not be unwieldy. The board should be of sufficient size that the balance of skills and experience is appropriate for the requirements of the business (...)."* The board size is to some extent determined by the size of the firm and the complexity of the firm's operations. A larger firm with more complex operations will require a more diverse expertise which demands more directors. Besides, the combined codes require that at least half of the board members are independent non-executive directors (e.g. FRC 2003:7, 2008:8, NYSE 2003:4). This requirement has in recent years increased the average board size (Linck, Netter and Yang 2006).

The common wisdom is that smaller boards are more efficient (Lipton and Lorsch 1992, Yermack 1996, Jensen 2000) and less likely to be controlled by managers (Dechow et al. 1996, Core, Holthausen and Larcker 1999, Jensen 2000). Lipton and Lorsch (1992) and Jensen (2000) recommend an optimal board size of seven or eight directors. Blair (1995) argues that a board larger than 15 members is likely to waste time because a typical board meeting will last more than four hours. The free-rider problem may explain some of the inefficiency of large boards. As the number of board members increases, the burden of responsibility for each director is less strongly felt, which makes the board less efficient (Ronan and Yaari 2008: 244). Consistent with this notion, the literature demonstrates a negative association between board size and firm performance, where performance is measured as Tobin's Q, return-on-assets, sales-to-asset ratio or other performance measures (e.g. Yermack 1996, Mak and Kusnadi 2002, Ødegaard and Bøhren 2004).

The relationship between earnings management and board size, however, is not easily understood. If smaller boards are more efficient, it is reasonable to predict a positive association between board size and earnings management. However, larger boards will probably comprise more independent non-executive directors. This suggests a negative association between board size and earnings management (e.g. Xie et al. 2003, Ebrahim 2007). Evidence consistent with both predictions is found in the literature. Chtourou et al. (2001) document a significantly negative relationship between board size and abnormal accruals. Similar results are reported by Xie et al. (2003) and Bradbury et al. (2004). The literature has also found evidence of no or a weak association between board size and earnings management (e.g. Dechow et al 1996, Abbott, Parker and Peters 2000, Vafeas 2005). This is the case if the board is nothing but a façade. And finally, the literature has also demonstrated evidence that firms with larger boards are associated with more earnings management (Harris and Raviv 2008). The majority of previous studies report evidence consistent with smaller boards being more efficient monitors than larger boards. This suggests a negative association between board size and earnings management.

4.4.3.Board activity

Board activity is supposed to be indicated by number of board meetings. More board meetings suggest higher activity and less earnings management. This rests on the notion that more active boards are more efficient to prevent managerial opportunism (e.g. Xie et al. 2003). Some studies demonstrate a negative association between board meetings and abnormal accruals (e.g. Xie et al 2003). Anderson et al. (2004) find that the information content of earnings increases in board activity. They report that higher board activity leads to stronger market responses to a given level of unexpected earnings. Others, however, report evidence inconsistent with these findings. Vafeas (1999), for instance, report a negative association between board activity and firm value, and Davidson et al. (2005), Ebrahim (2007) and Koh et al. (2007) find a positive association between board activity and earnings management. These findings, however, can be driven by correlated-omitted variables and endogeneity problems. Number of board meetings could be an indicator of the board's response to urgent business or performance circumstances. Given that the firm is financially distressed, it is likely that board activity will increase in terms of board meetings. Due to the distress, the firm value will fall and the incentives to engage in income-increasing earnings management will probably increase. This could explain a negative association between board activity and firm value and a positive association between board activity and earnings management. Given proper control for these circumstances, a negative association is predicted between board meetings and earnings management.

4.4.4.Board composition and independence

Composition and independence of the board are critical for its efficiency. Fama (1980) and Fama and Jensen (1983) argue that the composition of board members is an important factor in creating a board that is efficient in monitoring managers' decisions. In the principal-agent framework, outside directors[12] are believed to have incentives to avoid colluding with managers because the value of their human capital is partly determined by their monitoring performance. As outside directors generally are managers or important decision makers in other firms, they may use their directorships to signal to external markets for decision makers that they are decision experts, they understand the importance of decision control and they work with such decision-control systems (Fama and Jensen 1983, Beasley 1996). This suggests that the inclusion of outside directors increases the likelihood that the board will maintain its monitoring function and decreases the likelihood of board members colluding with managers against shareholders' interests.

Three board characteristics are supposed to reflect board independence: the proportion of independent non-executive directors, chairman and CEO being separate and CEO being the founder of the firm. Other characteristics are also supposed to reflect independence such as the presence of an independent nomination committee (e.g. Chtourou and Bebard 2001) and an independent audit committee (Klein 2002, Xie et al 2003, Peasnell et al. 2005). The board is believed to comprise three types of directors: executive directors, independent non-executive directors and affiliated non-executive directors (Beasley 1996, Klein

[12] The concept *outside directors* does not distinguish between independent and affiliated directors.

2002, Vafeas 2003, Xie et al. 2003, Mulgrew and Forker 2006). Independent non-executive directors are directors without any affiliation with the firm other than being on its board. Affiliated directors are non-executive directors, but they are not considered independent. They are related to the firm as suppliers, consumers, employees of affiliated firms or as consultants, lawyers, investment bankers or as former executive directors. These directors are kind of a hybrid as they are less likely to monitor managers than independent directors. The UK Combined Code (FRC 2003:7, 2008:8) provides a list of indicators that is helpful in identifying an inside director (executive or affiliated): the director has been an employee within the last five years, has had a material business relationship to the firm within the last three years, has received stock options or performance-related payments, has close family ties to managers or directors, represents a significant shareholder or has severed on the board for more than nine years. Some studies merge non-executive directors and independent directors (e.g. Beasley 1996, Dechow et al. 1996). Recent studies, however, recognise the important distinction between independent directors and affiliated directors and therefore, indentify three different types of directors (e.g. Chtourou et al. 2001, Klein 2002, Vafeas 2003, Xie et al. 2003, Mulgrew and Forker 2006).

It is useful to look at the relationship between board independence and firm performance when discussing board independence and earnings management. Some studies support the regulators' view that independent directors improve the alignment between managers' and shareholders' interests (e.g. Weisbach 1988, Huson, Parrino and Starks 2001, Perry and Perry 2005, Perry and Shivdasani 2005). Weisbach (1988) and Huson et al. (2001) find that poorly performing managers generally are removed if the boards have a majority of independent directors. Similarly, Perry and Shivdasani (2005) find that such boards are less reluctant to make painful decisions on restructuring, redundancy and asset sales. Some studies, however, report no association between board independence and firm performance (e.g. Klein 1998, Core et al. 1999, Bhagat and Black 2002, Adams and Mehran 2005). Others find a significantly negative association between board independence and firm performance (e.g. Agrawal and Knoeber 1996). There are several explanations for no relation or a negative relation between board independence and firm performance. One explanation is that firms balance the advantages (i.e. tighter monitoring) and disadvantages (i.e. higher information costs) when deciding the board composition. For instance, biotechnology firms may prefer less board independence because the cost of conveying technical information to independent directors is very high, whereas food-processing firms may prefer greater board independence because information costs in this industry are rather low (Ronan and Yaari 2008:252). Another explanation is that the board is controlled by managers and not the other way around. Monks and Minow (2004) report on interviews with nomination-committee members. The interviews reveal that board members usually consult managers about nominees of independent directors. Monks and Minov (2004:36) state that *"[i]ndependent directors are an oxymoron because they are a group of self-selecting people. Having the status as a director is important to people. They are loyal to the rules of the club rather than to shareholders. If an independent director is bumptious or truly independent then they won't get work."* A final explanation is that the relationship between board composition and firm performance might be non-linear. For instance, Block (1999), who studies 1026 appointments of independent directors, finds that although the stock price responds favourably to the appointment of an outside director, this effect disappears beyond a certain limit of outside directors (more than 60%).

The above evidence questions whether outside directors improve the monitoring capabilities of the board. Still, the association between board independence and earnings management is predicted to be negative. This is based on the notion that a higher proportion of independent directors makes the board more efficient in monitoring the managers and thereby constrains the opportunities for managerial opportunism (e.g. Xie et al. 2003). Several studies have also demonstrated a negative association between independence and earnings management (e.g. Beasley 1996, Dechow et al. 1996, Klein 2002, Xie et al. 2003, Farber 2005, Vafeas 2005, Peasnell et al. 2005, Davidson et al. 2005, Ebrahim 2007, Koh et al. 2007). Beasley (1996) compares a sample of 75 firms accused of financial fraud to a control sample of non-fraud firms. He reveals that higher proportions of non-executive directors reduce the likelihood of financial fraud. In a similar vein, Dechow et al. (1996) report that firms are more likely to commit fraud when the board lacks a simple majority of outsiders. Klein (2002), Xie et al. (2003) and Ebrahim (2007) find evidence of a negative association between the proportion of independent directors and abnormal accruals. Peasnell et al. (2005) investigate the association between board independence and income-increasing abnormal accruals. They find that the likelihood of managers making earnings-increasing abnormal accruals to avoid reporting losses and earnings reductions is negatively related to the proportion of independent directors on the board. The results suggest that when pre-managed earnings are negative or below last year's reported earnings, abnormal accruals are less positive if the proportion of independent directors on the board is relatively high. Moreover, the findings suggest that boards only seem to intervene in the case of earnings-increasing earnings management, not earnings-decreasing earnings management. Finally, Kent et al. (2010) report a positive association between board independence and accrual quality. Some studies, however, have failed to find a relationship between board independence and earnings management (e.g. Chtourou et al. 2001, Mulgrew and Forker 2006). Chtourou et al. (2001) argue that the insignificant association could be the result of stock-option holdings of independent directors. They find that these stock-option holdings are positively associated with earnings management measured by abnormal accruals. In particular they state: *"This result indicates that this type of compensation for directors does not necessarily improve monitoring, but may create incentives that reduce the quality of their control on financial statement reliability."* (Chtourou et al. 2001:30). Taken together, prior evidence suggests a negative association between board independence and earnings management.

Another characteristic often associated with board independence is the duality of the chairman and the CEO. Regulatory bodies recommend that the roles of the chairman and the CEO should be held by separate individuals (e.g. FRC 2003:6, 2008:7). A separation of these roles prevents a considerable concentration of power in the hands of the CEO. The power to control the board of directors comes from the fact that the chairman is responsible for setting the agenda and running the board meetings and from the importance of the board's role in appointing and monitoring the managers. Dechow et al. (1996) provide evidence that firms whose CEO is also chairman of the board (COB) are more likely to be subject to SEC-enforcement actions for overstated earnings. Park (1999) finds a positive association between CEO-chairman duality and the incidence of litigation against auditors. Goyal and Park (2002) report that the sensitivity of CEO turnover to firm performance is significantly lower when the roles of CEO and chairman are held by the same individual. Moreover, Anderson et al. (2004) report that the separation of CEO and chairman increases the information content of earnings. Others suggest no association. Beasley (1996) and Ebrahim (2007) find no association between CEO-chairman duality and earnings management. Yet others argue that the association is negative since the CEO-chairman duality might be an efficient outcome in some firms (Brickley, Coles and Jarrell 1997). Still, mounting evidence suggests that CEO-chairman duality has a negative impact on the monitoring function of the board, which potentially leads to more earnings management.

The last indicator of board independence discussed here is the CEO-founder duality. Dechow et al. (1996) and Mulgrew and Forker (2006) argue that if the CEO is the founder, the CEO is more likely to have strong influence over board decisions and operations and be less accountable to the board. Dechow et al. (1996) report that firms with CEOs being the founders, more likely will be subject to SEC-enforcement actions for reporting overstated earnings. Similar evidence is reported by Mulgrew and Forker (2006). This suggests a positive association between CEO being the founder and earnings management.

4.4.5.Other board characteristics

Other board characteristics than size, activity and board composition are also investigated, for instance the number of directorships and the managerial stockholdings. Multiple directorships are more common in larger, more successful firms with large boards (Ferris, Jagannathan and Pritchard 2003, Perry and Peyer 2005). A director with multiple directorships will probably sit on boards with other directors with multiple directorships (Ferris et al. 2003). Multiple directorships held by independent directors may have two different impacts on board efficiency. It may reduce the time and effort the director dedicates to each firm, which in turn harms board efficiency (Morck, Schleifer and Vishny 1988, Beasley 1996). In contrast, it may provide independent directors with corporate expertise and valuable networks (Rosenstein and Wyatt 1990, Perry and Peyer 2005). Fama (1980) and Fama and Jensen (1983) argue that the outside directors' incentives to monitor managers are provided by the market for directors. Their market values as directors increase if they can signal to the market that they are decision and monitoring experts. Evidence demonstrates that the market for directors does provide these directors with incentives to monitor the managers. For instance, Gilson (1990) reports that non-executive directors lose outside directorships after leaving the board of financially distressed firms. In a similar vein, non-executive directors of firms charged with accounting and disclosure violations by the SEC are more likely than others to lose their directorships (Gerety and Lehn 1997). This suggests that firms with independent directors holding more directorships have less earnings management. Consistent with this, Chtourou et al. (2001) find that the number of directorships is negatively associated with earnings management. Others, however, find a positive association between number of multiple directorships and financial fraud (e.g. Beasley 1996). Proper monitoring requires time and effort (e.g. Morck et al. 1988). As the number of additional directorships increases, the time available for the director to fulfill monitoring responsibilities at a single firm decreases. Beasley (1996) argues that the documented positive association between multiple directorships and financial fraud is consistent with additional directorships distracting outside directors from their monitoring responsibilities and thereby increasing the likelihood of financial fraud. Because of the inconsistent evidence, the sign of the association between multiple directorships and earnings management remains unclear.

Managerial stockholdings are supposed to be efficient in aligning the interests of the managers with those of the shareholders. Jensen and Meckling (1976), Fama (1980) and Fama and Jensen (1983) propose a positive linear relationship between managerial stockholdings and firm performance. Managers with higher stockholdings are less inclined to divert resources away from value maximisation. Later studies have suggested that the relationship between managerial stockholdings and agency costs is non-linear (Morck et al. 1988, McConnell and Servaes 1990, 1995). It has been shown that low levels of managerial stockholdings align the interests of managers and shareholders by reducing managerial incentives for perks, utilising insufficient effort and engaging in non-maximising projects, generally termed *the alignment effect*. However, after some level of managerial ownership, managers exert insufficient effort, collect private benefits and entrench themselves at the expense of other shareholders, generally termed *the entrenchment effect*. Morck et al. (1988) find a positive association between CEOs' stockholdings and Tobin's Q for low ownership levels between 0% and 5% and for ownership levels above 25% for US-listed firms. This is consistent with an alignment effect. Evidence consistent with the entrenchment effect is found for ownership levels in the range of 5% to 25%. Yermack (1996) demonstrates a positive association between inside and outside directors' stockholdings, suggesting an alignment effect. Short and Keasey (1999) investigate UK-listed firms rather than US-listed firms and find different ownership ranges for alignment and entrenchment effects. A positive association is demonstrated between managerial stockholdings and Tobin's Q for ownership levels in the range of 0% to 40-50%.

Evidence on the association between managerial stockholdings and earnings management is documented in the literature. For instance, Warfield et al. (1995) find a negative association between managerial stockholdings and abnormal accruals, suggesting that higher stockholdings reduce earnings management. Others such as Klein (2002) report a weak positive association between CEOs' stockholdings and earnings management. Still, it is reasonable to expect that managerial stockholdings to some extent have the potential to align the interests of the managers with those of the shareholders. This suggests that higher managerial stockholdings reduce earnings management, at least, earnings management which is opportunistic towards shareholders.

4.4.6.Audit-committee characteristics

The audit committee is believed to be in forefront to maintain the board's role as a monitor of the financial-reporting process (e.g. DeFond and Francis 2005, Ebrahim 2007). Davidson et al. (2005) note that the specialised monitoring role of audit committee *"(...) is likely to provide shareholders with the greatest protection in maintaining the credibility of a firm's financial statement."* The audit committee shall *"(...) review the significant financial reporting issues and judgments made in connection with the preparation of the company's financial statements (...) significant accounting policies, any changes to them and any significant estimates and judgments"* (FRS 2003:51). Four characteristics of audit committees have got particular attention in the literature: audit-committee independence, audit-committee expertise, audit-committee activity and audit-committee size. Since the audit committee is a sub-committee of the board, it is assumed that the performance of the audit committee is closely related to the performance of the board. The audit committee is unlikely to be efficient if rest of the board is dysfunctional. The efficiency of the board and the audit committee are, therefore, complements rather than substitutes as corporate-governance mechanisms (e.g. DeFond and Francis 2005). For instance, Beasley and Salterio (2001) find a close relation between an independent board and the appointment of a higher quality audit committee.

The audit committee should only comprise independent non-executive directors (e.g. FRC 2003, 2008, DeFond and Francis 2005). The requirement that all audit-committee members should be independent follows the conventional notion that independent directors are better monitors of managers than non-independent directors. Several studies have reported a negative association between audit-committee independence, accounting fraud and earnings management. For instance, Chtourou et al. (2001), Klein (2002) and Xie et al. (2003) find a negative association between the proportion of independent directors on the audit committee and earnings management. Moreover, Ebrahim (2007) finds a negative association between an indicator variable for audit independence, all members being independent, and earnings management. Anderson et al. (2004) report a positive association between audit-committee independence and the information content of earnings and finally, Kent et al. (2010) find a positive association between audit independence and accrual quality. Still, DeFond and Francis (2005) question the need for an entirely independent audit committee. They argue that full independence is a *corner solution* and such solutions are rarely correct. They do admit that it is beneficial to have independent directors on the board and also as part of the audit committee, but not necessarily that all members should be independent. As for other research findings discussed in this subchapter (e.g. board size, board composition and board activity) the above findings might be driven by correlated-omitted variables and endogeneity problems. There are at least two plausible explanations of a negative association between audit-committee independence and earnings management: Independent audit-committee members take actions to prevent opportunism and earnings management. Better performing firms with less incentives to manipulate earnings choose more independent audit-committee members because they have less to conceal (Cohen et al. 2004, DeFond and Francis 2005).

The primary role of the audit committee is to monitor the financial-reporting process which certainly demands some accounting expertise. Regulators recommend that audit committees should hold at least one financial expert (e.g. FRC 2003:16, DeFond and Francis 2005:18). For instance, UK Combined Code (FRC 2003:16) states that *"[t]he board should satisfy itself that at least one member of the audit committee has relevant and reliable financial expertise."* Two types of financial experts will meet the above requirement: accounting-financial experts and non-accounting-financial experts (Krishnan and Lee 2009). The former is an individual holding specific accounting expertise, for instance, experience as a chartered accountant, while the latter is a financial expert with more general knowledge and experience in analysing financial statements. Xie et al. (2003) argue that an audit committee without financially qualified members may turn out to be nothing more than ceremonial. They argue that an active, well-functioning and well-established audit committee may be able to prevent earnings management. Independent and qualified audit-committee members are the most important ingredients. They find evidence consistent with these predictions. Similar evidence is reported by Chtourou et al. (2001). McMullan and Raghunanadan (1996) demonstrate a negative association between audit-committee expertise and firms subject to SEC-enforcement actions. Some studies employ a narrow definition of audit-committee expertise comprising only *financial-accounting experts*. Bedard, Chtourou and Courteau (2004) find a negative association between financial-accounting expertise and earnings management, and Dhaliwal, Naiker and Navissi (2006) find a positive association between financial-accounting expertise and accrual quality. And finally, Krishnan and Visvanathan (2007) find evidence of a positive association between this measure of expertise and conservatism. DeZoort (1998) evaluate whether audit-committee members with experience in auditing and internal control make different internal-control evaluations than members without this experience. Consistent with predictions, they find that members with experience are more likely than members without experience to make control evaluations more in line with external auditors. The audit-committee members with greater experience are more consistent and demonstrate a higher degree of consensus. These results suggest that audit committees with members holding auditing and internal-control experience at least have a better understanding of the auditor's side of disputes with managers and may lend support to the auditor in such disputes. Taken together, it is reasonable to predict a negative association between financial-accounting expertise and earnings management.

Two final characteristics are audit-committee activity measured as number of meetings and audit-committee size measured as number of members. As for the full board, higher frequency of meetings is believed to be indicative of the monitoring effort. The regulatory bodies generally recommend at least three audit-committee meetings each year (e.g. FRC 2002:48, DeFond and Francis 2005:22). Chtourou et al. (2001:29) and Xie et al. (2003:309) find a negative association between audit-committee meetings and earnings management. Ebrahim (2007:52) finds evidence suggesting that firms with high audit-committee activity have less earnings management. McMullan and Raghunandan (1996) and Abbott et al. (2000) find that the likelihood of financial fraud and earnings restatements is lower if the firm has frequent audit-committee meetings. And finally, a positive association is found between audit-committee activity and the information content of earnings (e.g. Anderson et al. 2004). This suggests that the audit-committee activity measured as number of meetings is negatively associated with earnings management.

Some scarce evidence is also found for the association between audit-committee size measured as number of committee members and earnings management. A larger audit committee is believed to provide more resources and expertise, which in turn will improve the monitoring of the financial-reporting process (e.g. Karamanou and Vafeas 2005). The evidence on this matter is, however, limited and to some extent inconsistent. Bedard et al. (2004) find no evidence that audit-committee size reduces earnings management. Xie et al. (2003) find a negative, but insignificant association between audit-committee size and earnings management, and Kent et al. (2010) report a positive association between committee size and accrual quality. In contrast, Anderson et al. (2004) report a negative association between audit-committee size and the information content of earnings. Still, it is believed that larger audit committees will have more expertise and more monitoring power. This suggests that larger audit committees should be associated with less earnings management.

4.4.7. Other monitoring mechanisms

The board of directors is not the only monitoring device of a firm. Potential candidates are external auditor (Becker, DeFond, Jiambalvo and Subramanyam 1998, Francis, Maydew and Sparks 1999, Ebrahim 2007), outside blockholders, regulatory bodies, the stock exchange (Stulz 1999, Lang, Lins and Miller 2003, Leuz, Nanda and Wysocki 2003, Burgstahler, Hail and Leuz 2006) and finally, the press (Feroz, Park and Pastena 1991, Beneish 1997, Dyck, Morse and Zingales 2008). Outside blockholders and cross-listing are considered here. Blockholders are believed to be important monitors of managers (e.g. Smith 1976, Jensen and Meckling 1976, Shleifer and Vishney 1986). They have greater motivation and ability to monitor managers than small shareholders (Smith 1976, Fama 1980, Shleifer and Vishney 1986, 1997, Dechow et al. 1996, Zhong et al. 2007).

Monitoring is more cost-efficient for blockholders. Shareholders that monitor the managers will obtain the benefits from monitoring only for the proportion of shares they own. Still, they have to bear all the costs of monitoring. A larger stockholding provides a larger share of benefits from monitoring and thus, a higher probability of covering the costs of monitoring. Besides, small shareholders can sell their shares quickly if they are not satisfied with the managers' performance. The situation is different for large blockholders. Selling a large stockholding will probably decrease the stock price. Consequently, blockholders must adopt a long-term investment strategy. Dechow et al. (1996) find evidence that the existence of outside blockholders is negatively associated with financial fraud. Similar evidence is reported by Demsey, Hunt and Schroeder (1993) and Cheng and Reitenga (2009). Zhong et al. (2007), however, argue that blockholders will try to prevent earnings management outside GAAP, but not necessarily earnings management within GAAP. The benefits of allowing earnings management within GAAP are expected to be higher than the costs of preventing it, suggesting that blockholders will make no attempt to prevent such within-GAAP earnings management. They find evidence consistent with these predictions. Taken together, it is reasonable to predict that blockholders will monitor the managers and make an effort to prevent earnings management.

Cross-listing on stock exchanges with strict disclosure regulations and enforcement such as the New York Stock Exchange (NYSE) and the NASDAQ Stock Exchange are supposed to reduce the extent of earnings management. Lang, Raedy and Yetman (2003) find that firms cross-listed in the US are less aggressive in terms of earnings management, report accounting numbers that are more conservative, take account of bad news in a timely manner and report more value relevant accounting numbers. Leuz, Nanda and Wysocki (2003) examine earnings management across 31 countries and find that earnings reported in non-US firms show more evidence of earnings management than US firms. Burgstahler et al. (2006) report that earnings management is more pervasive in countries with weak legal enforcement. And finally, Bailey, Karolyi and Salva (2006) find larger market responses to earnings announcements of firms cross-listed on US-stock exchanges. This suggests that firms cross-listed on the New York Stock Exchange or the NASDAQ Stock Exchange on average have less earnings management.

4.5. Accounting for goodwill – evidence of earnings management

This part of the chapter discusses evidence of earnings management in reported goodwill-impairment losses. Included are also studies that report evidence of earnings management in impairment losses and write-downs other than in goodwill. Studies investigating earnings management in relation to the purchase or pooling choice (e.g. Aboody, Kasznik and Williams 2000, Weber 2004), purchase-price allocation (e.g. Grinyer, Russel and Walker 1991, Dunstan 1999, Wong and Wong 2001) and length of the amortisation period of goodwill (e.g. Hall 1993, Henning and Shaw 2003) are considered outside the scope of this dissertation.

4.5.1.Earnings management and impairment losses

Earnings management and impairment losses are carefully investigated in the literature. Strong and Meyers (1987) are among the first researchers to investigate impairment losses, restructuring charges and earnings management. At that time there was scarce regulation on impairment losses which gave managers lots of discretionary freedom to identify, estimate and report impairment losses. Strong and Meyer (1987) compare 120 firms reporting impairment losses in the period 1981-1985 with a matched sample of firms not reporting impairment losses.

Variables important for impairment decisions are examined such as economic variables like stock returns and market-to-book ratios, and variables reflecting earnings-management incentives such as management change and debt-to-equity ratios. The single most important explanatory variable of impairment losses is change in management: *"The managerial effect is most pronounced when the new executive comes from outside the company. This relation is consistent with the hypothesis that managerial change induces restructurings, and that write-downs are more likely to occur when incoming management was not associated with prior investments and asset management decisions"* (Strong and Meyer 1987:651). Zucca and Campbell (1992) investigate impairment losses like Strong and Meyer (1987) in a setting with scarce regulation. 77 impairment losses reported by 67 US firms in the period 1978-1983 are examined. The big-bath and income-smoothing hypotheses are in particular focus. They classify all the write-down firms as either *bathers* or *smoothers*. To determine whether the write-down is triggered by earnings management, a measure of expected earnings is estimated and compared with the reported earnings for each firm in the period in which the impairment is reported. *Smoothers* are firms with earnings in the pre-impairment period that are higher than expected, while *bathers* are firms with earnings that are lower than expected. 29% of the impairment firms are classified as *smoothers* whereas 58% are classified as *bathers*. This result gives some support to the claim that impairment losses are reported to manage earnings.

The study by Francis et al. (1996) represents an important extension to the previous studies of Strong and Meyer (1987) and Zucca and Campbell (1992). Francis et al. (1996) investigate whether impairment losses are explained by variables reflecting economic impairment or earnings-management incentives. They also separate impairment losses into different categories of assets:

Impairment losses in goodwill, in property, plant and equipment, in inventory, in other assets and unspecified impairment losses. In addition, they include restructuring charges. 674 impairment losses in US firms reported in the period 1989-1992 are investigated. To control for economic variables explaining the impairment, they include measures for past firm performance and past industry performance as explanatory variables. They also include variables for earnings-management incentives such as an indicator variable for change in management and variables reflecting *bathing* and *smoothing* incentives. The results reveal that impairment losses increase with change in management, the firm's and the industry's history in reporting impairment losses and firm size. In contrast, impairment losses decrease in firm and industry performance. The investigation is also carried out for separate categories of assets believed to offer different degrees of reporting discretion. The results suggest that none of the variables are associated with reported impairment losses in inventory. In contrast, all the variables are significantly associated with impairment losses in goodwill. For instance, change in management is not associated with impairment losses in inventory, only marginally associated with impairment losses in property, plant and equipment, but strongly associated with goodwill-impairment losses and restructuring charges. Taken together, the results suggest *"(...) that incentives have no influence on inventory write-offs, have marginal significance in explaining property, plant, and equipment (...), and play a substantial role in explaining goodwill write-offs and restructuring charges"* (Francis et al. 1996:134). Wilson (1996) criticises the research design employed in this study. He argues that most of the proxies for manipulation such as change in management could be proxies for economic impairment. For instance, the significant association between goodwill impairment and management change could be driven by poor firm performance, which leads to change in management and recognition of impairment losses. It is reasonable to believe, however, that economic variables to some extent will control for economic impairment. This suggests that any association between change in management and reported impairment after controlling for these economic variables will reflect earnings-management incentives rather than economic impairment.

Inspired by Francis et al. (1996) several studies have investigated the extent to which impairment losses are explained by economic variables for impairment or earnings-management incentives (e.g. Loh and Tan 2002, Sellhorn 2003, Riedl 2004, Kvaal 2005, Zang 2008, Lapointe-Antunes et al. 2008). Loh and Tan (2002) investigate impairment losses in property, plant and equipment, and investments reported in listed firms in Singapore. They include firm profitability, change in management and debt-covenant incentives measured as debt-to-equity ratios as explanatory variables. As an extension to Francis et al. (1996), they include macro-economic variables such as Gross Domestic Product, growth rate, property occupancy rate, interest rate and unemployment rate as explanatory variables of impairment losses. Their sample comprises 94 firms reporting impairment losses in the period 1983-1997. A pooled and cross-sectional logit and tobit regression is run along with a time-serial ordinary-least-square regression. Macro-economic variables are found to be important explanatory variables of impairment losses in investments, but of less importance when explaining impairment losses in property, plant and equipment. Not surprisingly, the occupancy rate is a significant explanatory variable for impairment losses in property, plant and equipment. Moreover, change in management is found to be positively associated with impairment losses in property, plant and equipment, but not impairment losses in investments. As investments are generally traded in capital markets, accounting for these investments offer less discretionary freedom. This may explain that economic variables are more strongly associated with impairment losses in investments than in property, plant and equipment.

Riedl (2004) investigates the extent to which the associations between impairment losses, variables for economic impairment and earnings-management incentives have changed upon the adoption of a new impairment standard, SFAS 121, under US-GAAP. 2754 impairment losses reported by 1035 firms during the period 1992-1998 are examined. As in Francis et al. (1996), economic variables are intended to capture the underlying economic impairment. He includes economic variables at three levels: macro-economic level, industry level and firm level. Interestingly, prior year's stock return is not included among these variables. He argues that an inclusion of stock return as an explanatory variable seems logically inconsistent, as reported impairment losses are considered as input into the market valuation of the firm, not as an effect of the market valuation. This rests on the assumption that accounting numbers are used as input in the estimation of the firm's intrinsic value. This assumption, however, is arguable. Market values are often used as estimates of fair values when preparing the financial statement. This suggests that market values and stock returns could themselves influence accounting numbers, not only be influenced by accounting numbers (e.g. Machintosh, Shearer, Thompton and Welker 2000). In line with Strong and Meyer (1987) and Francis et al. (1996), Riedl (2004) includes change in management as a potential variable explaining the reported impairment. He also makes use of proxies for *bathing* and *smoothing* consistent with Francis et al. (1996). No proxies for contracting incentives are included except an indicator variable for private debt. The results reveal that economic variables are more closely associated with impairment losses in the pre-SFAS 121 period than in the post-SFAS 121 period. This suggests that impairment losses under SFAS 121 do not reflect economic impairment to the same extent as impairment losses under pre-SFAS 121. Moreover, change in management, the proxy for big-bath incentives and the debt-covenant proxy are significantly associated with impairment losses under SFAS 121. Taken together, these findings suggest that the quality of impairment losses has declined upon the adoption of SFAS 121.

Like Francis et al. (1996), Kvaal (2005) investigates whether impairment losses for different categories of assets reflect economic impairment or earnings-management incentives. A sample of 238 UK firms reporting 84 impairment losses in 2002 is examined. Both the impairment decision and the reported impairment amount are investigated. The economic variables are stock return, firm size [13], accounting return and price-to-book ratios. Earnings-management incentives are captured by debt-to-equity ratios and change in management. Another variable, the depreciation rate, expected to reflect the degree of conservatism, is also included. The decision to report an impairment loss is examined for each asset category. Impairment losses in tangible assets are heavily influenced by the depreciation rate, whereas debt-to-equity and price-to-book ratios explain impairment losses in non-goodwill intangible assets. For goodwill, accounting return and depreciation rate are important explanatory variables of impairment losses. An investigation of the size of impairment losses reveals somewhat different results. Industry dummies for telecom and IT-industry are the only variables significantly associated with impairment losses in tangible assets. For goodwill, several variables are significant, and among these: change in management.

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[13] Firm size might be associated with biased or unbiased accounting of impairment losses (Kvaal 2005: 35-7).

Beatty and Weber (2006) investigate the implementation of SFAS 142 and the decision to report the transitional impairment loss in goodwill as an operating loss or as an effect of change in accounting principles. Earnings-based compensation incentives, debt-covenant incentives and stock-exchange requirements are included as explanatory variables. Two different regressions are run: A probit regression estimating the likelihood that the goodwill impairment is reported above-the-line as an operating loss, given variables for economic impairment and earnings-management incentives, and a tobit regression estimating the association between goodwill-impairment losses, variables for economic impairment and earnings-management incentives. The probit regression indicates that firms are less likely to report impairment losses above-the-line if they have little debt-covenant slack and the slack is affected by accounting numbers. The likelihood of impairment losses is smaller for firms that have earnings-based compensation plans, not excluding the effects of special items such as change in accounting principles. Moreover, firms with managers with relatively longer tenures are less likely to report impairment losses. Beatty and Weber (2006) also demonstrate that firms listed on a stock exchange with accounting-based listing requirements are less likely to report impairment losses. In sum, the results suggest that earnings-management incentives are important to explain goodwill-impairment losses.

Bens (2006) criticises some of the earnings-management proxies employed by Beatty and Weber (2006). He argues that the proxies may suffer from measurement errors and self-selection bias. For instance, the tenure variable may proxy for the life of the firm. He argues with reference to Fama and French (2001) that firms which went public in the 1990s tended to be younger and less profitable than previous generations of initial-public offerings. As these firms were more aggressive in the take-over market, they will probably have more book goodwill and managers with shorter tenures. This suggests that some of the results in Beatty and Weber (2006) should be interpreted with caution.

Like Beatty and Weber (2006), Zang (2008) investigates transitional impairment losses in goodwill. He investigates 870 US-firms reporting 255 transitional impairment losses in 2001-2003. A tobit regression is employed to test whether impairment losses are associated with variables for economic impairment or earnings-management incentives, represented by change in management and debt-to-equity. A negative association is reported between impairment losses and debt-to-equity, and a positive association is reported between impairment losses and change in management. These results are consistent with findings in previous literature (Strong and Meyer 1987, Francis et al. 1996, Riedl 2004, Kvaal 2005). In a similar vein, Lapointe-Antunes et al. (2008) investigate incentives to report transitional impairment losses in 331 Canadian listed firms. Although this study has several similarities with previous research, it also provides extensions. Along with conventional measures such as change in management and measures for debt-covenant incentives, the study includes equity-based incentives driven by stock-option holdings and debt and equity issuances. In addition, the study includes constraining factors of earnings management such as audit-committee characteristics, blockholdings and cross-listing. The results from the tobit regression on variables for economic variables, earnings-management incentives and corporate-governance mechanisms show a negative association between transitional impairment losses and leverage, stock-option holdings, subsequent issuance of new debt or equity capital, cross-listing and blockholdings. No association, however, is found between the proportions of independent audit-committee members and transitional impairment losses. Following Zang (2008), the impairment amount is separated into an unexpected and an expected portion where the expected portion is the predicted values from a regression of impairment losses on economic variables. The proportion of independent audit-committee members is found to be negatively associated with unexpected impairment losses.

The above studies are concerned with impairment losses as reported in the financial statement. Discretionary impairment accounting, however, involves decisions to avoid and delay impairment losses just as decisions to overstate and accelerate impairment losses. Ramanna and Watts (2009) investigate a sample of firm-year observations where no goodwill-impairment losses are reported despite the fact that impairment losses likely are present. They are particularly concerned with the reluctance to report impairment losses and the extent to which this reluctance is explained by managers' opportunism or managers' private information about the firm's future prospects. They construct a sample of firm years with book-to-market ratios greater than one for two subsequent years. The final sample consists of 124 firm-year observations over the period 2003-2006. They identify firms likely to have favourable private information as those firms with either positive net share-repurchase activity or positive net-insider buying. The non-impairment frequency among firms with favourable private information is undistinguishable from non-impairment frequency among all other firms. To investigate whether non-impairment is associated with earnings-management incentives, they test cross-sectional variation in goodwill-impairment losses with variables for earnings-based compensation, management reputation, equity-based incentives, exchange-delisting incentives and debt-covenant incentives. The regression reveals that the size of the reported impairment losses decreases with an increase in the number and size of cash-generating units (business segments) and the relative amount of discretionary net assets in cash-generating units. The debt-covenant measure and managers' tenure are negatively associated with size of impairment losses. As summed up by Ramanna and Watts (2009:35): *"The results in this article are consistent with managers exploiting unverifiable fair-value-based discretion in SFAS 142 to avoid timely goodwill write-offs in circumstances where they have agency-based motives to do so (…). The results do not confirm standard setters' arguments that unverifiable fair-value-based discretion in SFAS 142 is used to convey private information on future cash flows."*

The evidence discussed in this subchapter suggests that impairment losses are explained to some extent by variables for economic impairment and earnings-management incentives (e.g. Strong and Meyer 1987, Elliot and Shaw 1988, Francis et al. 1996, Riedl 2004, Kvaal 2005, Lapointe-Antunes et al. 2008, Zang 2008, Ramanna and Watts 2009). Earnings-management incentives are particularly important when explaining impairment losses in goodwill (e.g. Francis et al. 1996, Kvaal 2005). Some evidence also suggests that earnings management remains a challenge even after the adoption of the impairment-only method in US-GAAP and Australian GAAP (Lapointe-Antunes et al. 2008, Zang 2008, Ramanna and Watts 2009).

5. Hypotheses

This chapter presents the hypotheses in this dissertation. They are presented in subchapters for each research question.

5.1. Value relevance of goodwill under the impairment-only method

Prior literature has demonstrated that book goodwill is value relevant. These findings are consistent across a number of studies using different methodological designs and samples of observations (Amir et al. 1993, Wang 1993, Chauvin and Hirschey 1994, Jennings et al. 1996a, Huijgen 1996, Barth and Clinch 1996, Wilkins et al. 1998, Henning et al. 2000, Petersen 2001, 2002, Bugeja and Gallery 2006). The evidence from these studies suggests that goodwill is perceived as an economic asset by the capital market and should be capitalised on the balance sheet. Book goodwill is, therefore, predicted to be value relevant under current IFRS. The new impairment-only method departs from prior accounting methods for goodwill in two respects: Goodwill should be tested for impairment losses at least annually, and systematic amortisation of goodwill is prohibited. Both FASB and IASB assert that annual impairment testing and no amortisation will provide more decision useful accounting numbers of goodwill. Several studies have examined the value relevance of reported goodwill-impairment losses. Some studies find evidence consistent with the notion that the new impairment-only method provides more decision-useful information. Bens and Heltzer (2005) find that goodwill-impairment losses are value relevant. Several studies have also demonstrated that these impairment losses have information content (Hirschey and Richardson 2002, Li, et al. 2005, Bens and Heltzer 2005, Li and Meeks 2006). There is also some evidence inconsistent with the above results.

Chen et al. (2004) investigate the value relevance of earnings with and without deduction from goodwill-impairment losses and report insignificant differences in explanatory power between these earnings measures. However, when employing a conventional price-book-earnings regression, they find some evidence consistent with these impairment losses being value relevant. Goodwill-impairment losses are, therefore, predicted to be value relevant under current IFRS. The hypotheses in table 5.1 are in two versions: One version with *stock price* as benchmark, and another version with *stock return* as benchmark of value relevance. The first set of hypotheses make predictions about the extent to which book goodwill represents economic goodwill and goodwill-impairment losses represent economic impairment reflected in stock prices. The second set of hypotheses make predictions about the extent to which goodwill-impairment losses represent timely information about economic impairment reflected in stock returns.

Table 5.1 Hypotheses on value relevance of goodwill under the impairment-only method

<table>
<tr><th>Stock price as value-relevance benchmark</th><th>Stock return as value-relevance benchmark</th></tr>
<tr><td>H1a: Book goodwill under the impairment-only method (current IFRS) is positively associated with stock prices.</td><td rowspan="2">H1c: Reported goodwill-impairment losses under the impairment-only method (current IFRS) are negatively associated with stock returns.</td></tr>
<tr><td>H1b: Reported goodwill-impairment losses under the impairment-only method (current IFRS) are negatively associated with stock prices.</td></tr>
</table>

5.2. Value relevance of goodwill under alternative accounting methods

Mixed results are found for value relevance of goodwill-amortisation charges. Some studies report that goodwill amortisation lacks value relevance and even impair the decision usefulness of earnings. Huigjen (1996) finds no significantly negative association between goodwill amortisation and stock prices, whereas Vincent (1997) reports an unexpected positive association between these charges and stock prices. In line with Huigjen (1996), Jennings et al. (2001) and Moehrle et al. (2001) find no value relevance in goodwill-amortisation charges and even conclude that these charges impair the decision usefulness of earnings. Other studies, however, such as those by Jennings et al. (1996a) and Petersen (2001, 2002) suggest that goodwill amortisation might provide at least some value relevance. And finally, Wang (1993) and Bugeja and Gallery (2006) find evidence suggesting that goodwill should be amortised over short time periods.

Most of these findings are inconsistent with the a priori predictions. Goodwill amortisation should reflect reductions in the cash-generating capacity of goodwill and thereby the net present value of goodwill. Reductions in net present values are by definition economic charges and should be significantly negatively associated with stock prices and stock returns, respectively. The insignificantly negative association and sometimes insignificantly or significantly positive association between amortisation charges and stock prices could be the result of econometrical problems. Likely candidates are heteroscedastic disturbance and correlated-omitted variables. Correlated-omitted variables and scale effects may turn an otherwise significantly negative coefficient on goodwill-amortisation insignificantly negative, insignificantly positive or even significantly positive. The positive association could simply be driven by large firms with more book goodwill and more goodwill-amortisation charges, that is, an uncorrected scale effect. Potential econometrical problems should, therefore, be given careful concern in the empirical analysis.

Prior value-relevance research has generally investigated goodwill-impairment losses and goodwill-amortisation charges in isolation. These studies only provide limited guidance for evaluating the impairment-only method relative to alternative accounting methods for goodwill. Following Chambers (2007), a more powerful research design would be to compare the value relevance of goodwill numbers under current IFRS (the impairment-only method) with the value relevance of goodwill numbers under alternative accounting methods. This is possible if as-reported goodwill numbers under the impairment-only method are compared with as-if adjusted goodwill numbers under alternative methods. Specifically, a comparison will be made between accounting numbers reported by an accounting system using impairment testing only (current IFRS-regulation), systematic amortisation with no impairment testing and a combination of systematic amortisation and impairment testing. This leads to the following hypotheses:

Table 5.2 Hypotheses on value relevance of goodwill under alternative accounting methods

Stock price as value-relevance benchmark	*Stock return as value-relevance benchmark*
H2a: Goodwill-amortisation charges (as-if accounted) are not associated with stock prices when goodwill is accounted for under the amortisation-only method.	H2b: Goodwill-amortisation charges (as-if accounted) are not associated with stock returns when goodwill is accounted for under the amortisation-only method.
H2c: Goodwill-amortisation charges (as-if accounted) are not associated with stock prices when goodwill is accounted for under the amortisation-and-impairment method.	H2d: Goodwill-amortisation charges (as-if accounted) are not associated with stock returns when goodwill is accounted for under the amortisation-and-impairment method.
H2e: Goodwill-accounting numbers under the impairment-only method explain variation in stock prices to a larger extent than accounting numbers under the amortisation-only method or the amortisation-and-impairment method.	H2f: Goodwill-accounting numbers under the impairment-only method explain variation in stock returns to a larger extent than accounting numbers under the amortisation-only method or the amortisation-and-impairment method.

5.3. Earnings management and goodwill-impairment losses

The degree of faithful reporting is believed to be partly determined by earnings-management incentives and corporate-governance mechanisms. At least three sets of variables are predicted to be associated with impairment losses: economic variables reflecting economic impairment, variables for earnings-management incentives and variables for corporate-governance mechanisms.

5.3.1.Economic variables

Market-value reductions or current-value reductions are direct measures of economic impairment. Goodwill has no separate market value and it is impossible to separately estimate the current value of goodwill. In a research setting economic impairment in goodwill might be estimated by variables that are supposed to be highly positively associated with the economic impairment. These economic variables make it possible to discriminate faithfully reported impairment losses from impairment losses potentially driven by earnings-management incentives. No inferences can be made upon the question of earnings management in goodwill-impairment losses without a proper control for economic variables that might explain these losses.

Economic variables are included from three levels of aggregation: macro-economic level, industry-sector level and firm level. An economic recession, a reduction in industry performance or impaired firm performance is predicted to increase the likelihood of impairment losses. A substantial reduction in Gross Domestic Product or a major increase in unemployment rate is indicative of economic recession. A recession will probably have a negative impact on the economic performance of most firms. Impaired industry growth and industry performance will affect the economic performance of firms within that industry and increase the likelihood of impairment losses (Francis et al. 1996, Riedl 2002, Segal 2003). Measures such as industry return-on-assets and industry-stock returns are employed. And finally, poor firm performance is indicative of impaired firm-asset values. At the firm level measures such as stock returns, changes in total sales, changes in pre-impairment return-on-assets, operating cash flows and pre-impairment book-to-market ratios are employed (e.g. Francis et al. 1996, Segal 2003, Sellhorn 2004, Riedl 2004, Kvaal 2005). As the true economic impairment is unobservable, it is important to include a broad set of economic variables that reflect economic fundamentals. For that reason, market-based, accounting-based and cash-based measures are included. The likelihood of impairment losses is found to increase in the sequence of previous years' impairment losses. There are at least two explanations for this. If the firm experiences financial distress for several years, successive impairment losses are likely. As time goes by, new impairment losses are recognised and recorded. An alternative explanation is that impairment losses are systematically understated. Francis et al. (1996) and Riedl (2004) find evidence that previous years' economic performance could explain impairment losses in goodwill. This suggests a positive association between last year's impairment losses and current year's impairment losses. In contrast to the economic variables discussed previously, this variable could reflect economic fundamentals and/or earnings-management incentives. Most of the economic variables, except from changes in unemployment rates, book-to-market ratios and previous year's impairment losses, are supposed to be negatively associated with the decision to report impairment losses and the size of impairment losses (takes positive values). The hypotheses in table 5.3 are in two versions: One version for impairment decisions and another version for size of impairment losses. As no causality can be ascertained, the hypotheses are expressed as associations.

Table 5.3 Hypotheses on economic variables

Impairment decision	*Size of impairment losses*
H3a: Changes in Gross Domestic Product are negatively associated with impairment decisions.	H3b: Changes in Gross Domestic Product are negatively associated with size of impairment losses.
H3c: Changes in unemployment rates are positively associated with impairment decisions.	H3d: Changes in unemployment rates are positively associated with size of impairment losses.
H3e: Changes in industry-sector return-on-assets are negatively associated with impairment decision.	H3f: Changes in industry-sector return-on-assets are negatively associated with size of impairment losses.
H3g: Changes in industry-sector stock returns are negatively associated with impairment decisions.	H3h: Changes in industry-sector stock returns are negatively associated with size of impairment losses.
H3i: Stock returns are negatively associated with impairment decisions.	H3j: Stock returns are negatively associated with size of impairment losses.
H3k: Changes in total sales are negatively associated with impairment decisions.	H3l: Changes in total sales are negatively associated with size of impairment losses.
H3m: Changes in pre-impairment return-on-assets are negatively associated with impairment decisions.	H3n: Changes in pre-impairment return-on-assets are negatively associated with size of impairment losses.
H3o: Changes in operating cash flows are negatively associated with impairment decisions.	H3p: Changes in operating cash flows are negatively associated with size of impairment losses.

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H3q: Pre-impairment book-to-market ratios are positively associated with impairment decisions.	H3r: Pre-impairment book-to-market ratios are positively associated with size of impairment losses.
H3s: Last year's impairment losses in goodwill are positively associated with current year's impairment decisions.	H3t: Last year's impairment losses in goodwill are positively associated with current year's size of impairment losses.

5.3.2.Earnings-management incentives

Goodwill-impairment losses might be understated, overstated or unbiased depictions of economic impairment in goodwill. If the reporting strategy is to shift earnings from future periods to the current period, impairment losses are understated and/or delayed. In contrast, if the reporting strategy is to shift earnings from present to future periods, impairment losses are overstated and/or accelerated. It is expected that managers have less incentives to overstate and/or accelerate impairment losses than understate and/or delay impairment losses (Kothari et al. 2010). This does not imply, however, that earnings management only concerns understated and/or delayed impairment losses. Big-bath and management changes might proxy for incentives that lead to overstated and/or accelerated impairment losses.

Earnings management is likely when there are significant information asymmetry, conflicts of interest and discretionary reporting freedom (e.g Field et al. 2001). Under such conditions, accounting becomes a potential instrument used to mislead outside stakeholders. Contracting is one remedy that is supposed to align the interests of the managers with those of the outside stakeholder, e.g. shareholders. If the contracts are inefficient due to high information and contracting costs, a paradoxical result occurs. The contracts may not reduce opportunism and agency costs as intended. Rather, they provide incentives to act opportunistically (e.g. Watts and Zimmerman 1978, 1986, 1990, Healy and Wahlen 1999, Dechow and Skinner 2000, Field et al. 2001). If these inefficient contracts are written in terms of accounting numbers, e.g. net earnings, there is a risk that these numbers will be manipulated to affect the outcomes of these contracts. Conventional examples are earnings-based compensation contracts and debt-covenant contracts (e.g. Watts and Zimmerman 1978, 1986, 1990). Other contracts not written in accounting numbers, such as most equity-based compensation contracts, may also be affected by earnings management. If the capital market is less than semi-strongly efficient, the market participants are on average unable to detect the earnings management and to undo its effects on accounting numbers. Thus, accounting numbers might mislead the capital market, which in turn affects the outcomes of equity-based compensation contracts (e.g. Field et al. 2001). Non-contracting incentives may also lead to earnings management. Such incentives could be managers' career concerns (Fama and Jensen 1983).

Given inefficient contracting, earnings-based compensation contracts may lead to incentives for earnings management. Healy (1985), Gaver et al. (1995) and Holthausen et al. (1995) find evidence that managers manipulate earnings towards upper and lower thresholds for cash-bonus payments. Most research on bonus plans is based on a simplified assumption that there exists a linear relationship between earnings and cash-bonus payments. Beatty and Weber (2006), Lapointe-Antunes et al. (2008) and Ramanna and Watts (2009) employ this assumption, although not explicitly stated, when investigating the association between cash-bonus payments and impairment losses in goodwill. The results, however, are mixed. Lapointe-Antunes et al. (2008) and Ramanna and Watts (2009) document an insignificant association, whereas Beatty and Weber (2006) find a significantly negative association between cash-bonus payments and goodwill-impairment losses. Given prior evidence, it is reasonable to predict that earnings-based compensation plans provide managers with incentives to understate and/or delay goodwill-impairment losses, which suggests a negative association between cash-bonus payments and reported goodwill-impairment losses.

The literature has demonstrated that cash-bonus incentives explain earnings management at a discount relative to equity-based incentives (Schipper and Vincent 2003, Graham et al. 2005, Yaari and Ronen 2008). Equity-based incentives might be triggered by equity-based compensation contracts such as executive stock-options and conditional stocks. The awards of stock options and conditional stocks are generally determined by market-based performance measures such as stock return. Besides, the value of executive stock options and conditional stocks will increase if stock prices increase. Market participants use accounting information such as earnings to form expectations about the firms' future prospects. Given less than a semi-strongly efficient market, reported earnings have the potential to mislead market participants when they make deliberations about selling, buying or holding stocks. Prior evidence in the literature supports a positive association between stock-based compensation and earnings management. For instance, Gao and Shrieves (2002) find a positive association between executive stock options and abnormal accruals. Moreover, Denis et al. (2006), Erickson et al. (2006) and Johnson et al. (2008) show that the likelihood of being accused of fraud increases in the percentage of total compensation being stock-based. Equity-based incentives have received little attention in the asset-impairment literature. Two exceptions are referred to in the literature review. Lapointe-Antunes et al. (2008) investigate the association between executive stock options and goodwill-impairment losses. They find a weakly significantly negative association between stock options and impairment losses. Ramanna and Watts (2009) include the earnings-response coefficient to investigate equity-pricing concerns. They argue that non-impairment decisions are more likely for firms having higher earnings-response coefficients. They find no significant association between these coefficients and impairment decisions. The likelihood of stock awards and stock-option awards and the value of these awards will increase when stock prices increase. It is, therefore, predicted that managers holding more executive stock options and conditional stocks are more inclined to understate and/or delay impairment losses. Negative associations are predicted between executive stock options holdings, conditional stockholdings and reported goodwill-impairment losses.

There are at least three reporting strategies that are associated with accounting for goodwill impairment: target accounting, income smoothing and big-bath accounting. If pre-impairment earnings are above the earnings target, the managers may report impairment losses to obtain an earnings number closer to the target. Similarly, if pre-impairment earnings are unexpectedly high or low, this may provide incentives to either engage in income smoothing or big-bath accounting (Zucca and Campbell 1992, Francis et al. 1996, Rees et al. 1996, Massoud and Raiborn 2003, Riedl 2004, Van de Poel, Maijoor and Vanstrealen 2009). Zucca and Campbell (1992) argue that big-bath impairment losses are reported in periods in which pre-impairment earnings are already below expected earnings. Managers may undertake a big bath in such periods to improve future earnings and provide a signal that bad times are behind them and better times will follow (Zucca and Campbell 1992, Alciatore et al. 1998). Income smoothing may occur in periods where pre-impairment earnings are higher than expected. By reporting impairment losses, earnings will be closer to the level expected. Finally, Kirshenheiter and Melumad (2002) present a model in which both big bath and income smoothing can be seen as part of an equilibrium reporting strategy. A larger earnings surprise reduces the inferred precision of the earnings number and thereby reduces the effect on firm value. This creates a natural incentive for managers to *take a bath* as a greater negative surprise has a reduced overall effect on the firm value. Moreover, it also provides a rationale for managers to smooth earnings as the reduction in positive earnings surprises similarly leads to greater inferred precision of the reported earnings. In both cases, the reporting behaviour maximises the value of the firm. Target accounting, income smoothing and big-bath accounting can all be explained by incentives triggered by earnings-based and equity-based compensation. Still, they are not the only candidates explaining these reporting strategies. Another candidate is reputation concerns. This suggests that additional variables for target accounting, income smoothing and big-bath accounting should be included to capture other incentives than those represented by earnings-based and equity-based compensation contracts.

The literature has demonstrated that change in management is positively associated with impairment losses (e.g. Strong and Meyer 1987, Francis et al. 1996, Riedl 2004, Kvaal 2005, Zang 2008). The evidence suggests that the incoming manager has an incentive to *take a bath* in the year of the change as low earnings may be blamed on the preceding manager. Moreover, the big bath will reduce earnings and net-asset values, which in turn will increase the likelihood of reporting higher earnings and improved firm performance in the future. An alternative argument suggests that the positive association between impairment losses and changes in management reflects economic fundamentals rather than managerial opportunism. New management may exercise greater scrutiny over existing assets or change the firm's strategic position, resulting in an impairment loss (Wilson 1996, Francis et al. 1996, Riedl 2004). A final argument suggests that the preceding manager is removed due to poor firm performance. Given proper control for economic impairment, a significant association between management change and impairment losses may capture the new manager's incentives to take all potential charges and attribute them to the preceding manager. Prior research generally investigates the change of CEO only (e.g. Strong and Meyer 1987, Elliot and Shaw 1988, Francis et al. 1996, Cotter et al. 1998, Riedl 2004, Beatty and Weber 1996, Lapointe-Antunes et al. 2008, Zang 2008). This dissertation, however, investigates changes in the three top management positions: Chairman of the Board (COB), Chief Executive Officer (CEO) and Chief Financial Officer (CFO). For all three there are predicted positive associations between management change and goodwill-impairment losses.

The contracting literature considers debt contracts as a potential source of earnings-management incentives. As for earnings-based and equity-based compensation contracts, debt contracts will only trigger earnings management if they are inefficient in aligning the interests of managers and shareholders on the one hand with those of the debtholders on the other. Debt-covenant considerations are believed to represent incentives leading to a reporting strategy that seeks to increase earnings and net-asset values (Watts and Zimmerman 1978, 1986, 1990, Beneish and Press 1993, Sweeney 1994, DeFond and Jiambalvo 1994, Dichev and Skinner 2002). This suggests that firms that are close to violating debt covenants will have incentives to avoid impairment losses (e.g Kvaal 2005, Zang 2008). In particular, firms with high debt-to-equity ratios are believed to be closer to violating debt covenants. These firms are predicted to avoid reporting decisions that increase debt-to-equity ratios, which suggests a negative association between debt-to-equity ratios and goodwill-impairment losses (Beneish and Press 1993, Sweeney 1994, DeFond and Jimbalvo 1994, Dichev and Skinner 2002, Riedl 2004).

Political-cost considerations are another potential candidate for earnings management. These incentives stem from the fact that accounting numbers may influence the degree to which firms are subject to regulations that impose political costs on them. This is particularly prominent if the firm is large, has significantly high earnings, large fluctuations in earnings or a significant market share, which makes the firm politically visible (Watts and Zimmerman 1978, 1986, 1990, Moses 1987, Gupta 1995). These firms are, therefore, predicted to report goodwill-impairment losses to depress earnings or reduce large positive changes in earnings. High levels of earnings or high fluctuations in earnings will probably be associated with income-smoothing incentives as much as political-cost considerations. Moreover, the firm's market share is not readily observable. This leaves firm size as a variable that may indicate political-cost considerations. Firm size, however, is a crude measure of political costs. Any association between firm size and goodwill-impairment losses must, therefore, be interpreted with caution. Hypotheses on earnings-management incentives are presented in table 5.4 below. They are in two versions: One version for impairment decisions and another version for size of impairment losses.

Table 5.4 Hypotheses on earnings-management incentives

Impairment decision	*Size of impairment losses*
H3u: Cash-bonus payments to COB, CEO and CFO are negatively associated with impairment decisions.	H3v: Cash-bonus payments to COB, CEO and CFO are negatively associated with size of impairment losses.
H3w: Conditional stocks held by COB, CEO and CFO are negatively associated with impairment decisions.	H3x: Conditional stocks held by COB, CEO and CFO are negatively associated with size of impairment losses.
H3y: Executive stock options held by COB, CEO and CFO are negatively associated with impairment decisions.	H3z: Executive stock options held by COB, CEO and CFO are negatively associated with size of impairment losses.
H3aa: Target-accounting incentives (pre-impairment earnings above target) are positively associated with impairment decisions.	H3ab: Target-accounting incentives (pre-impairment earnings above target) are positively associated with size of impairment losses.
H3ac: Big-bath accounting incentives (low pre-impairment earnings) are negatively associated with impairment decisions.	H3ad: Big-bath accounting incentives (low pre-impairment earnings) are negatively associated with size of impairment losses.
H3ae: Income-smoothing incentives (high pre-impairment earnings) are positively associated with impairment decisions.	H3af: Income-smoothing incentives (high pre-impairment earnings) are positively associated with size of impairment losses.
H3ag: Changes in COB, CEO and CFO are positively associated with impairment decisions.	H3ah: Changes in COB, CEO and CFO are positively associated with size of impairment losses.

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H3ai: Debt-covenant incentives (debt-to-equity ratio) are negatively associated with impairment decisions.	H3aj: Debt-covenant incentives (debt-to-equity ratio) are negatively associated with size of impairment losses.
H3ak: Firm size is positively associated with impairment decisions.	H3al: Firm size is positively associated with size of impairment losses.

5.3.3. Abnormal-impairment losses, earnings management and corporate governance

Goodwill-impairment losses might be overstated, understated or unbiased depictions of economic impairment in goodwill. The presence of earnings-management incentives are believed to increase the likelihood of misrepresentation of economic impairment. Earnings-management incentives predicted to be positively associated with impairment decisions and size of impairment losses are predicted to be positively associated with overstated impairment losses. Likewise, earnings-management incentives predicted to be negatively associated with impairment decisions and size of impairment losses are predicted to be negatively associated with understated impairment losses.

Elements of the remuneration package such as cash-bonus payments, conditional stocks and executive stock options are supposed to provide incentives for overstating net earnings. High cash-bonus payments, high conditional stockholdings and high stock-option holdings should, therefore, be associated with understated impairment losses. As understated impairment losses take negative values (Lapointe-Antunes et al. 2008, Zang 2008), negative associations are predicted between these remuneration elements and understated impairment losses. Debt-covenant incentives are supposed to provide incentives for understating net earnings. Similar to the remuneration elements, a negative association is predicted between debt-to-equity ratios and understated impairment losses. Some incentives are supposed to be associated with more and larger impairment losses rather than fewer and smaller impairment losses. These are predicted to be positively associated with overstated impairment losses. This is the case for target accounting, income smoothing, change in management and firm size. As the proxy for big-bath accounting takes negative values, a negative association is predicted between big-bath accounting incentives and overstated impairment losses.

The stated hypotheses, however, are not limited to predict associations between earnings-management incentives and either understated or overstated impairment losses. Rather, for a given earnings-management incentive, hypotheses are stated for associations between the earnings-management incentive and understated and overstated impairment losses, respectively. For instance, earnings-management incentives reflected by cash-bonus payments are believed to lead to understated impairment losses. A negative association is, therefore, predicted between these cash-bonus payments and understated impairment losses. To the extent these losses are overstated, the association between these cash-bonus payments and these losses should be negative. This is consistent with higher cash-bonus payments being associated with relatively less overstated impairment losses. All the hypotheses on associations between earnings-management incentives and understated or overstated impairment losses are derived in a similar way. The hypotheses on associations between earnings-management incentives and understated or overstated impairment losses are given in table 5.5 below:

Table 5.5 Hypotheses on earnings-management incentives and abnormal-impairment losses

Understated impairment losses	*Overstated impairment losses*
H4a: Cash-bonus payments to COB, CEO and CFO are negatively associated with understated impairment losses (negative abnormal-impairment losses).	H4b: Cash-bonus payments to COB, CEO and CFO are negatively associated with overstated impairment losses (positive abnormal- impairment losses).
H4c: Conditional stocks held by COB, CEO and CFO are negatively associated with understated impairment losses (negative abnormal-impairment losses).	H4d: Conditional stocks held by COB, CEO and CFO are negatively associated with overstated impairment losses (positive abnormal- impairment losses).
H4e: Executive stock options held by COB, CEO and CFO are negatively associated with understated impairment losses (negative abnormal-impairment losses).	H4f: Executive stock options held by COB, CEO and CFO are negatively associated with overstated impairment losses (positive abnormal- impairment losses).
H4g: Target-accounting incentives (pre-impairment earnings above target) are positively associated with understated impairment losses (negative abnormal-impairment losses).	H4h: Target-accounting incentives (pre-impairment earnings above target) are positively associated with overstated impairment losses (positive abnormal-impairment losses).
H4i: Big-bath accounting incentives (large reduction in pre-impairment earnings) are negatively associated with understated impairment losses (negative abnormal- impairment losses).	H4j: Big-bath accounting incentives (large reduction in pre-impairment earnings) are negatively associated with overstated impairment losses (positive abnormal-impairment losses).

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H4k: Income-smoothing incentives (large increase in pre-impairment earnings) are positively associated with understated impairment losses (negative abnormal-impairment losses).	H4l: Income-smoothing incentives (large increase in pre-impairment earnings) are positively associated with overstated impairment losses (positive abnormal-impairment losses).
H4m: Changes of COB, CEO and CFO are positively associated with understated impairment losses (negative abnormal-impairment losses).	H4n: Changes of COB, CEO and CFO are positively associated with overstated impairment losses (positive abnormal-impairment losses).
H4o: Debt-covenant incentives (debt-to-equity ratios) are negatively associated with understated impairment losses (negative abnormal-impairment losses).	H4p: Debt-covenant incentives (debt-to-equity ratios) are negatively associated with overstated impairment losses (positive abnormal- impairment losses).
H4q: Firm size is positively associated with understated impairment losses (negative abnormal-impairment losses).	H4r: Firm size is positively associated with overstated impairment losses (positive abnormal- impairment losses).

Corporate governance is an instrument to reduce the risk of opportunism in principal-agent relationships (Shleifer and Vishny 1997). Prior evidence has demonstrated that firms with efficient corporate governance have higher firm value, higher firm performance and suffer from lower agency costs (e.g. Weisbach 1988, Huson et al. 2001, Perry and Perry 2005, Perry and Shivdasani 2005). A complementary line of literature has demonstrated a negative association between corporate-governance mechanisms and earnings management (e.g. Warfield et al. 1995, Dechow et al. 1996, Beasley 1996, Chtourou et al. 2001, Klein 2002, Koh 2003, Xie et al. 2003, Peasnell et al. 2005, Davidson et al. 2005, Mulgrew and Forker 2006, Ebrahim 2007, Koh et al. 2007). Managers disciplined by efficient corporate-governance mechanisms will probably avoid opportunism and use their reporting discretion to reveal private information and report accounting numbers consistent with the firm's underlying economics. In contrast, given incentives to manipulate and inefficient corporate-governance structures, managers are more inclined to exploit the reporting discretion and report accounting numbers that do not accurately reflect economic fundamentals.

The literature provides lots of evidence suggesting that corporate-governance mechanisms are associated with less earnings management, less financial fraud and higher earnings quality and accrual quality (e.g. Warfield et al. 1995, Dechow et al. 1996, Beasley 1996, Chtourou et al. 2001, Klein 2002, Koh 2003, Xie et al. 2003, Peasnell et al. 2005, Davidson et al. 2005, Mulgrew and Forker 2006, Ebrahim 2007, Koh et al. 2007). The literature has investigated a vast number of corporate-governance proxies. The most common proxies relate to board and audit-committee characteristics and other monitoring mechanisms represented by blockholders, external auditors and cross-listing. Compensation contracts and debt contracts are also potential corporate-governance candidates (e.g. Dey 2008). These contracts are indeed established to align the interests of the managers with those of the shareholders and the debtholders. If contracting is inefficient, however, they might well motivate for opportunism rather than prevent opportunism (Watts and Zimmerman 1990, Xie, et al. 2003). Given this assumption, they should be considered as potential sources of earnings-management incentives rather than corporate-governance mechanisms.

Several board and audit-committee characteristics are believed to reflect corporate governance such as size, independence, activity and expertise. Board size is a frequently investigated indicator of corporate governance. The evidence on board size being a corporate-governance mechanism is mixed. The common notion is that smaller boards are more efficient (Lipton and Lorsch 1992, Yermack 1996, Jensen 2000) and less likely controlled by managers (Dechow et al. 1996, Core et al. 1999, Jensen 2000). Consistent with this, the literature demonstrates a negative association between board size and firm performance (e.g. Yermack 1996, Mak and Kusnadi 2002, Ødegaard and Bøhren 2004). The association between board size and earnings management is not easily understood. Smaller boards are supposed to be more efficient. At the same time, larger boards will probably have more experienced directors and more independent non-executive directors (Xie et al. 2003). The literature also demonstrates mixed results. Some studies report a negative association between board size and earnings management consistent with larger boards being more efficient monitors (e.g. Chtourou et al. 2001, Xie et al. 2003, Ebrahim 2007). Others report a weak association or no association (e.g. Dechow et al. 1996, Abbott et al. 2000, Vafeas 2005). Given the above findings, it is expected that the incidence of earnings management will vary across firms with different board size. As the majority of the literature suggests that smaller boards are more efficient than larger boards, smaller boards are predicted to be associated with less misrepresentation of economic impairment (less understated or overstated impairment losses).

Board independence and board activity are supposed to be important indicators of the monitoring efficiency of the board. The association between board independence and earnings management is expected to be negative. Higher proportion of independent directors is supposed to make the board more efficient in monitoring managers and thereby constrain the opportunities for managerial opportunism (e.g. Xie et al. 2003:306). Several studies have demonstrated a negative association between independence and earnings management (e.g.

Beasley 1996, Dechow et al. 1996, Klein 2002, Xie et al. 2003, Farber 2005, Vafeas 2005, Peasnell et al. 2005, Davidson et al. 2005, Ebrahim 2007, Koh et al. 2007). Some studies, however, have failed to find a relationship between board independence and earnings management (e.g. Chtourou et al. 2001, Mulgrew and Forker 2006). Nevertheless, compelling evidence supports the notion that more independent non-executive directors lead to less earnings management. More independent non-executive directors are, therefore, predicted to be associated with less misrepresentation of economic impairment.

Board activity is generally indicated by the number of board meetings. More board meetings suggest higher activity and less earnings management. This rests on the notion that more active boards are more efficient monitors of the managers, which in turn reduces managerial opportunism and earnings management (e.g. Xie et al. 2003). Some studies demonstrate a negative association between board meetings and abnormal accruals (e.g. Xie et al. 2003). Others, however, report evidence inconsistent with these findings. Vafeas (1999), for instance, reports a negative association between board activity and firm value, and Davidson et al. (2005), Ebrahim (2007) and Koh et al. (2007) find a positive association between board meetings and earnings management. These findings, however, can be driven by correlated-omitted variables and endogeneity problems, which turns the association positive. Taken together, it is reasonable to predict that more board activity will lead to less misrepresentation of economic impairment.

Managerial stockholdings are supposed to be efficient in aligning the interests of the managers with those of the shareholders and thus, an important remedy to prevent opportunism (e.g. Jensen and Meckling 1976, Fama 1980, Fama and Jensen 1983). Warfield et al. (1995) find a negative association between managerial stockholdings and abnormal accruals suggesting that managerial stockholdings reduce earnings management. Others, such as Klein (2002), report a weak positive association between managers' stockholdings and earnings management. Moreover, several studies have demonstrated that the relationship between managerial stockholdings and agency costs is non-linear (Morck et al. 1988, McConnell and Servaes 1990, 1995, Short and Keasey 1999, Hutchinson and Leung 2007). Still, it is reasonable to expect that managerial stockholdings to some extent have the potential to align the interests of the managers with those of the shareholders. Taken together, it is predicted that larger managerial stockholdings will lead to less misrepresentation of economic impairment.

Similar to the full board, audit-committee size, activity and expertise are supposed to indicate corporate governance. The primary role of the audit committee is to monitor the financial-reporting process, which certainly demands some expertise in accounting. Xie et al. (2003) find evidence that financial expertise reduces the likelihood of earnings management. Similar evidence is reported by McMullan and Raghunanadan (1996), Chtourou et al. (2001) and Bedard et al. (2004). Moreover, Dhaliwal et al. (2006) reports a positive association between financial expertise and accrual quality, and Krishnan and Visvanathan (2007) find evidence of a positive association between financial-accounting expertise and conservatism. In sum, it is predicted that more financial-accounting expertise on the audit committee will lead to less misrepresentation of economic impairment.

The size of the audit committee and the audit-committee activity are also investigated in prior studies. The association between audit-committee size and earnings management is found to be rather weak and somewhat inconsistent (e.g. Xie et al. 2003, Bedard et al. 2004). Still, it is reasonable to believe that more audit-committee members will lead to more expertise and monitoring resources, which in turn increases the efficiency of the committee. This suggests that larger audit committees are associated with less misrepresentation. The results for audit-committee activity, however, are somewhat stronger. Chtourou et al. (2001), Xie et al. (2003) and Ebrahim (2007) find a negative association between the number of audit-committee meetings and earnings management. Moreover, McMullan and Raghunandan (1996) and Abbott et al. (2000) find that the likelihood of financial fraud and earnings restatements are lower if the firm has frequent audit-committee meetings. And finally, a positive association is found between audit-committee activity and the information content of earnings (e.g. Anderson et al. 2004). This suggests that more audit-committee activity is associated with less misrepresentation of economic impairment.

Outside blockholders are believed to be an important monitor of the managers (e.g. Smith 1976, Jensen and Meckling 1976, Shleifer and Vishney 1986:462). Dechow et al. (1996) find evidence that outside blockholders are negatively associated with financial fraud, and Xie et al. (2003) report a negative, but insignificant association between blockholdings and earnings management. Lapointe-Antunes et al. (2008) report a significantly negative association between transitional goodwill-impairment losses and blockholders. Taken together, this suggests that blockholders will monitor the managers and make an effort to prevent earnings management. More blockholders are, therefore, predicted to be associated with less misrepresentation of economic impairment.

Cross-listing on the New York Stock Exchange or the NASDAQ Stock Exchange is supposed to reduce the incidence of opportunistic earnings management due to strict disclosure regulations and enforcement (Lang et al. 2003, Bailey et al. 2006).

Lang et al. (2003) find that firms cross-listed in the US are less aggressive in terms of earnings management. Bailey et al. (2006) report that cross-listing in the US leads to less earnings management due to better corporate-governance structures and more transparent information environment. This suggests that cross-listing on the New York Stock Exchange or the NASDAQ Stock Exchange is associated with less misrepresentation of economic impairment. Hypotheses on corporate-governance mechanisms and overstated and understated impairment losses are given in table 5.6 below:

Table 5.6 Hypotheses on corporate-governance and abnormal-impairment losses

Understated impairment losses	*Overstated impairment losses*
H4s: Board size is positively associated with understated impairment losses (negative abnormal-impairment losses).	H4t: Board size is negatively associated with overstated impairment losses (positive abnormal-impairment losses).
H4u: Board independence is positively associated with understated impairment losses (negative abnormal-impairment losses).	H4v: Board independence is negatively associated with overstated impairment losses (positive abnormal-impairment losses).
H4w: Board activity is positively associated with understated impairment losses (negative abnormal-impairment losses).	H4x: Board activity is negatively associated with overstated impairment losses (positive abnormal-impairment losses).
H4y: Stocks held by COB, CEO and CFO are positively associated with understated impairment losses (negative abnormal- impairment losses).	H4z: Stocks held by COB, CEO and CFO are negatively associated with overstated impairment losses (positive abnormal- impairment losses).

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H4aa: Audit-committee expertise is positively associated with understated impairment losses (negative abnormal-impairment losses).	H4ab: Audit-committee expertise is negatively associated with overstated impairment losses (positive abnormal-impairment losses).
H4ac: Audit-committee size is positively associated with understated impairment losses (negative abnormal-impairment losses).	H4ad: Audit-committee size is negatively associated with overstated impairment losses (positive abnormal-impairment losses).
H4ae: Audit-committee activity is positively associated with understated impairment losses (negative abnormal-impairment losses).	H4af: Audit-committee activity is negatively associated with overstated impairment losses (positive abnormal-impairment losses).
H4ag: Blockholdings are positively associated with understated impairment losses (negative abnormal-impairment losses).	H4ah: Blockholdings are negatively associated with overstated impairment losses (positive abnormal-impairment losses).
H4ai: Blockholders are positively associated with understated impairment losses (negative abnormal-impairment losses).	H4aj: Blockholders are negatively associated with overstated impairment losses (positive abnormal-impairment losses).
H4ak: Cross-listing is positively associated with understated impairment losses (negative abnormal-impairment losses).	H4al: Cross-listing is negatively associated with overstated impairment losses (positive abnormal-impairment losses).

6. Methodological choices

This chapter discusses the methodological design. The chapter is structured into four subchapters: one for each research question.

6.1. Model specification – value relevance of goodwill under the impairment-only method

The first research question concerns the value relevance of goodwill under current IFRS. Three hypotheses are formulated: Book goodwill is positively associated with stock prices (hypothesis 1a), goodwill-impairment losses are negatively associated with stock prices (hypothesis 1b) and goodwill-impairment losses are negatively associated with stock returns (hypothesis 1c). Price-book-earnings regressions and return-earnings regressions are employed. The return-regression model is believed to suffer from less econometrical problems than the price-level regression model due to better control for correlated-omitted variables and less problems of heteroscedasticity (e.g. Kothari and Zimmerman 1995, Wooldridge 2009:458-59). There is, however, no general consensus on which model to prefer. The choice of model should be based on the research questions and hypotheses to be tested by the model and potential econometrical problems of the model (Landsman and Magliolo 1988, Kothari and Zimmerman 1995, Barth 2001, Barth et al. 2001, Beaver 2002). The research questions in chapter one and the hypotheses in chapter five suggest that both regression models rather than just the return-regression model should be employed. Still, potential econometrical problems of these models will be carefully investigated in the empirical analysis.

The first and the second hypotheses, 1a and 1b, are tested by a price-book-earnings regression based on the Feltham-Ohlson framework. This model is appropriate to investigate the extent to which accounting numbers reflect the same information as in stock prices (McCarthy and Schneider 1995, Barth 2000). Besides, this model is frequently used in prior research investigating the value relevance of goodwill (Jennings et al. 1996a, Huijgen 1996, Vincent 1997, Petersen 2001, 2002). The following pooled regression is employed to test hypotheses 1a and 1b (all independent variables are deflated by number of outstanding common stocks at fiscal-year end t):

Table 6.1 Regression model to test hypotheses 1a and 1b

$$P_{i,t} = \alpha_0 + \alpha_1 (E + GIM)_{i,t} + \alpha_2 GIM_{i,t} + \alpha_3 (EQ - GW)_{i,t-1} + \alpha_4 GW_{i,t-1} + \varepsilon_{i,t}$$

where

$P_{i,t}$	=	Stock price of firm *i*, time *t* (fiscal-year end).
$(E + GIM)_{i,t}$	=	Pre-impairment net earnings of firm *i*, period *t*.
$GIM_{i,t}$	=	Reported goodwill-impairment losses of firm *i*, period *t*.
$(EQ - GW)_{i,t-1}$	=	Book value of equity less book value of goodwill of firm *i*, time *t-1*.
$GW_{i,t-1}$	=	Book value of goodwill of firm *i*, time *t-1*.
$\varepsilon_{i,t}$	=	Residual of firm *i*, time *t*.

The regression coefficients of main interest are α_2 and α_4. A significantly positive coefficient on book goodwill *(GW)*, α_4, supports hypothesis 1a. This suggests that goodwill should be classified as an asset and capitalised on the balance sheet. A significantly negative coefficient on goodwill-impairment losses *(GIM)*, α_2, supports hypothesis 1b. This suggests that goodwill-impairment losses reflect economic impairment. The above regression model is deflated by number of outstanding common stocks. This is the common deflator in price-book earnings regressions (e.g. Jennings et al. 1996a, Huijgen 1996, Vincent 1997, Francis and Shipper 1999, Barth et al. 2008, Kang and Zhao 2010, Gjerde et al. 2011). Still, the relation between number of outstanding common stocks and scale is not one-to-one. This suggests that the above model might be affected by scale effects even after deflating the variables with number of outstanding common stocks, which suggests that alternative scale proxies should be employed as robustness tests (e.g. Petersen 2001, 2002, Gjerde et al. 2011).

Hypothesis 1c is tested by the return-earnings regression model. This model can be theoretically justified with reference to the Feltham-Ohlson framework (See appendix C) and is appropriate when investigating the extent to which accounting numbers reflect the same information as in stock returns (Barth 2000, Barth et al. 2001). The model is frequently used in the literature investigating value relevance of goodwill-amortisation charges and goodwill-impairment losses (Jennings et al. 1996a, Henning et al. 2000, Petersen 2001, 2002, Chen et al. 2004). The following regression is employed to test hypothesis 1c (all variables are deflated by market value at time t-1):

Table 6.2 Regression model to test hypothesis 1c

$$R_{i,t} = \alpha_0 + \alpha_1 (E + GIM)_{i,t} + \alpha_2 \Delta(E + GIM)_{i,t,t-1} + \alpha_3 GIM_{i,t} + \alpha_4 \Delta GIM_{i,t,t-1} + \varepsilon_{i,t}$$

where

$R_{i,t}$	=	Stock return/market return of firm *i*, period *t* (fiscal year).
$(E+GIM)_{i,t}$	=	Pre-impairment net earnings of firm *i*, period *t*.
$\Delta(E+GIM)_{i,t,t-1}$	=	Changes in pre-impairment net earnings of firm *i*, from period *t-1* to *t*.
$GIM_{i,t}$	=	Reported goodwill-impairment losses of firm *i*, period *t*.
$\Delta GIM_{i,t,t-1}$	=	Changes in reported goodwill-impairment losses of firm *i*, from period *t-1* to *t*.
$\varepsilon_{i,t}$	=	Residual of firm *i*, time *t*.

The coefficient of main interest is α_3. A significantly negative coefficient on goodwill-impairment losses *(GIM)* supports hypothesis 1c, which suggests that these losses are timely reported and value relevant. Following the theoretical derivation of the return-earnings model in appendix C and previous work by Landsman and Magliolo (1988) and Easton and Harris (1991), both levels and changes in net earnings are included as explanatory variables. The reasoning behind this is that levels in net earnings are believed to capture the stable component of net earnings, whereas changes in net earnings represent the unexpected component of net earnings. The changes are calculated by deducting net earnings the previous year from net earnings the current year. Net-earnings levels *(E+GIM)* and net-earnings changes *(ΔGIM)* are predicted to be positively associated with stock returns. For the sake of completeness, changes in goodwill-impairment losses *(ΔGIM)* are also included as explanatory variable. The return-earnings model is supposed to be less affected by problems caused by scale, heteroscedasticity and correlated-omitted variables (e.g. Kothari and Zimmerman 1995, Wooldridge 2009:458-59).

6.2. Model specification – value relevance of goodwill reported under alternative accounting methods

The second research question concerns the value relevance of goodwill reported under alternative accounting methods. Hypotheses 2a and 2b predict no association between goodwill-amortisation charges, stock prices and stock returns, respectively, when goodwill is accounted for under the amortisation-only method. Similarly, hypotheses 2c and 2d predict no association between goodwill-amortisation charges, stock prices and stock returns, respectively, when goodwill is accounted for under the amortisation-and-impairment method. Hypothesis 2e and 2f concern the relative value relevance of goodwill when reported under alternative accounting methods. Hypothesis 2e (2f) predicts that goodwill-accounting numbers reported under an impairment-only method explain variation in stock prices (stock returns) to a larger extent than goodwill numbers reported under the amortisation-only method or the amortisation-and-impairment method. The relative value relevance is investigated by comparing adjusted R-squares from regressions of accounting numbers under these three methods. The test is conducted by comparing adjusted R-squares from value-relevance regressions on accounting numbers under the impairment-only method (current IFRS) with as-if adjusted numbers under alternative methods. This procedure is believed to provide a strong test of the relative value relevance. All potential variables affecting the value relevance across these accounting methods are controlled for by using the same set of firm-year observations (the same sample firms for the same time period) in all the regressions.

An alternative approach would be to run a pre-post test where as-accounted numbers under the current regulation are compared with as-accounted numbers under previous regulation. This approach, however, has several caveats. A difference in value relevance of goodwill when moving from the pre-period to the post-period might be explained by correlated-omitted variables. A proper control must, therefore, be ensured for potentially correlated-omitted variables before addressing any difference in value relevance to change of accounting methods. Besides, using as-if accounted numbers makes it possible to investigate accounting methods that have not previously been implemented in financial accounting, for instance, an amortisation-only method for goodwill or a permant-retention method. In contrast to previous studies (e.g. Petersen 2001, 2002, Chambers 2007), the firms' own amortisation period is used when calculating the as-if amortisation charges of goodwill. In Chambers (2007) all firms are forced to follow given amortisation periods of 5, 10, 15 or 20 years. This provides no basis for true comparisons of alternative accounting methods involving goodwill amortisation. Moreover, economic lifetime of goodwill is believed to vary across firms and industries, which even more justifies the use of actual amortisation periods rather than arbitrary periods when calculating as-if accounting numbers. To test hypothesis 2a, the following regression is employed (all independent variables are deflated by number of outstanding stocks at fiscal-year end time t):

Table 6.3 Regression model to test hypothesis 2a

$$P_{i,t} = \alpha_0 + \alpha_1 (E + GIM)_{i,t} + \alpha_2 GAM + \alpha_3 (EQCA - GWCA)_{i,t-1} + \alpha_4 GWCA_{i,t-1} + \varepsilon_{i,t}$$

where

$P_{i,t}$	=	Stock price of firm *i*, time *t* (fiscal-year end).
$(E + GIM)_{i,t}$	=	Pre-impairment net earnings of firm *i*, period *t*.
$GAM_{i,t}$	=	As-if calculated goodwill-amortisation charges of firm *i*, period *t* (amortisation-only method).
$(EQCA - GWCA)_{i,t-1}$	=	As-if calculated book value of equity less as-if calculated book value of goodwill of firm *i*, time *t-1* (amortisation-only method).
$GWCA_{i,t-1}$	=	As-if calculated book value of goodwill of firm *i*, time *t-1* (amortisation-only method).
$\varepsilon_{i,t}$	=	Residual of firm *i*, time *t*.

Both book goodwill *(GWCA)* and book equity *(EQCA)* are affected by the chosen accounting method. Book goodwill and book equity are, therefore, included with their as-if calculated numbers in the above regression. An insignificant coefficient on goodwill-amortisation charges *(GAM)*, α_2, supports hypothesis 2a, which suggests that these charges lack any association with stock prices. The following regression is employed to test hypothesis 2b (all variables are deflated by market value at time t-1):

Table 6.4 Regression model to test hypothesis 2b

$$R_{i,t} = \alpha_0 + \alpha_1 (E + GIM)_{i,t} + \alpha_2 \Delta (E + GIM)_{i,t,t-1} + \alpha_3 GAM_{i,t} + \alpha_4 \Delta GAM_{i,t-1} + \varepsilon_{i,t}$$

where

$R_{i,t}$	=	Stock return/market return of firm *i*, period *t* (fiscal year).
$(E + GIM)_{i,t}$	=	Pre-impairment net earnings of firm *i*, period *t*.
$\Delta (E + GIM)_{i,t,t-1}$	=	Changes in pre-impairment earnings of firm *i*, from period *t-1* to *t*.
$GAM_{i,t}$	=	As-if calculated goodwill-amortisation charges of firm *i*, period *t* (amortisation-only method).
$\Delta GAM_{i,t,t-1}$	=	Changes in as-if calculated goodwill-amortisation charges of firm *i*, from period *t-1* to *t* (amortisation-only method).
$\varepsilon_{i,t}$	=	Residual of firm *i*, time *t*.

The coefficient of main interest is α_3. Similar to hypothesis 2a, an insignificant coefficient on goodwill-amortisation charges *(GAM)*, α_3, supports hypotheses 2b, which suggests that goodwill-amortisation charges lack any association with stock returns. Similar regressions are employed to test hypothesis 2c and 2d. These regressions test the value relevance of goodwill when reported under a combined amortisation-and-impairment method. The hypotheses predict that goodwill-amortisation charges are not associated with stock prices (hypothesis 2c) or stock returns (hypothesis 2d) when goodwill is accounted for under the combined amortisation-and-impairment method. To test hypothesis 2c, the following regression is employed (all independent variables are deflated by number of outstanding stocks at fiscal-year end time t):

Table 6.5 Regression model to test hypothesis 2c

$$P_{i,t} = \alpha_0 + \delta_1 (E + GIM)_{i,t} + \alpha_2 GAMC_{i,t} + \alpha_3 GIMC_{i,t} + \alpha_4 (EQCAI - GWCAI)_{i,t-1} + \alpha_5 GWCAI_{i,t-1} + \varepsilon_{i,t}$$

where

$P_{i,t}$	=	Stock price of firm *i*, time *t* (fiscal-year end).
$(E + GIM)_{i,t}$	=	Pre-impairment net earnings of firm *i*, period *t*.
$GAMC_{i,t}$	=	As-if calculated goodwill-amortisation charges of firm *i*, period *t* (amortisation-and-impairment method).
$GIMC_{i,t}$	=	As-if calculated goodwill-impairment losses of firm *i*, period *t* (amortisation-and-impairment method).
$(EQCAI - GWCAI)_{i,t-1}$	=	As-if calculated book value of equity less as-if calculated book value of goodwill of firm *i*, time *t-1* (amortisation-and-impairment method).
$GWCAI_{i,t-1}$	=	As-if calculated book value of goodwill of firm *i*, time *t-1* (amortisation-and-impairment method).
$\varepsilon_{i,t}$	=	Residual of firm *i*, time *t*.

The coefficient of main interest is α_2. An insignificant coefficient on goodwill-amortisation charges *(GAMC)*, α_2, supports hypotheses 2c that these charges lack any association with stock prices. Book goodwill *(GWCAI)* is predicted to be significantly positively associated with stock prices, whereas goodwill-impairment losses *(GIMC)* are predicted to be significantly negatively associated with stock prices. The following regression is employed to test hypothesis 2d (all variables are deflated by market value at time t-1):

Table 6.6 Regression model to test hypothesis 2d

$$R_{i,t} = \alpha_0 + \alpha_1 (E + GIM)_{i,t} + \alpha_2 \Delta(E + GIM)_{i,t,t-1} + \alpha_3 GAMC_{i,t} + \alpha_4 GIMC_{i,t} + \alpha_5 \Delta GAMC_{i,t,t-1} + \alpha_6 \Delta GIMC_{i,t,t-1} + \varepsilon_{i,t}$$

where

$R_{i,t}$	=	Stock return/market return of firm *i*, period *t* (fiscal year).
$(E + GIM)_{i,t}$	=	Pre-impairment net earnings of firm *i*, period *t*.
$\Delta(E + GIM)_{i,t,t-1}$	=	Changes in pre-impairment earnings of firm *i*, from period *t-1* to *t*.
$GAMC_{i,t}$	=	As-if calculated goodwill-amortisation charges of firm *i*, period *t* (amortisation-and-impairment method).
$GIMC_{i,t}$	=	As-if calculated goodwill-impairment losses of firm *i*, period *t* (amortisation-and-impairment method).
$\Delta GAMC_{i,t,t-1}$	=	Changes in as-if calculated goodwill-amortisation charges of firm *i*, from period *t-1* to *t* (amortisation-and-impairment method).
$\Delta GIMC_{i,t,t-1}$	=	Changes in as-if calculated goodwill-impairment losses of firm *i*, from period *t-1* to *t* (amortisation-and-impairment method).
$\varepsilon_{i,t}$	=	Residual of firm i, time t.

The coefficient of main interest is α_3. An insignificant coefficient on goodwill-amortisation charges *(GAMC)*, α_3, supports hypothesis 2d that these charges lack any association with stock returns. Levels and changes in goodwill-impairment losses *(GIMC, ΔGIMC)* are predicted to be significantly negatively associated with stock returns.

Hypotheses 2e and 2f predict differences in value relevance when goodwill is reported under alternative methods. Differences or changes in value relevance across accounting standards, industries, accounting regimes or over time are often investigated by R-square comparisons (e.g. Harris, Lang and Möller 1994, Jennings, Simko, Thompson II 1996, Biddle, Seow and Siegel, 1995, Barth, Beaver and Landsman 1998, Ali and Hwang 2000, Ball, Kothari and Robin 2000, Jennings et al. 2001, Ball, Robin and Wu 2003, Chambers 2007). Brown, Lo and Lys (1999) demonstrate serious problems related to between-sample comparisons of R-squares. These comparisons might be invalid. Gu (2007) finds similar evidence and suggests that the standard-deviation of the residuals should be used as a measure of value relevance instead of R-square. The criticism expressed by Brown et al. (1999) and Gu (2007) may have little relevance for this study. Rather than comparing R-squares of regressions on observations from two different samples, R-squares will be compared for two regressions run on the same sample. This mitigates the between-sample problems addressed by Brown et al. (1999) and Gu (2007).

Several arguments support the use of R-square. The R-square statistic measures the value relevance of the accounting system. It signifies the extent to which variation in accounting numbers such as goodwill explain variation in stock prices or stock returns. As the accounting method of goodwill is what changes across the regressions, any differences in R-squares can be attributed to the shift in accounting methods. Besides, the use of R-square makes it possible to compare the results from this study using IFRS-data with prior results reported by Chambers (2007) on US-GAAP data. As the number of parameters varies across the regressions, the adjusted R-squares, not the simple R-squares, are compared. The following regressions will be run to test hypotheses 2e and 2f (all independent variables in price-book-earnings regressions are deflated by number of outstanding stocks at fiscal-year end time t, and all variables in return-earnings regressions are deflated by market value at time t-1):

Table 6.7 Regression models to test hypotheses 2e and 2f

$$P_{i,t} = \alpha_0 + \alpha_1 (E + GIM)_{i,t} + \alpha_2 GIM_{i,t} + \alpha_3 (EQ - GW)_{i,t-1} + \alpha_4 GW_{i,t-1} + \varepsilon_{1i,t}$$
$$P_{i,t} = \beta_0 + \beta_1 (E + GIM)_{i,t} + \beta_2 GAM_{i,t} + \beta_3 (EQCA - GWCA)_{i,t-1} + \beta_4 GWCA_{i,t-1} + \varepsilon_{2i,t}$$
$$P_{i,t} = \delta_0 + \delta_1 (E + GIM)_{i,t} + \delta_2 GAMC_{i,t} + \delta_3 GIMC_{i,t} + \delta_4 (EQCAI - GWCAI)_{i,t-1} +$$
$$\delta_5 GWCAI_{i,t-1} + \varepsilon_{3i,t}$$

$$R_{i,t} = \gamma_0 + \gamma_1 (E + GIM)_{i,t} + \gamma_2 \Delta(E + GIM)_{i,t,t-1} + \gamma_3 GIM_{i,t} + \gamma_4 \Delta GIM_{i,t,t-1} + \varepsilon_{4i,t}$$
$$R_{i,t} = \eta_0 + \eta_1 (E + GIM)_{i,t} + \eta_2 \Delta(E + GIM)_{i,t,t-1} + \eta_3 GAM_{i,t} + \eta_4 \Delta GAM_{i,t,t-1} + \varepsilon_{5i,t}$$
$$R_{i,t} = \rho_0 + \rho_1 (E + GIM)_{i,t} + \rho_2 \Delta(E + GIM)_{i,t,t-1} + \rho_3 GAMC_{i,t} + \rho_4 GIMC_{i,t} + \rho_5 \Delta GAMC_{i,t,t-1} +$$
$$\rho_6 \Delta GIMC_{i,t,t-1} + \varepsilon_{6i,t}$$

The variables are specified previously.

$\varepsilon_{m,i,t}$ = Residual of firm *i*, time *t* in regression *m* where $m \in [1,6]$.

Net earnings, book equity, amortisation charges and impairment losses will be determined by the chosen accounting method for goodwill. Current year's goodwill-impairment losses and goodwill-amortisation charges will affect the end of the year's book equity and book goodwill. This makes it necessary to specify different variables under the as-accounting method (current IFRS) and the alternative as-if accounting methods for goodwill. Hypotheses 2e and 2f are supported if accounting numbers under the impairment-only method explain variation in stock prices or stock returns to a larger extent than alternative methods for goodwill. When comparing alternative accounting methods, the accounting system with the highest adjusted R-square is interpreted as the one providing the most value-relevant accounting numbers. At least two different procedures can be used to test differences in adjusted R-squares for pairs of regressions run on one sample: z-test based on bootstrapped standard errors of the difference in adjusted R-squares and z-test based on Vuong's (1989) likelihood-ratio statistics.

Bootstrapping is a common approach to obtain standard errors of an estimate where the probability distribution of the estimate is unknown or difficult to determine with accuracy.[14] The estimation is done by drawing a large number of new samples with replacement from the original sample (Efron and Tibshirani 1986). This results in samples consisting of the initial firm-year observations, but with observations appearing multiple times. The standard errors of the difference in adjusted R-squares are obtained by running each pair of regression on each sample, collect the R-squares from each regression and calculate the R-square difference. Rerunning this procedure 1000 times, leads to 1000 R-square differences. Given the Central Limit Theorem, the sampling distribution of the R-square difference will become asymptotically close to a normal distribution as the number of samples increases. Using the variance of the estimated R-square differences as an estimate of the population variance, the difference in R-squares can be tested by a z-test.

Vuong (1989) has derived a likelihood-ratio test for model selection to test the null hypothesis that a pair of two competing models is equally close to explaining the true data-generating process against the alternative hypothesis that one is closer than the other. The difference between the Vuong test and alternative tests for competing models is that Vuong has derived the distribution of the likelihood-ratio statistic under the null hypothesis that neither model is true. This means that the Vuong test allows both models to have explanatory power, but provides direction concerning which of the two is closer to the "true data-generating process". The test model is based on the residual sum of squares from pairs of two competing models. As the models have the same dependent variables (and are run for the

[14] R-square estimates are known to be beta distributed. The beta distribution is a non-trivial two-parameter probability distribution (e.g. Miller and Miller 1999:204-205, Greene 2000:80).

same firm-year observations), the total sum of squares are identical. The residual sum of squares is used as a basis to form a log-likelihood statistic for each firm-year observation. The sum and variance of the log-likelihoods are used to form a z-test (Vuong 1989, Dechow 1994).[15] The test is directional in the sense that if the z-value indicates a significantly positive difference in likelihood-ratio statistics, the test suggests that the first model is the model of choice. If the z-value shows a significantly negative difference, the opposite conclusion should be drawn.

6.3. Model specification – goodwill-impairment losses, economic variables and earnings-management incentives

The third research question focuses on two sets of variables that might be associated with goodwill-impairment losses: economic variables reflecting economic impairment in goodwill and variables reflecting earnings-management incentives (e.g. Francis et al. 1996, Riedl 2004, Kvaal 2005, Zang 2008). As no causal relationship can be established, a demonstrated association between goodwill-impairment losses and these variables should not be interpreted as if these variables are determinants of impairment losses. Rather, significant associations should be interpreted as if these variables *play a role in the reporting process* of impairment losses.

In the earnings-management literature, four different regression models are employed to investigate the extent to which impairment losses are associated with economic variables and/or earnings-management incentives: ordinary-least-square regression, tobit regression and probit and logit regression. The ordinary-least-square regression is based on the assumption of linear parameters. The tobit,

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[15]The program code necessary to employ this test in STATA is available at http://personal.anderson.ucla.edu/judson.caskey/programs/vuong.ado.

probit and logit regression, however, are non-linear in their parameters (Wooldridge 2009). The choice of regression model is determined by the dependent variable. When this variable is continuous with unlimited range, the ordinary-least-square regression is the preferred choice. Censored regressions such as tobit regressions are preferable when the dependent variable is continuous, but censored at certain limits (Maddala 1991). Probit and logit regressions, however, are preferable when the dependent variable is binary.

Two sets of hypotheses are formulated. The first set concerns the decision to report impairment losses, and the second set concerns the size of impairment losses. The first set of hypotheses is tested by a logit regression since the dependent variable, the choice to report an impairment loss, is binary. A probit regression is an alternative choice. Maddala (1991) argues, however, that the probit-regression coefficients will be affected when the sampling rates are unequal (the number of impairment observations versus non-impairment observations). In contrast, the logit-regression coefficients are unaffected and should be the chosen model here. The logit regression will estimate the likelihood of reporting an impairment loss in goodwill given economic variables and variables for earnings-management incentives. The second set of hypotheses is tested by a tobit regression. This regression is preferable to truncated regression as the dependent variable, the reported impairment loss, is censored at zero whereas the explanatory variables are unlimited (Maddala 1991). The tobit regression will estimate associations between goodwill-impairment losses, economic variables and variables for earnings-management incentives.

There might be problems of self-selection. Self-selection bias occurs when observations self-select into discrete groups, for instance a group of impairers and non-impairers. A control for self-selection bias might be performed by employing a two-stage Heckman-selection model (Heckman 1979). The first stage runs the selection regression with impairment decision *(IMP_DECISION)* as the dependent variable. This regression includes those variables that are expected to explain the impairment decision. The next stage runs a regression with impairment losses *(IMP_AMOUNT)* as dependent variable. This regression includes those variables that are supposed to explain the size of impairment losses. Recent studies have employed this approach when investigating determinants of impairment losses (e.g. Beatty and Weber 2006, Lys, Vincent and Yehuda 2011). These studies employ almost identical sets of explanatory variables in stage one and two and provide no theoretical or intuitive arguments for why variables are excluded in regression two.

A recent paper by Francis, Lennox and Wang (2010) investigates the use of selection models in financial-accounting research. They examine 58 articles published in top accounting journals over the period 2000-2009. These studies are found to have implemented the selection models in a rather mechanical way with limited arguments for the choice of variables explaining or not explaining the selection process. The selection regression needs at least one unique variable that is expected to explain the selection, that is, the impairment decision. Strong arguments must be provided for why these variables are important determinants of the selection process. When it comes to the impairment decision, no such strong arguments can be found for any of the economic variables or earnings-management variables. Rather, it is likely that most if not all of the economic variables and earnings-management variables are potential candidates explaining the impairment decisions and the size of impairment losses. Besides, the choice of which variables to include and exclude from either of these two regressions, will strongly affect the results (e.g. Francis et al. 2010). The two-step Heckman selection model should, therefore, be used with caution, especially in cases where there are no strong arguments for which variables to use as selection variables. This suggests that the same sets of explanatory variables should be employed to explain the impairment decision *(IMP_DECISION)* and the size of the impairment losses *(IMP_AMOUNT)*. Rather than being run jointly, using the two-stage Heckman selection model, the logit regressions *(IMP_DECISION)* and the tobit regressions *(IMP_AMOUNT)* are run separately.

Table 6.8 Regression models to test hypotheses 3a to 3al

$$IMP\_DECISION_{i,t} = \alpha_0 + \alpha_1 \Delta GDP_{t,t-1} + \alpha_2 \Delta UNEMPLOY\%_{t,t-1} + \alpha_3 \Delta INDROA_{i,t,t-1} + \alpha_4 \Delta INDRET_{i,t,t-1} + \alpha_5 RET_{i,t} + \alpha_6 \Delta SALES\%_{i,t,t-1} + \alpha_7 \Delta ROA_{i,t,t-1} + \alpha_8 \Delta OCF\%_{i,t,t-1} + \alpha_9 BM_{i,t} + \alpha_{10} DIFFBM_{i,t} + \alpha_{11} HIST_{i,t} + \alpha_{12} COB\_BON_{i,t} + \alpha_{13} CEO\_BON_{i,t} + \alpha_{14} CFO\_BON_{i,t} + \alpha_{15} COB\_COSTOCK_{i,t} + \alpha_{16} CEO\_COSTOCK_{i,t} + \alpha_{17} CFO\_COSTOCK_{i,t} + \alpha_{18} COB\_OPT_{i,t} + \alpha_{19} CEO\_OPT_{i,t} + \alpha_{20} CFO\_OPT_{i,t} + \alpha_{21} TARGET_{i,t} + \alpha_{22} BATH_{i,t} + \alpha_{23} SMOOTH_{i,t} + \alpha_{24} \Delta COB_{i,t} + \alpha_{25} \Delta CEO_{i,t} + \alpha_{26} \Delta CFO_{i,t} + \alpha_{27} DEBT_{i,t} + \alpha_{28} lnSIZE\_MV_{i,t} + \varepsilon_{1i,t}$$

$$IMP\_AMOUNT_{i,t} = \beta_0 + \beta_1 \Delta GDP_{t,t-1} + \beta_2 \Delta UNEMPLOY\%_{t,t-1} + \beta_3 \Delta INDROA_{i,t,t-1} + \beta_4 \Delta INDRET_{i,t,t-1} + \beta_5 RET_{i,t} + \beta_6 \Delta SALES\%_{i,t,t-1} + \beta_7 \Delta ROA_{i,t,t-1} + \beta_8 \Delta OCF\%_{i,t,t-1} + \beta_9 BM_{i,t} + \beta_{10} DIFFBM_{i,t} + \beta_{11} HIST_{i,t} + \beta_{12} COB\_BON_{i,t} + \beta_{13} CEO\_BON_{i,t} + \beta_{14} CFO\_BON_{i,t} + \beta_{15} COB\_COSTOCK_{i,t} + \beta_{16} CEO\_COSTOCK_{i,t} + \beta_{17} CFO\_COSTOCK_{i,t} + \beta_{18} COB\_OPT_{i,t} + \beta_{19} CEO\_OPT_{i,t} + \beta_{20} CFO\_OPT_{i,t} + \beta_{21} TARGET_{i,t} + \beta_{22} BATH_{i,t} + \beta_{23} SMOOTH_{i,t} + \beta_{24} \Delta COB_{i,t} + \beta_{25} \Delta CEO_{i,t} + \beta_{26} \Delta CFO_{i,t} + \beta_{27} DEBT_{i,t} + \beta_{28} lnSIZE\_MV_{i,t} + \varepsilon_{2i,t}$$

where

$IMP\_DECISION_{i,t}$	=	Equals 1 if firm *i* reports goodwill-impairment losses for period *t*; otherwise 0.
$IMP\_AMOUNT_{i,t}$	=	Reported goodwill-impairment losses (a positive amount) of firm *i*, period *t*, scaled by total assets at time *t-1*.
$\Delta GDP_{t,t-1}$	=	Average-monthly changes in Gross Domestic Product of UK, from period *t-1* to *t*.
$\Delta UNEMPLOY\%_{t,t-1}$	=	Percentage average-monthly changes in unemployment rates of UK, from period *t-1* to *t*.
$\Delta INDROA_{i,t,t-1}$	=	Median changes in industry-sector pre-impairment return-on-assets from period *t-1* to *t* where industry sector is defined according to FTSE codes to which firm *i* belongs.
$\Delta INDRET_{i,t,t-1}$	=	Median changes in industry-sector stock returns from period *t-1* to *t* where industry sector is defined according to FTSE codes to which firm *i* belongs.
$RET_{i,t}$	=	Stock returns of firm *i*, period *t*.
$\Delta SALES\%_{i,t,t-1}$	=	Percentage changes in total sales of firm *i*, from period *t-1* to *t*.

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$\Delta ROA_{i,t,t-1}$	=	Changes in pre-impairment return-on-assets of firm *i*, from period *t-1* to *t*.
$\Delta OCF\%_{i,t,t-1}$	=	Percentage changes in operating cash flows of firm *i*, from period *t-1* to *t*.
$BM_{i,t}$	=	Pre-impairment book-to-market ratios of firm *i*, time *t*.
$DIFFBM_{i,t}$	=	Equals 1 if pre-impairment book equity of firm *i*, time *t*, is above market value of equity, time *t*; otherwise 0.
$HIST_{i,t}$	=	Equals 1 if goodwill-impairment losses are reported for firm *i*, period *t-1*; otherwise 0.
$COB\_BON_{i,t}$	=	Cash-bonus payments to COB of firm *i* period *t*, scaled by total cash compensation to COB period *t*.
$CEO\_BON_{i,t}$	=	Cash-bonus payments to CEO of firm *i* period *t*, scaled by total cash compensation to CEO period *t*.
$CFO\_BON_{i,t}$	=	Cash-bonus payments to CEO of firm *i* period *t*, scaled by total cash compensation to CFO period *t*.
$COB\_COSTOCK_{i,t}$	=	Number of conditional stocks held by COB of firm *i* time *t*, scaled by number of common stocks held by COB at time *t*.
$CEO\_COSTOCK_{i,t}$	=	Number of conditional stocks held by CEO of firm *i* time *t*, scaled by number of common stocks held by CEO at time *t*.
$CFO\_COSTOCK_{i,t}$	=	Number of conditional stocks held by CFO of firm i time *t*, scaled by number of common stocks held by CFO at time *t*.
$COB\_OPT_{i,t}$	=	Number of executive stock options held by COB of firm i time *t*, scaled by number of common stocks held by COB at time *t*.
$CEO\_OPT_{i,t}$	=	Number of executive stock options held by CEO of firm i time *t*, scaled by number of common stocks held by CEO at time *t*.
$CFO\_OPT_{i,t}$	=	Number of executive stock options held by CFO of firm i time *t*, scaled by number of common stocks held by CFO at time *t*.
$TARGET_{i,t}$	=	Equals to 1 if the pre-impairment earnings of firm *i*, period *t*, is above earnings for firm *i*, period *t-1*; otherwise 0.
$BATH_{i,t}$	=	Changes in pre-impairment earnings of firm *i* from period *t-1* to *t*, scaled by total assets at time *t-1*, when below the median of nonzero negative values of this variable; otherwise 0.
$SMOOTH_{i,t}$	=	Changes in pre-impairment earnings of firm *i* from period *t-1* to *t*, scaled by total assets at time *t-1*, when above the median of nonzero positive values of this variable; otherwise 0.
$\Delta COB_{i,t}$	=	Equals to 1 if firm *i* changes COB in period *t*; otherwise 0.
$\Delta CEO_{i,t}$	=	Equals to 1 if firm *i* changes CEO in period *t*; otherwise 0.
$\Delta CFO_{i,t}$	=	Equals to 1 if firm *i* changes CFO in period *t*; otherwise 0.
$DEBT_{i,t}$	=	Pre-impairment debt-to-equity ratio of firm *i*, time *t*.
$lnSIZE\_MV_{i,t}$	=	Natural logarithm of the equity-market value of firm *i*, time *t*.
$\varepsilon_{m,i,t}$	=	Residual of firm *i*, time *t* in regression *m* where $m \in [1,2]$.

The regression coefficients from the logit regression are interpreted to either increase (a positive coefficient) or decrease (a negative coefficient) the likelihood of reporting goodwill-impairment losses. The magnitude of the regression coefficients, however, is more complicated to interpret as the effect one explanatory variable has on the dependent variable (here: the impairment decision) varies with the values of the other explanatory variables. The effect one explanatory variable has on the binary dependent variable is conditional on the values at which the other explanatory variables are held constant. To investigate the impact one explanatory variable has on the binary dependent variable, marginal effects should be calculated, holding the other explanatory variables at fixed relevant values (Wooldridge 2009). The regression coefficients from the tobit regression can to a large extent be interpreted as ordinary-least-square coefficients (Gujarati 2003:618).

Two dependent variables are specified in the above regressions. A binary indicator variable which signifies whether the firm has reported an impairment loss in goodwill or not *(IMP_DECISION)* and a continuous, censored variable which equals the impairment-loss amount scaled by total assets at the beginning of the fiscal year *(IMP_AMOUNT)*. Scaling with total assets is consistent with scaling employed in previous studies employing a similar test design (e.g. Francis et al. 1996, Sellhorn 2004:226, Riedl 2004, Garrod, Kosi and Valentincic 2008). The first eleven (ten) [16] independent variables are supposed to reflect economic impairment in goodwill. Two issues must be considered when selecting and measuring the variables for economic impairment: the aggregation level at which the variables are selected, and the time period over which the variables are measured. Economic impairment is an event triggered by current-value reductions.

[16] It is debatable whether a sequence of impairment losses indicates economic impairment or earnings management.

In most cases current-value reductions are unobservable for researchers or at least difficult to estimate, which makes it necessary for pragmatic reasons to employ economic variables measured ex post as indicators of economic impairment. These variables are supposed to be highly positively correlated with the fair value of goodwill. Francis et al. (1996) argue and find support for an association between historical performance and impairment losses. They make use of performance variables measured over a period five years preceding the current impairment loss ending the year prior to the current impairment loss. This approach demands long time-series of data and will not be applied here. Instead, the variables will be measured over a period including the year prior to the current impairment loss and the year of the current impairment loss. This follows the approach conducted by Riedl (2004). Such a measurement procedure rests on the assumption that economic variables triggering the impairment will be present the year before and/or the same year as the impairment loss is reported.

The other issue to discuss is the aggregation level at which variables of economic impairment is selected. The eleven (ten) economic variables included in the above regressions are supposed to reflect economic conditions at three of four levels that may cause an impairment loss in goodwill: macro-economic level, industry-sector level, firm-specific level and asset-specific level (Francis et al. 1996, Riedl 2004). The economic value of goodwill is believed to be highly correlated with the overall firm value. For impairment-testing purposes, goodwill is disaggregated to cash-generating unit(s) or group(s) of cash-generating units. Still, goodwill is tested at an aggregate level compared to most other assets in the firm. This suggests that the economic factors affecting goodwill are to a large extent found at the macro-economic level, the industry-sector level and the firm level. This justifies leaving out variables at the asset-specific level.

In order to capture macro-economic effects, two variables are employed: changes in Gross Domestic Product of UK *(ΔGDP)* and percentage changes in unemployment rates of the UK *(ΔUNEMPLOY%)* (Loh and Tan 2002, Riedl 2004). Decreased Gross Domestic Product and increased unemployment rates are indicative of an overall macro-economic recession, suggesting that goodwill may suffer from economic impairment. This is based on the assumption that listed firms are mainly operating in the UK. Negative coefficients on changes in Gross Domestic Product *(ΔGDP)*, α_1 and β_1 , support hypotheses, 3a and 3b, that changes in Gross Domestic Product are negatively associated with impairment decisions *(IMP_DECISION)* and size of impairment losses *(IMP_AMOUNT)*. Likewise, positive coefficients on changes in unemployment rates *(ΔUNEMPLOY%)*, α_2 and β_2 , support hypotheses, 3c and 3d, that changes in unemployment rates are positively associated with impairment decisions *(IMP_DECISION)* and size of impairment losses *(IMP_AMOUNT)*. At the industry-sector level, the median changes in industry pre-impairment-return-on-assets *(ΔINDROA)* and the median changes in industry-stock returns *(ΔINDRET)* are supposed to capture industry-specific changes in the firms' underlying economics (Francis et al. 1996, Riedl 2004, Dai, Mao and Deng 2007). These industry variables are formed on firm-year observations in the sample. The industry-sector classification is based on the FTSE-code system and consists of 10 industry sectors. For a more careful discussion of the industry-sector classification, see section 7.1.1 below. Firms in financially declining industry sectors are believed to report more impairment losses relative to firms in expanding industry sectors. Negative coefficients, α_3 and β_3 , and α_4 and β_4 , support hypotheses, 3e and 3f, and 3g and 3h, that changes in industry-sector return-on-assets *(ΔINDROA)* and changes in industry-sector stock returns

(ΔINDRET) are negatively associated with impairment decisions *(IMP_DECISION)* and size of impairment losses *(IMP_AMOUNT)*.

Stock return *(RET)*, percentage changes in total sales *(ΔSALES%)*, changes in pre-impairment return-on-assets *(ΔROA)* and percentage changes in operating cash flows *(ΔOCF%)* are expected to reflect firm-specific changes in asset values. These variables are frequently used in prior studies (Francis et al. 1996, Loh and Tan (2002, Kvaal 2005, Dai et al. 2007, Jarva 2009). The inclusion of stock return is, however, controversial. Stock return is thought to be a comprehensive measure of the firm's underlying economics. Given semi-strong market efficiency and limited private information, the stock price will reflect economic impairment, which is later reported as impairment losses in the financial statement. Some evidence suggests that most of the information is reflected in stock prices prior to the impairment-loss announcement (Elliot and Shaw 1988, Chen et al. 2004). A complementary line of evidence suggests that impairment losses have information content as their announcements lead to significant changes in stock prices in narrow windows centered on the announcement day (Strong and Meyer 1987, Elliot and Shaw 1988, Francis et al. 1996, Li et al. 2005). These last findings contradict the notion that impairment losses are pre-emptied for all information before these losses are announced and/or recognised. Thus, stock returns may trigger recognition of impairment losses in the first place. At the same time, these impairment losses may hold some private information that affects stock prices and thereby stock returns. In the former case stock returns become an indicator of impairment losses whereas in the latter case impairment losses are used (or at least could be used) as input to determine the market value of the firm. Moreover, stock returns are employed elsewhere in this dissertation as a benchmark for testing value relevance and in particular value relevance of goodwill-impairment losses.

Allowing stock return to be included at both sides of the regressions seems logically inconsistent. Still, it could be argued that stock return should be included as an economic variable. The reason why is that stock return probably correlates with economic-value changes in goodwill. These changes represent an unobservable, latent variable. To the extent stock return is correlated with this latent variable, it should be included as an economic control variable.

The other firm-level variables measure firm performance in alternative ways. Percentage changes in total sales *(ΔSALES%)* and changes in pre-impairment return-on-assets *(ΔROA)* capture accounting-based performance, whereas percentage changes in operating cash flows *(ΔOCF)* capture cash-based performance. Changes in total sales represent gross performance or gross recoverability of total assets whereas changes in return-on-assets and changes in operating cash flows represent net measures of performance. Negative coefficients, α_5 and β_5 , α_6 and β_6 and α_7 and β_7 , and α_8 and β_8 , support hypotheses 3i to 3p that firm-level economic variables (*RET, ΔSALES%, ΔROA, ΔOCF%)* are negatively associated with impairment decisions *(IMP_DECISION)* and size of impairment losses *(IMP_AMOUNT)*. The last two economic variables are more closely related to the impairment-testing procedure. An indicator of goodwill impairment would be the cash-generating unit's book-to-market ratio. If this ratio is higher than one, the book value of the cash-generating unit can no longer be justified and an impairment loss must be reported (Sellhorn 2004, Ramanna and Watts 2008, Jarva 2009). Unfortunately, cash-generating units' market values are generally unobservable. However, as argued previously in this section, economic events affecting the value of the cash-generating units will probably affect the overall firm value as well, making it reasonable to employ the firms' pre-impairment book-to-market ratios as indicator of goodwill impairment.

Two variables are included: Book-to-market ratios *(BM)* and a variable taking the value one when book equity values are higher than equity-market values *(DIFFBM)*. The latter variable indicates whether the firms are in impairment positions or not. Positive coefficients, α_9 and β_9 , and α_{10} and β_{10} , support hypotheses 3q and 3r that pre-impairment book-to-market ratios *(BM, DIFFBM)* are positively associated with impairment decisions *(IMP_DECISION)* and size of impairment losses *(IMP_AMOUNT)*.

Previous years' impairment losses are associated with current year's impairment losses. Francis et al. (1996) include a variable signifying the number of years of impairment losses in a period of five years prior to the current fiscal year. They find that the history of impairment losses is a significant variable explaining current year's impairment losses. Elliot and Hanna (1996) investigate the information content of earnings when reporting successive impairment losses. They find that the information content of earnings is impaired for firms reporting impairment losses for several years. An indicator variable *(HIST)* is generated to investigate whether last year's impairment losses are associated with current year's impairment losses. This variable takes the value one if goodwill-impairment losses are reported last year and otherwise zero. Positive coefficients, α_{11} and β_{11}, support hypotheses 3s and 3t that last year's impairment losses in goodwill *(HIST)* are associated with impairment decisions *(IMP_DECISION)* and size of impairment losses *(IMP_AMOUNT)*.

The next seventeen variables are expected to reflect earnings-management incentives. They are intended to capture managers' incentives to overstate or understate goodwill-impairment losses. The first nine variables are supposed to reflect earnings-management incentives triggered by inefficient earnings-based and equity-based compensation contracts. The first of these concerns cash-bonus payments to COB, CEO and CFO *(COB_BON, CEO_BON, CFO_BON)*. In previous literature, cash-bonus payments have been indicated by a dummy variable which takes the value one if the firm pays cash bonus and otherwise zero (e.g. Beatty and Weber 2006, Ramanna and Watts 2009). These variables are not based on any details about the managers' remuneration. The cash-bonus variables employed here measure the relative portion of cash-bonus payments to total cash compensation. These variables are believed to be better at reflecting the relative importance of cash-bonus payments to other cash-based compensation.

Some studies have employed a lagged bonus-indicator variable (e.g. Beatty and Weber 2006) whereas others have employed a contemporaneous indicator variable (e.g. Ramanna and Watts 2009). The cash-bonus variables in the above regressions, however, are measured without time lag. This rests on the assumption that the decision to report impairment losses will be associated with current year's bonus payment. If managers are close to receiving a bonus payment or earnings are just above the target for bonus payment, they have incentives to increase current year's earnings by avoiding and/or understating goodwill-impairment losses. If earnings are far below the bonus target, however, managers may report impairment losses to increase the likelihood of meeting the bonus target in the future. This is consistent with big-bath accounting. Incentives to *take a bath* are expected to be captured by the big-bath variable *(BATH)* and the management-change variables *(ΔCOB, ΔCEO, ΔCFO)*. Any incremental association between the bonus-incentive variables and impairment losses are predicted to be negative. Negative coefficients, α_{12} and β_{12}, α_{13} and β_{13}, α_{14} and β_{14}, support hypotheses 3u and 3v that cash-bonus payments *(COB_BON, CEO_BON, CFO_BON)* are negatively associated with impairment decisions *(IMP_DECISION)* and size of impairment losses *(IMP_AMOUNT)*. For robustness reasons, changes rather than levels of cash-bonus payments are used as bonus-incentive variables. Changes in cash-bonus payments are supposed to reflect the extent to which the bonus target is reached the current fiscal year relative to the previous fiscal year. An increase in cash-bonus payments the current year suggests that net earnings[17] are higher relative to the threshold of bonus payment this year than the previous year. A decrease in cash-bonus payments the current year suggests the opposite that net earnings are lower relative to the threshold for cash-bonus payments this year than the previous year. Changes in cash-bonus payments are expected to be negatively associated with impairment decisions and size of impairment losses.

The next six variables are supposed to reflect equity-based incentives to avoid goodwill-impairment losses. Equity-based incentives might be triggered by equity-based compensation contracts such as executive-stock option plans and conditional-stock award plans. The awards are generally determined by market-based performance measures such as stock return. Both conditional stocks *(COB_COSTOCK, CEO_COSTOCK, CFO_COSTOCK)* and executive stock options *(COB_OPTION, CEO_OPTION, CFO_OPTION)* are included as explanatory variables in the above regressions. Conditional stocks are stocks that will vest if certain performance criteria are met within a specific time period. An ideal measure of incentives triggered by conditional stocks and stock options should reflect changes in managers' wealth in conditional stocks and stock options to a given change in stock price. For instance, the value of *in-the-money* stock options will be a valid indicator of managers' sensibility to reductions in stock price. When stock options are *in-the-money*, any reduction in stock price will directly result in a reduction of managers' wealth. However, such measures will

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[17] This is based on the premise that net earnings represent the target variable for bonus payments.

demand executive stock-option values. As no market exists for executive stock options, market values are not available. The same is the case for conditional stocks. Core and Guay (2001) and Burns and Kedia (2006) measure the sensitivity of one monetary-unit change in stock-option value relative to one percent change in stock price. They use the Black-Scholes option pricing model to obtain values on executive stock options. The use of this model is rather demanding because details are required on all the input variables needed in the model. The appropriateness of this model for estimating executive stock-option values is also debatable (e.g. Huddart and Lang 1996, Brown and Szimayer 2008, Leung and Sircar 2009). Incentives triggered by conditional stocks and executive stock options are instead measured as the managers' holdings of conditional stocks and stock options, scaled by the number of common stocks held by the managers, both measured at the end of the fiscal year. These variables are believed to reflect the importance of conditional stocks and stock options relative to common stocks held by the managers. Given that goodwill-impairment losses have the potential to negatively influence stock prices, it is expected that managers with substantial holdings of conditional stocks and stock options will avoid and/or understate goodwill-impairment losses. Negative coefficients, α_{15} to α_{20}, and β_{15} to β_{20}, support hypotheses 3w to 3z that conditional stocks *(COB_COSTOCK, CEO_COSTOCK, CFO_COSTOCK)* and stock options *(COB_OPTION, CEO_OPTION, CFO_OPTION)* are negatively associated with impairment decisions *(IMP_DECISION)* and size of impairment losses *(IMP_AMOUNT)*.

The next three variables are supposed to capture earnings-management incentives related to target accounting, big-bath accounting and income smoothing. The first of these three variables is trying to capture incentives to manage earnings to meet or beat earnings targets *(TARGET)*. Three different targets are generally investigated in the literature: last year's analysts' forecasts, last year's earnings and zero earnings (e.g. Degeorge at al. 1999). One target is considered here: last year's net earnings.[18] If pre-impairment earnings is above the target (last year's earnings), managers are expected to engage in earnings management that decrease earnings to a level equal to or just above the target. According to this, managers may report an impairment loss equal to or slightly less than the amount by which the pre-impairment earnings are above the target. If pre-impairment earnings fall short of the target, the managers may have incentives to report excessive impairment losses in order to increase the probability that earnings targets will be met in the future. This last case is consistent with big-bath accounting and discussed below. The target variable is dichotomous as it takes the value one if current year's pre-impairment earnings are above last year's earnings and otherwise zero. This suggests a positive association between the target variable, the impairment decision and size of impairment losses, respectively. Significantly positive coefficients, α_{21} and β_{21} , support hypotheses 3aa and 3ab that pre-impairment earnings above target *(TARGET)* are positively associated with impairment decisions *(IMP_DECISION)* and size of impairment losses *(IMP_AMOUNT)*.

The next two variables are supposed to capture incentives for big-bath accounting *(BATH)* and income smoothing *(SMOOTH)*. These reporting strategies are to some extent related to target accounting. Income smoothing can be used to smooth earnings towards a target, and if earnings fall well below target, this gives incentives for big-bath accounting. To distinguish income smoothing and big-bath accounting, separate variables are included to reflect incentives for each reporting strategy (e.g. Bartov 1993, Francis et al. 1996, Riedl 2004, Van de Poel et al.

[18] Although relevant, analysts' forecasts are not included because of lack of data.

2009). The *bathing* variable equals changes in pre-impairment earnings when these changes are below the median of nonzero negative values of changes in pre-impairment earnings and otherwise zero (Riedl 2004). Negative coefficients, α_{22} and β_{22}, support hypotheses 3ac and 3ad that negative earnings changes *(BATH)* are negatively associated with impairment decisions *(IMP_DECISION)* and size of impairment losses *(IMP_AMOUNT)*. The income-smoothing variable equals changes in pre-impairment earnings when these changes are above the median of nonzero positive values of changes in pre-impairment earnings and otherwise zero (Riedl 2004). Positive coefficients, α_{23} and β_{23}, support hypotheses 3ae and 3af that positive earnings changes *(SMOOTH)* are positively associated with impairment decisions *(IMP_DECISION)* and size of impairment losses *(IMP_AMOUNT)*.

The next three variables capture current year's changes in top management *(ΔCOB, ΔCEO, ΔCFO)*. The association between management changes and impairment losses may reflect economic impairment or earnings management. The above regression models are supposed to control and thereby discriminate between these alternative explanations. If changes in management are significantly positively associated with impairment losses after controlling for economic variables, this is interpreted as evidence that new managers are overstating impairment losses to increase future years' net earnings (Riedl 2004, Kvaal 2005). Management changes are measured by variables indicating current year's changes of Chairman of the Board (COB), current year's changes of Chief Executive Officer (CEO) and current year's changes of Chief Financial Officer (CFO). The variables take the value one if the manager is changed in the current fiscal year. This is based on the assumption that incoming managers (COB, CEO and CFO) appointed within the fiscal year are in a position to influence the final preparation of the financial statement, which involves impairment testing of goodwill. Positive coefficients, α_{24} and β_{24}, α_{25} and β_{25}, α_{26} and β_{26}, support hypotheses 3ag and 3ah that changes in management *(ΔCOB, ΔCEO, ΔCFO)* are positively associated with impairment decisions *(IMP_DECISION)* and size of impairment losses *(IMP_AMOUNT)*. A more careful investigation of management change should have disentangled forced from non-forced changes in management and internal from external changes in management. Kvaal (2010) demonstrates that impairment losses are not associated with non-forced CEO changes, but strongly associated with forced CEO changes. However, classifying management changes as either non-forced or forced is demanding and time consuming as the information needed for the classification must be collected by hand from business journals (e.g. Financial Times), annual reports or other public available sources.

The last two variables are supposed to reflect debt-covenant incentives *(DEBT)* and to some extent political-cost incentives *(lnSIZE_MV)*. The covenant details in debt contracts are generally not available for researchers. This necessitates the use of proxies that reflect incentives to avoid debt-covenant violations. The common variable used in the literature is debt-to-equity ratio. This variable is believed to be quite crude (Field et al. 2001, Dichev and Skinner 2001). However, there is no general consensus on the degree of misspecification using this variable as a measure of debt-covenant incentives. For instance, in the literature investigating earnings management in reported impairment losses, debt-equity ratios are frequently used as proxies for debt-covenant incentives (e.g. Sellhorn 2004, Kvaal 2005, Zang 2008, Ramanna and Watts 2009). Still, when employing this variable some assumptions are needed. First, it is necessary to assume that goodwill-impairment losses are not totally ignored when calculating the debt covenants. In general, the modifications done to GAAP when calculating these covenants are conservative implying that the modifications decrease rather than increase reported net earnings and net-asset values. Given the above reasoning, this suggests that goodwill-impairment losses are included rather than added back when calculating debt covenants. Second, the firm's expected cost of covenant violation is assumed to increase in its financial leverage. Following previous studies, the debt-covenant variable is set equal to the pre-impairment debt-to-equity ratios (Sellhorn 2004, Zang 2008, Ramanna and Watts 2009). A significantly negative sign on α_{27} and β_{27} supports hypotheses 3ai and 3aj that pre-impairment debt-to-equity ratios *(DEBT)* are positively associated with impairment decisions *(IMP_DECISION)* and size of impairment losses *(IMP_AMOUNT)*.

The last variable is generally included to reflect political-cost considerations. Given the discretion in impairment accounting, impairment losses might be used to decrease net earnings or dampen positive changes in net earnings. This makes high pre-impairment net earnings or positive pre-impairment net earnings changes obvious proxies for political-cost incentives. However, as high level of pre-impairment net earnings or positive pre-impairment net earnings changes most likely are strongly correlated with the income-smoothing proxy, political-cost incentives are rather indicated by firm size: natural logarithm of equity-market values. This variable is rather crude and will potentially reflect other latent variables than political-cost considerations. For instance, it might reflect the fact that large firms have more resources available for the preparation of their annual report and would be better equipped to discover impairment losses, which justifies a positive association between firm size and impairment losses. Another reason for a positive association, other than political-cost considerations, is that larger firms may have more diversified businesses than smaller firms. The probability that an economic impairment will hit one of these businesses is, therefore, higher for larger, more diversified firms than for smaller less, diversified firms. This suggests that associations between size, impairment decisions and size of reported impairment losses should be interpreted with caution. A significantly positive sign on α_{28} and β_{28} supports hypotheses 3ak and 3al that firm size *(lnSIZE_MV)* is positively associated with impairment decisions *(IMP_DECISION)* and size of impairment losses *(IMP_AMOUNT)*.

6.4. Model specification – abnormal-impairment losses, earnings management and corporate-governance mechanisms

The last research question concerns the associations between goodwill-impairment losses, earnings-management incentives and corporate-governance mechanisms. As earnings- management incentives are supposed to increase the likelihood of impairment losses being biased depictions of economic impairment, corporate-governance mechanism are supposed to have the opposite effect on the accounting of impairment losses. Efficient corporate-governance mechanisms are supposed to constrain opportunism and reduce the incidence of earnings management and thereby increase the representative faithfulness of accounting information (e.g. Weisbach 1988, Shleifer and Vishny 1997, Huson et al. 2001, Perry and Perry 2005, Perry and Shivdasani 2005). This suggests that managers of firms with stronger corporate-governance structures are more inclined to report impairment losses that better reflect economic impairment. In order to investigate the association between impairment losses and corporate-governance mechanisms a different set of regressions are employed than when investigating research question three. The dependent variable is not impairment losses per se, but a variable that reflects understated or overstated impairment losses. This variable will reflect the degree of misrepresentation in reported impairment losses. Corporate-governance mechanisms and earnings-management incentives are believed to be important when explaining the degree of misrepresentation. The choice of this test design must be clarified.

Corporate-governance mechanisms and impairment accounting might be investigated by several test designs. The most obvious design would be to use interaction terms consisting of corporate-governance variables, earnings-management incentive variables and/or economic variables. A similar design is used by Kallapur and Kwan (2004) to investigate how earnings management influences value relevance of capitalised brand assets. Corporate-governance variables would then be included as variables moderating the associations between earnings-management variables and impairment losses and/or the associations between economic variables and impairment losses. The general idea is to investigate whether firms with weak versus strong corporate-governance structures have more or less misrepresentation of impairment losses. There are two reasons why this design is not employed. First, including interactions of corporate-governance variables, earnings-management variables and/or economic variables in one single regression will lead to an excessive number of estimation parameters. For instance, a regression with all 12 corporate-governance variables interacting with all ten economic variables[19] will need to estimate 83 parameters (including the intercept) as all the interacting variables must be included as separate variables (12+10) along with the unique interactions of the corporate-governance variables and economic variables [(12*10)/2] (e.g. Aguinis 2004). It is, therefore, possible to investigate only one or a few corporate-governance variables simultaneously. Such a test design will provide limited evidence on how the total corporate-

[19] The variable indicating impairment losses the previous year *(HIST)* is not included.

governance structure affects impairment accounting. Second, interactions in nonlinear models such as the logit and tobit models are demanding to interpret. The sign, magnitude and significance of the interaction variables cannot be determined by the sign, magnitude and significance of the interaction coefficients (e.g. Ai and Norton 2003, Norton, Wang and Ai 2004, Hoetker 2007). The interaction effect might be positive for some observations, zero for others and negative for yet others. This implies that the hypotheses concerning the interaction effects may be rejected for some observations, but not for others.[20]

This calls for alternative test designs. The earnings-management literature in general (e.g. Dechow et al. 1995, Guay et al. 1996, Kothari et al. 2005) and the literature investigating the association between corporate-governance mechanisms and earnings management in particular (Dechow et al. 1996, Beasley 1996, Chtourou et al. 2001, Klein 2002, Koh 2003, Xie et al. 2003, Peasnell et al. 2005, Davidson et al. 2005, Mulgrew and Forker 2006, Ebrahim 2007, Koh et al. 2007) rely heavily on abnormal accruals as indicators of earnings management. The abnormal-accrual estimation models have been criticised for years for being too crude and/or aggregate to say anything about earnings management (e.g. Dechow et al. 1995, Guay et al. 1996, Beneish 1999, 2001, Field et al. 2001). The idea of estimating the component of accruals that might be managed or more generally, misrepresented, has still appeal among accounting researchers (e.g. Peasnell et al. 2005, Davidson et al. 2005, Mulgrew and Forker 2006, Ebrahim 2007, Koh et al. 2007, Jones et al. 2008). One important problem, however, lies in the estimation of the component being managed or the component being misrepresented. A

[20] Ai and Norton (2003) and Norton et al. (2004) have developed a STATA code called *inteff* for the interpretation of interaction effects in logit and probit models. This only works for one interaction effect at the time. The STATA code is available at: http://www.stata-journal.com/software/sj4-2/st0063/inteff.ado. At least to my knowledge, no command or STATA code is available for the interpretation of interaction effects in tobit regressions.

general procedure to estimate the component of accruals being managed is to regress total accruals on variables supposed to reflect unmanaged (i.e. normal or nondiscretionary) accruals and assume that the regression residuals reflect managed accruals (i.e. abnormal or discretionary). Previous studies employ both time-serial and cross-sectional estimation models (e.g. Kothari 2001). Measurement errors when estimating normal accruals might lead to abnormal accruals that comprise both managed and unmanaged accruals (e.g. McNichols 2000, Field et al. 2001, Beaver 2002).

Inspired by the previous accrual-based literature and by recent extensions made by Lapointe-Antunes et al. (2008) and Zang (2008), an estimate of abnormal-impairment losses is employed to indicate the extent to which goodwill-impairment losses reflect economic impairment. In contrast to most earnings-management literature, this measure is for a specific accrual, impairment losses, which is consistent with the recommendations of Healy and Wahlen (1999), McNichols (2000) and Field et al. (2001). They argue that future progress in the earnings-management literature will require a departure from extensive reliance on aggregate-accrual models. Moreover, it is probably easier to obtain a valid estimate of the degree of misrepresentation in goodwill-impairment losses than aggregate accounting numbers such as net earnings. Economic impairment represents current-value reductions. These losses are, therefore, expected to be strongly correlated with economic variables reflecting deteriorated economic performance at the macro-economic level, the industry-sector level and the firm-specific level. Some problems of measurement errors may still occur. First, current-value reductions in goodwill are not directly observable. There are no observable market values for goodwill and it is generally impossible to estimate a current value for goodwill. Second, economic impairment in goodwill may occur at lower levels than the firm level. Still, it is argued that economic goodwill to a larger extent than other assets is related to overall firm performance (e.g. Francis et al. 1996, Riedl 2004). This justifies leaving out economic variables at the asset-specific level.

All economic variables included in regression 6.8 above are employed to estimate the normal or expected goodwill impairment. The only exception is the indicator variable *(HIST)* for last year's impairment losses. This variable may reflect earnings-management incentives for understating and/or delaying impairment losses rather than economic impairment. Estimates of normal or expected impairment losses are obtained by running a regression of reported impairment losses on economic variables. Fitted values from this regression become the estimates of normal or expected impairment. Differences between reported impairment losses and estimated impairment losses give abnormal-impairment losses. These serve as estimates of the degree of misrepresentation in reported impairment losses. The regression used to estimate normal or expected impairment losses is specified in table 6.9 below:

Table 6.9 Regression model – abnormal-impairment losses

$$IMP\_AMOUNT_{i,t} = \alpha_0 + \alpha_{1-10}(ECONOMIC\ VARIABLES\ FOR\ IMPAIRMENT)_{i,t} + u_{i,t}$$

ECONOMIC VARIABLES FOR IMPAIRMENT are all specified in table 6.8.

$u_{i,t}$ = Residual of firm *i*, time *t*. Estimate of abnormal-impairment losses in goodwill.

Residuals from this ordinary-least square regression[21] serve as estimates of abnormal or unexpected impairment losses. This is the component of reported

[21] An ordinary-least square regression is run instead of a tobit regression as the residuals in tobit regressions are not well defined (Lapointe-Antunes et al. 2008).

impairment losses that is not explained by economic variables. Abnormal-impairment losses are positive if reported impairment losses are higher than expected impairment losses. This suggests that reported impairment losses are overstated. If abnormal-impairment losses are negative, reported impairment losses are lower than expected impairment losses, which suggests that reported losses are understated. And finally, if abnormal-impairment losses equal zero, it suggests that reported losses are unbiased. Expected impairment losses are censored at zero if the predicted values of impairment losses are negative. Negative values for expected impairment losses indicate positive revaluations of goodwill which are not permitted under current IFRS. To be consistent with GAAP, these negative expected impairment losses are set equal to zero. This means that the related reported losses are considered as overstated impairment losses. Given that the economic variables are capable of reflecting the economic impairment in goodwill, differences between reported impairment losses and expected impairment losses can be interpreted as unintended and intended measurement errors. Intended measurement errors, not explained by accounting regulation, will most likely be the result of earnings management.

Earnings-management incentives are predicted to be associated with both understated and overstated impairment losses (see hypotheses 4a to 4r). As corporate-governance mechanisms are believed to constrain earnings management, it is reasonable to expect that the absolute value of abnormal losses will decrease with corporate governance. Positive associations are, therefore, predicted between corporate-governance mechanisms and understated impairment losses (negative abnormal-impairment losses) and negative associations are predicted between these mechanisms and overstated impairment losses (positive abnormal-impairment losses). Separate regressions are run for understated impairment losses (Negative abnormal-impairment losses) and overstated impairment losses (Positive abnormal-impairment losses). Understated impairment losses are right censored at zero whereas overstated impairment losses are left censored at zero. The independent variables, however, are continuous, discrete or binary. This suggests a tobit regression model rather than an ordinary-least-square regression model. The following tobit regressions are run for understated and overstated impairment losses in order to test hypotheses 4a to 4al:

Table 6.10 Regression model to test hypotheses 4a to 4al

$$AB\_IMP\_NEG_{i,t} = \alpha_0 + \alpha_{1-17}(EARNINGS-MANAGEMENT INCENTIVES\ VARIABLES)_{i,t} + \alpha_{18} lnBOARD\_SIZE_{i,t} + \alpha_{19} NONEXE_{i,t} + +\alpha_{20} lnBOARD\_MEET_{i,t} + \alpha_{21} COB\_STOCK_{i,t} + \alpha_{22} CEO\_STOCK_{i,t} + \alpha_{23} CFO\_STOCK_{i,t} + \alpha_{24} ACCEXP_{i,t} + \alpha_{25} lnAUDIT\_MEET_{i,t} + \alpha_{26} lnAUDIT\_SIZE_{i,t} + \alpha_{27} BLOCK_{i,t} + \alpha_{28} lnBLOCK\_NUM_{i,t} + \alpha_{29} CROSS_{i,t} + \varepsilon_{1i,t}$$

$$AB\_IMP\_POS_{i,t} = \beta_0 + \beta_{1-17}(EARNINGS-MANAGEMENT INCENTIVES\ VARIABLES)_{i,t} + \beta_{18} lnBOARD\_SIZE_{i,t} + \beta_{19} NONEXE_{i,t} + +\beta_{20} lnBOARD\_MEET_{i,t} + \beta_{21} COB\_STOCK_{i,t} + \beta_{22} CEO\_STOCK_{i,t} + \beta_{23} CFO\_STOCK_{i,t} + \beta_{24} ACCEXP_{i,t} + \beta_{25} lnAUDIT\_MEET_{i,t} + \beta_{26} lnAUDIT\_SIZE_{i,t} + \beta_{27} BLOCK_{i,t} + \beta_{28} lnBLOCK\_NUM_{i,t} + \beta_{29} CROSS_{i,t} + \varepsilon_{2i,t}$$

VARIABLES FOR EARNINGS-MANAGEMENT INCENTIVES are all specified in table 6.8.

$AB\_IMP\_NEG_{i,t}$	=	Equals negative differences between reported impairment losses period *t* scaled by total assets at time *t-1* and estimated normal (expected) impairment losses of firm *i* period *t* (see table 6.9 above). If the estimated normal (expected) impairment losses are negative, they are censored at zero.
$AB\_IMP\_POS_{i,t}$	=	Equals positive differences between reported impairment losses period *t* scaled by total assets at time *t-1* and estimated normal (expected) impairment losses of firm *i* period *t* (see table 6.9 above). If the estimated normal (expected) impairment losses are negative, they are censored at zero.
$lnBOARD\_SIZE_{i,t}$	=	Natural logarithm of number of board members of firm *i* time *t*.
$NONEXE_{i,t}$	=	Number of independent non-executive directors, scaled by total number of board members of firm *i* time *t*.
$lnBOARD\_MEET_{i,t}$	=	Natural logarithm of number of board meetings of firm *i* time *t*.

Table continues on next page.

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$COB\_STOCK_{i,t}$	=	Number of common stocks held by COB of firm *i* time *t*, scaled by total number of outstanding common stocks at time *t*.
$CEO\_STOCK_{i,t}$	=	Number of common stocks held by CEO of firm *i* time *t*, scaled by total number of outstanding common stocks at time *t*.
$CFO\_STOCK_{i,t}$	=	Number of common stocks held by CFO of firm *i* time *t*, scaled by total number of outstanding common stocks at time *t*.
$ACCEXP_{i,t}$	=	Equals to 1 if firm *i* time *t* has at least one audit-committee member being financial-accounting expert; otherwise 0.
$lnAUDIT\_SIZE_{i,t}$	=	Natural logarithm of number of audit-committee members of firm *i* time *t*.
$lnAUDIT\_MEET_{i,t}$	=	Natural logarithm of number of audit-committee meetings of firm *i* time *t*.
$BLOCK\%_{i,t}$	=	Cumulative percentage of outstanding common stocks held by blockholders owning at least 5% of outstanding common stocks of firm *i* time *t*.
$lnBLOCK\_NUM_{i,t}$	=	Natural logarithm of number of blockholders owning at least 5% of outstanding common stocks of firm *i* time *t*.
$CROSS_{i,t}$	=	Equals to 1 if firm *i* is cross-listed on the New York Stock Exchange or the NASDAQ Stock Exchange time *t*; otherwise 0.
$\varepsilon_{m,i,t}$	=	Residual of firm *i*, time *t* in regression *m* where $m \in [1,2]$.

All earnings-management and corporate-governance variables are included as explanatory variables of understated impairment losses (negative abnormal-impairment losses) or overstated impairment losses (positive abnormal-impairment losses). Higher values on corporate-governance variables are indicative of stronger corporate governance. The associations between these variables and understated impairment losses (take negative values) are predicted to be positive. In contrast, the associations between these variables and overstated impairment losses (take positive values) are predicted to be negative (see hypotheses 4s to 4al).

The earnings-management incentives, however, are supposed to lead to understated or overstated impairment losses (see hypotheses 4a to 4r). Elements of the remuneration package such as cash-bonus payments *(COB_BON, CEO_BON, CFO_BON)*, conditional stocks *(COB_COSTOCK, CEO_COSTOCK,* *CFO_COSTOCK)* and stock options *(COB_OPTION, CEO_OPTION, CFO_OPTION)* are all predicted to be associated with fewer and smaller impairment losses, which suggests that these variables should be negatively associated with understated *(AB_IMP_NEG)* and overstated impairment losses *(AB_IMP_POS)* (hypotheses 4a to 4f). Similarly, debt-covenant incentives indicated by debt-to-equity ratios *(DEBT)* are predicted to be associated with fewer and smaller impairment losses, which suggests that this variable is negatively associated with understated *(AB_IMP_NEG)* and overstated impairment losses *(AB_IMP_POS)* (see hypotheses 4o and 4p). Some incentives are expected to lead to more and larger impairment losses. These are incentives for big-bath accounting *(BATH)*, income smoothing *(SMOOTH)*, target accounting *(TARGET)*, management change *(ΔCOB, ΔCEO, ΔCFO)* and firm size *(lnSIZE_MV)*. The big-bath accounting variable takes negative values, which suggests a negative association between this variable and understated *(AB_IMP_NEG)* and overstated impairment losses *(AB_IMP_POS)*. Income smoothing *(SMOOTH)*, target accounting *(TARGET)*, management change *(ΔCOB, ΔCEO, ΔCFO)* and firm size *(lnSIZE_MV)* are all predicted to be positively associated with understated *(AB_IMP_NEG)* and overstated impairment losses *(AB_IMP_POS)* (see hypotheses 4k to 4n and 4q and 4r).

The chosen specifications of corporate-governance variables can all be justified with reference to prior literature. Board size *(lnBOARD_SIZE)* is generally measured as the number of directors at the end of the fiscal year (Dechow et al. 1996, Chtourou and Bedard 2001, Xie et al. 2003, Dey 2008, Krishnan and Lee 2009), and board activity *(lnBOARD_MEET)* as the number of board meetings during the fiscal year (Xie et al. 2003, Dey 2008). Board independence is in some cases measured as the ratio of non-executive directors to total board members (e.g.

Beasley 1996, Dechow et al. 1996). Recent studies, however, recognise the important distinction between independent directors and affiliated directors (e.g. Chtourou et al. 2001, Klein 2002, Vafeas 2003, Xie et al. 2003, Mulgrew and Forker 2006). In this study board independence *(NONEXE)* is measured as the ratio of *independent* non-executive directors to total directors, which is consistent with recent recommendations (e.g. Krishnan and Lee 2009). Managerial stockholdings *(COB_STOCK, CEO_STOCK, CFO_STOCK)* are measured as the ratio of common stockholdings held by COB, CEO and CFO respectively, to outstanding common stocks, which is consistent with prior literature (Beasley 1996, Core et al. 1999, Chtourou and Bedard 2001, Goyal and Park 2002, Vafeas 2003, Xie et al. 2003, Krishnan and Lee 2009).

Three variables are chosen to reflect audit-committee characteristics: Audit-committee expertise, audit-committee size and audit-committee activity. Conventional measures are used. Audit-committee expertise *(ACCEXP)* is measured as a dummy variable which takes the value one if the firm has at least one audit-committee member being financial-accounting expert (Chtourou and Bedard 2001, Dey 2008, Krishnan and Lee 2009). A narrow definition is employed here. In order to qualify as a financial-accounting expert the director must be a chartered accountant, which is consistent with recommendations made by Krishnan and Lee (2009). Audit-committee size *(lnAUDIT_SIZE)* is the number of audit-committee members (Xie et al. 2003, Kent et al. 2008, Krishnan and Lee 2009), and audit-committee activity *(lnAUDIT_MEET)* is measured as number of audit-committee meetings (Chtourou and Bedard 2001, Xie et al. 2003, Kent et al. 2008, Dey 2008). The two next variables are reflecting cumulative blockholdings *(BLOCK%)* and number of blockholders *(lnBLOCK_NUM)*. Both variables are employed in previous literature (Beasley 1996, Core et al. 1999, Chtourou and Bedard 2001, Goyal and Park 2002, Vafeas 2003, Xie et al 2003, Krishnan and Lee 2009). And finally, cross-listing is indicated by a dummy variable taking the value one if the firm is cross-listed on the New York Stock Exchange or NASDAQ Stock Exchange (e.g. Lang et al. 2003, Bailey et al. 2006).

7. Empirical analysis

This chapter is structured into three subchapters. The first subchapter presents the sample-selection process and the sample characteristics. The second subchapter discusses evidence on research question one and two, whereas the last subchapter discusses evidence on research question three and four.

7.1. Sample selection

Listed firms included in the FTSE-350 index at the London Stock Exchange are chosen as sample frame for this study. These firms are the 350 largest firms ranked by market value and are probably among the firms which have the highest stock liquidity, the smallest bid-ask spreads and the most analysts' followings on the London Stock Exchange. This suggests more informational efficient stock prices (Bhushan 1994, Kothari 2001, Fung et al. 2010). Firm-year observations are collected for the fiscal years 2004-2009. The chosen time period includes one year of non-IFRS observations (2004) and five years of IFRS observations (2005-2009). The latter period represents the core investigation period. The inclusion of 2004 observations serves two purposes. First, some regression variables need observations for two subsequent years, which necessitates the inclusion of 2004 firm observations. Second and more specifically, 2004 annual reports give access to information about the chosen amortisation period for goodwill prior to IFRS adoption.

Three data sources are employed to collect firm-year observations. The initial data source is Thomson Datastream. This database provides information necessary for the sample selection such as firm name, calendar year, industry classification, applied accounting principles and whether the firm has book goodwill on its balance sheet. The database also provides stock-market data. The second source is the firms' annual reports. All accounting data, remuneration data and corporate-governance data are hand collected from the firms' annual reports. The reports are either down-loaded from Northcote annual-report service[22] or from the firms' investor-information websites. Missing annual reports are requested on mail. Accounting data are hand collected from financial statements. Data for remuneration and corporate-governance variables are hand collected from three distinctive supplementary reports, generally included as part of the annual report. These are the director's report, the remuneration report and the corporate-governance report. The third and last of these three data sources is the UK-National Statistics[23], which provides data on the macro-economic variables.

In order to reach to the final sample of firm-year observations, some additional selection criteria are employed. The first selection criterion concerns book goodwill. The objective of this dissertation is to investigate the decision usefulness of goodwill-accounting numbers. Firm-year observations with no book goodwill in any of the years 2004-2009 are, therefore, excluded from the final sample. The second criterion concerns firms classified as banks or insurance companies. These firms have generally been excluded from samples in previous studies unless these firms have been of particular interest for the research question (e.g. Jennings et al. 1996a, Huigjen 1996, Francis et al. 1996, Bunis 1997, Ibrahim 1999, Petersen 2001, 2002, Riedl 2004, Kvaal 2005). The same is the case for firms in the petroleum industry (e.g. Bunis 1997, Kvaal 2005). A general argument is that these firms have substantially different annual reports because of industry-specific accounting regulation. Another argument is that these firms have operations which

[22] See http://www.northcote.co.uk/.

[23] See http://www.statistics.gov.uk/hub/economy/index.html.

substantially differ from other firms. None of these arguments are valid for the exclusion of petroleum firms. These firms must prepare annual reports that comply with IFRS. Moreover, their operations do not seem to differ substantially from other firms, for instance, firms in mining and steel production. Banks and insurance companies, however, are excluded. These firms do have operations that differ substantially from most other firms. Even though listed banks and insurance companies must prepare annual reports that comply with IFRS, their odd nature combined with industry-specific regulations make annual reports of these firms less comparable to annual reports of other firms. These firms are, therefore, excluded from the final sample. It should be remarked that firms within real estate (FTSE code 86), financial services (FTSE code 87) and investment instruments (FTSE code 89) are included in the final sample.[24]

The third criterion concerns accounting regime. Firms preparing annual reports under different GAAP than IFRS for years other than 2004 are excluded. The fourth criterion concerns early voluntary adopters. Firms adopting IFRS prior to the fiscal year 2005 are classified as early IFRS adopters. These firms will probably have stronger motivation for IFRS implementation than firms forced to adopt IFRS. Consistent with this notion, the literature demonstrates that voluntary IFRS adopters prepare annual reports with higher accounting quality than mandatory adopters (Daske, Hail, Leuz and Verdi 2007). Some of these voluntary adopters may adopt IFRS as part of a broader strategy that increases their commitment to transparency, for instance, they may hire higher quality auditors, improve corporate governance or seek cross-listing in stricter regimes along with IFRS adoption (Ball 2006, Daske et al. 2007). Voluntary adopters should either be controlled for in the empirical analysis or excluded from the final sample. The last

[24] These codes are the new FTSE codes from 1st of January 2006.

alternative is chosen here. The fifth criterion concerns access to annual reports. Firms included in the final sample must have available annual reports or available financial statements for one of the years 2004-2009. Firms without available annual reports or financial statements are generally delisted or merged with another listed or unlisted firm during the years 2004-2009. A few firms do not have available annual reports or financial statements, but available annual reviews. These firms are excluded as these annual reviews generally provide insufficient data for the accounting variables. In contrast to some previous studies, firms reporting in foreign currency (currency other than British Pounds £) are included in the final sample. Likewise, firms with a fiscal year that differs from the calendar year are also included. 158 out of 1293 firm-year observations have accounting numbers in different currencies than British Pounds (£), most of these in US Dollars ($) (149 firm years). Accounting numbers in different currencies are converted to British Pounds (£) at the end of the fiscal years.[25] Firms with fiscal years other than calendar years are quite common. Close to half of the sample firms report financial statements over periods that differ from the calendar year (49.65%). Most firms end fiscal years on the 31st of March or on the 30th of June. Fiscal-year ends, however, are not limited to these two dates and months. Fiscal-year end dates are in fact found in all twelve months. Excluding firms with fiscal years that differ from calendar years would have serious effects on the final sample. To prevent selection bias, these firms are included. This makes the data collection more demanding. All variables not reported in the annual reports must be measured according to the fiscal year. Stock prices at the end of the fiscal years, for instance, will not necessarily be stock prices at the end of the calendar

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[25] The currency rates are collected from Oanda-Forex Trading and Exchange-Rates Service. See http://www.oanda.com/currency/converter/.

years. Similarly, changes in Gross Domestic Product *(ΔGDP)* and percentage changes in unemployment rates *(ΔUNEMPLOY%)* must be calculated over fiscal years rather than calendar years. To range the firm-year observations by year, annual reports which end earlier than 1^{st} of July are assigned to the previous calendar year, while annual reports which end later than 30^{th} of June are assigned to the current calendar year.

The results of the sample-selection process are given in table 7.1. Panel A reports the effect of the sample-selection process on firm-year observations, whereas panel B reports the effect of this process on the number of unique sample firms. A firm-year observation is excluded if the observation fails to meet one of the above criteria. If the firm-year observation fails to meet several criteria, the excluded firm-year is only counted once. Not meeting several criteria, however, is quite common. 233 firm-year observations (26.91% of total excluded firm years) failed on one criterion, 482 firm-years (55.66%) on two criteria, 124 firm-years (14.32%) on three criteria, and finally, 27 firm-years (3.12%) failed on four criteria.

Table 7.1 Sample selection

Panel A – Firm-year observations

	2004	2005	2006	2007	2008	2009	2004-2009	
	N	N	N	N	N	N	N	%
Firm-years for FTSE-350 firms available on Thomson Datastream	359	356	357	361	369	357	2159	100.00
Book goodwill								
Firm years with no book goodwill	86	81	74	67	76	79	463	21.45
Firm years with no available information on book goodwill	10	9	7	11	20	19	76	3.53
Excluded firm-years with no goodwill or no available information	96	90	81	78	96	98	539	24.97
Banks and insurance companies								
Firm years for banks	8	8	8	0	0	0	24	1.11
Firm years for insurance companies	12	13	13	8	6	5	57	2.64
Excluded firm years for firms classified as banks and insurance companies	20	21	21	8	6	5	81	3.75
Different accounting regimes than IFRS								
Firm years with different accounting regimes than IFRS (2005 – 2009)	0	0	1	3	4	3	11	0.51
Excluded firm years for firms following different accounting regimes	0	0	1	3	4	3	11	0.51
Early voluntary-IFRS adopters								
Excluded firm years for firms which have voluntarily adopted IFRS early	2	0	0	0	0	0	2	0.09
Annual reports missing								
Excluded firm years due to missing annual reports or financial statements	70	47	32	33	21	30	233	10.79
Total firm years excluded							866	40.11
Sample of firm-year observations	171	198	222	239	242	221	1293	59.89
Panel B – Unique firms								
FTSE-350 firms available on Thomson Datastream (2004 –2009)							522	100
Excluded firms							234	44.83
Total sample of firms							288	55.17

A total of 2159 FTSE-350 firm-year observations are available on Thomson Datastream for the period 2004-2009. 463 firm-year observations have no book goodwill on the balance sheet and for additional 76 firm-year observations no information is available on book goodwill. These firm-year observations are all excluded. Firms are also excluded if they are classified as banks or insurance companies. This criterion reduces the sample with 81 firm years. The next two criteria concerns firms reporting under different GAAP than IFRS in the fiscal years 2005-2009 and early voluntary-IFRS adopters. 13 firm-year observations are excluded due to these two criteria. And finally, firms that do not have available annual reports or financial statements reduce the sample with additional 233 firm years. This leaves the final sample at 1293 firm-year observations. The IFRS-period, 2005-2009, has 1122 firm years. The number of unique firms has fallen from an initial sample frame of 522 firms for the period 2004-2009 to 288 firms in the final sample.

7.1.1.Book goodwill and goodwill-impairment losses

Descriptive statistics on book goodwill and goodwill-impairment losses are reported in table 7.2. Panel A provides descriptive statistics on the size of book goodwill and goodwill-impairment losses. It also gives information on the frequency of goodwill-impairment losses across industry sectors. Panel B provides the number of goodwill-impairment losses across fiscal years, and finally, panel C provides the number of goodwill-impairment losses per firm. 10 industry sectors are formed based on FTSE Global Classification System. The industry codes included in each industry sector are given in panel A.

Table 7.2 Descriptive statistics – book goodwill and goodwill-impairment losses

Panel A – Book goodwill and goodwill-impairment losses – by industry sectors

	Industry sector		*Book goodwill*		*Goodwill-impairment losses*		
			Goodwill to total assets%		*Goodwill-impairment losses to pre-impairment net earnings%*		*% of obs.*
	FTSE code	*N*	*Mean*	*Median*	*Mean*	*Median*	
Resources	4, 5, 7, 17	88	6.01	4.22	4.27	0	37.50
Basic industries	11, 13, 15, 18	57	12.78	12.38	1.26	0	17.54
General industrials	21, 23, 25, 26, 27	401	38.71	19.63	-1.97	0	15.46
Cyclical-consumer goods	31, 34, 37	13	8.48	7.44	6.44	1.32	61.54
Non-cyclical consumer goods	35, 41, 44, 45, 47, 48, 49	103	19.77	17.82	4.13	0	22.33
Cyclical services	52, 53, 54, 55, 57, 58, 59	365	25.88	17.76	38.51	0	23.84
Non-cyclical services	63, 67	11	13.40	5.04	125.80	0	18.18
Utilities	65, 72, 75, 77	66	8.08	5.04	3.63	0	18.18
Information technology	93, 95, 97	53	36.69	33.20	9.55	0	7.55
Finance	86, 87, 89	136	7.87	1.96	4.31	0	26.47
Total		1293					

Panel B – Number of goodwill-impairment losses by fiscal years

Year	***2004***	***2005***	***2006***	***2007***	***2008***	***2009***	***Total***
Number of goodwill-impairment losses	33	47	49	31	71	48	279

Panel C – Number of goodwill-impairment losses reported per firm

Goodwill-impairment losses per firm	***0***	***1***	***2***	***3***	***4***	***5***	***6***
Number of firms	146	66	38	16	9	8	4

The industry sector *resources* comprises firms in mining, oil and gas; *basic industries* comprises firms in chemicals, construction and building materials, forestry and steel and other metals; *general industrials* comprises firms in aerospace and defense, electronic and electrical equipment and engineering and machinery; *cyclical-consumer goods* comprises firms in automobiles and parts and household goods and textiles; *non-cyclical consumer goods* comprises firms in beverages, food producers and processors, health, personal care and household products, pharmaceuticals and biotechnology and tobacco; *cyclical services* comprises firms in general retailers, leisure and hotels, media and entertainment, support services and transport; *non-cyclical services* comprises firms in foods and drug retailers and telecommunication services; *Utilities* comprises firms in electricity and other utilities; *information technology* comprises firms in information-technology hardware and software and computer services; *finance* comprises firms in investment and finance sector other than banks and insurance companies. Goodwill-impairment losses take positive values.

Firms in general industrials, information technology and cyclical services are those with the largest book goodwill relative to total assets. Book goodwill constitutes more then one third of total assets for the average firm in general industrials (Mean: 38.71%) and information technology (Mean: 36.69%). Goodwill is, therefore, a material asset in some industry sectors. In other industry sectors, however, goodwill is less significant. This is particularly the case in the industry sectors: resources (Mean: 6.01%) and finance (Mean: 7.87%).

Firms in cyclical services are among those reporting the largest impairment losses relative to pre-impairment net earnings. Firms in this sector have average impairment losses which constitute 38.51% of pre-impairment net earnings. When it comes to the frequency of impairment losses, the firms within the industry sectors cyclical-consumer goods (61.54%), resources (37.50%) and finance (26.47%) are those with the highest frequency of impairment losses. This suggests that the size of book goodwill and the size and frequency of goodwill-impairment losses are industry specific. Book goodwill represents a significant asset in some industry sectors, but not in others, and goodwill-impairment losses are relatively larger and less frequent in some industry sectors, e.g. information technology, and smaller and more frequent in others, e.g. cyclical-consumer goods and resources. The number of impairment losses is rather constant each year. The 2008 fiscal year, however, is an exception. This year is extraordinary due to the financial recession. Most sample firms report no goodwill-impairment losses in the years 2004-2009 (62.39%). Among those that do, one or two losses are most common. Still, there are four firms reporting impairment losses in all years 2004-2009, which suggests that impairment losses might be understated in some firms.

7.2. Empirical analysis of research question 1 and 2

This subchapter investigates value relevance of goodwill reported under the impairment-only method (current IFRS), the amortisation-only method and the combined amortisation-and-impairment method. Research question one concerns value relevance of goodwill numbers reported under the impairment-only method (current IFRS). Hypotheses 1a to 1c are tested in order to answer research question one. Research question two concerns value relevance of goodwill numbers reported under the impairment-only method compared to value relevance of goodwill numbers reported under alternative methods. Hypotheses 2a to 2f are tested in order to answer research question two.

7.2.1.Calculation of the as-if accounting numbers

Hypotheses 2a to 2f concerns value relevance of goodwill numbers reported under the amortisation-only method and the combined amortisation-and-impairment method. In order to test these hypotheses, accounting numbers must be adjusted as if they are reported under these methods. Complete adjustments are only possible if annual reports (or financial statements) for firms with book goodwill are available for all the fiscal years back to the pre-IFRS adoption year 2004. A subsample of firms that meet this requirement will make it possible to undo all changes in book goodwill that have occurred under the impairment-only method. The 2004 annual reports will also provide information on the chosen amortisation period for goodwill. 762 firm-year observations meet this additional criterion.

A careful explanation of the adjustment procedure is needed. The first step is to undo effects of impairment-only method in net earnings, book goodwill and book equity. Current year's impairment losses must be added back in net earnings. Goodwill and equity are included in the value-relevance regressions with their book values at the beginning of the fiscal years. This implies that current year's impairment losses should not be added back in these book values. Previous years' impairment losses, however, must be added back in order to reach a non-impairment method position. Only impairment losses reported under IFRS are added back, not impairment losses reported prior to IFRS adoption. When all effects of impairment losses are undone, accounting numbers will be in line with an accounting method with no recognition of amortisation charges and impairment losses: the permanent-retention method.

Amortisation charges are calculated as a percentage[26] of the goodwill-cost price at fiscal-year end. When calculating the numbers under the amortisation-only method, the goodwill-cost price will be the cost price at the time of IFRS adoption adjusted for all subsequent net changes in book goodwill other than reported impairment losses. The amortisation periods used to calculate as-if accounting numbers are identical to those used by the firms prior to IFRS adoption. Some firms, however, do not report the exact amortisation period. They simply state that the maximum amortisation period is 20 years under UK-GAAP.[27] For these firms, the amortisation periods are set equal to 20 years. This choice can be justified. Most sample firms use an amortisation period of 20 years (57.93%). Besides, Jennings et al. (2001) demonstrate that UK-listed firms generally amortise goodwill over periods of 20 years.

Calculated amortisation charges are deducted from pre-impairment net earnings. Accumulated amortisation charges from the time of IFRS adoption to the fiscal year are deducted from pre-impairment book equity and pre-impairment book goodwill. This gives net earnings, book goodwill and book equity under the amortisation-only method. It is more demanding, however, to adjust accounting numbers to a combined amortisation-and-impairment method. Under this method, both as-if accounted amortisation charges and as-if accounted impairment losses

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[26] Given linear amortisation, the percentage equals *(1/n)*100* where *n* is the economic lifetime in number of years.

[27] UK-GAAP has a presumption that goodwill shall not be amortised over more than 20 years (ASB 1997).

must be calculated. Impairment losses reported under current IFRS will only be reported under the combined amortisation-and-impairment method if they are not already covered by current year's and previous years' amortisation charges. If accumulated as-accounted impairment losses are larger than accumulated as-if accounted amortisation charges, differences between these two accumulated amounts should be reported as impairment losses under the combined amortisation-and-impairment method. To make the adjustments complete, these losses are allowed to affect subsequent amortisation charges and impairment losses by deducting these impairment losses from the goodwill-cost price.

7.2.2.Descriptive statistics and bivariate correlation

This section discusses descriptive statistics and bivariate correlation of variables employed in price-book-earnings regressions and return-earnings regressions. Table 7.3 below gives the descriptive statistics. The statistics are for deflated versions of the variables. Price-book-earnings variables are deflated by number of outstanding common stocks, whereas return-earnings variables are deflated by market value at the beginning of the fiscal year. The variables for goodwill-impairment losses and goodwill-amortisation charges take positive values. Changes in these variables are calculated on these positive values.

Four alternative sets of firm-year observations are employed: total available observations with and without outliers and non-missing observations with and without outliers. The non-missing set of observations is used to test differences in adjusted R-squares in section 7.2.7 below. For the sake of brevity, only descriptive statistics and correlation analyses for total available observations (with outliers) are reported here. Descriptive statistics and correlation analyses for the non-missing observations (with outliers) are reported in table A1 and A2 in appendix A.

Table 7.3 Descriptive statistics of variables in value-relevance regressions

Panel A – Price-book-earnings regressions (deflated by number of outstanding common stocks at time t)

	N	*Mean*	*Median*	*First quartile*	*Third quartile*	*Standard deviation*
$P_{i,t}$	910	6.237	4.238	2.335	8.07	6.185
$(E+GIM)_{i,t}$	909	0.472	0.283	0.127	0.591	0.916
$GIM_{i,t}$	909	0.033	0	0	0	0.203
$(EQ\text{-}GW)_{i,t-1}$	909	1.444	0.588	0.031	1.823	3.163
$GW_{i,t-1}$	909	0.946	0.435	0.150	1.198	1.350
$GAM_{i,t}$	767	0.072	0.035	0.015	0.094	0.093
$(EQCA\text{-}GWCA)_{i,t-1}$	785	1.214	0.500	0.009	1.601	2.760
$GWCA_{i,t-1}$	785	0.891	0.424	0.167	1.146	1.252
$GIMC_{i,t}$	767	0.026	0	0	0	0.190
$GAMC_{i,t}$	767	0.070	0.034	0.014	0.092	0.093
$(EQCAI\text{-}GWCAI)_{i,t-1}$	785	1.214	0.500	0.009	1.601	2.760
$GWCAI_{i,t-1}$	785	0.863	0.409	0.143	1.126	1.228

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Panel B – Return-earnings regressions (deflated by market value at time t-1)

	N	***Mean***	***Median***	***First quartile***	***Third quartile***	***Standard deviation***
$R_{i,t}$	900	0.133	0.118	-0.166	0.344	0.508
$(E+GIM)_{i,t}$	899	0.078	0.074	0.051	0.101	0.110
$\Delta(E+GIM)_{i,t,t-1}$	895	0.007	0.009	-0.015	0.030	0.130
$GIM_{i,t}$	899	0.007	0.000	0	0	0.049
$\Delta GIM_{i,t,t-1}$	895	-0.006	0.000	0	0	0.171
$GAM_{i,t,}$	764	0.019	0.011	0.004	0.024	0.036
$\Delta GAM_{i,t,t-1}$	764	$5.23*10^{-4}$	$1.36*10^{-4}$	$-2.79*10^{-4}$	0.002	0.015
$GIMC_{i,t}$	764	0.006	0	0	0	0.045
$\Delta GIMC_{i,t,t-1}$	893	-0.006	0	0	0	0.143
$GAMC_{i,t}$	764	0.018	0.011	0.003	0.024	0.031
$\Delta GAMC_{i,t,t-1}$	764	$5.32*10^{-5}$	$7.82*10^{-5}$	$-4.34*10^{-4}$	0.002	0.017

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$P_{i,t}$ is stock price of firm i, time t; $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $GIM_{i,t}$ is reported goodwill-impairment losses of firm i, period t; $(EQ\text{-}GW)_{i,t-1}$ is book equity reduced by book goodwill of firm i, time t-1; $GW_{i,t-1}$ is book goodwill of firm i, time t-1; $GAM_{i,t}$ is as-if accounted goodwill-amortisation charges of firm i, period t (amortisation-only method); $(EQCA\text{-}GWCA)_{i,t-1}$ is as-if accounted book equity reduced by as-if accounted book goodwill of firm i, time t-1 (amortisation-only method); $GWCA_{i,t-1}$ is as-if accounted book goodwill of firm i, time t-1 (amortisation-only method); $GAMC_{i,t}$ is as-if accounted goodwill-amortisation charges of firm i, period t (amortisation-and-impairment method); $GIMC_{i,t}$ is as-if accounted goodwill-impairment losses of firm i, period t (amortisation-and-impairment method); $(EQCAI\text{-}GWCAI)_{i,t-1}$ is as-if accounted book equity reduced by as-if accounted book goodwill of firm i, time t-1(amortisation-and-impairment method); $GWCAI_{i,t-1}$ is as-if accounted book goodwill of firm i, time t-1(amortisation-and-impairment method); $R_{i,t}$ is stock return of firm i, period t; $\Delta(E+GIM)_{i,t,t-1}$ is changes in pre-impairment net earnings of firm i from period t-1 to t; $\Delta GIM_{i,t,t-1}$ is changes in reported goodwill-impairment losses of firm i from period t-1 to t; $\Delta GAM_{i,t,t-1}$ is as-if accounted goodwill-amortisation charges of firm i from period t-1 to t (amortisation-only method); $\Delta GIMC_{i,t,t-1}$ is changes in as-if accounted goodwill-impairment losses of firm i, period t-1 to t (amortisation-and-impairment method); $\Delta GAMC_{i,t,t-1}$ is changes in as-if accounted goodwill-amortisation charges of firm i from period t-1 to t (amortisation-and-impairment method). Goodwill-impairment losses and goodwill-amortisation charges take positive values. All independent variables in price-book-earnings regressions are deflated by number of outstanding common stocks at time t. All variables in return-earnings regressions are deflated by market value at time t-1. Descriptive statistics are reported for the all available observations (with outliers).

The number of firm-year observations is reduced compared to the overall number of observations in the final sample (1122 firm-year observations for the period 2005-2009). There are two reasons for this reduction: Missing values and the additional criterion for as-if accounting numbers. As-if accounting numbers require complete series of annual reports (or financial statements) all back to the pre-IFRS adoption year 2004. 767 firm-year observations are meeting this requirement. Any reduction below 767 observations is due to missing values in the variables.

Earnings-per-share *(E+GIM)* is on average positive (Mean: 0.47, Median: 0.28). 67 out of 909 firm-year observations (7.37%) have negative net earnings numbers. Goodwill-impairment per share *(GIM)* has a mean value of 0.03. The median value is zero as more than half of the firm-year observations have no goodwill-impairment losses. Book equity reduced by book goodwill per share *(EQ-GW)* has a positive mean value of 1.44 (Median: 0.59) and a substantial variation around the mean suggesting that some firms have negative equity values after the deduction of book goodwill. This is the case for 212 out of 909 firm-year observations (23.32%). As-if accounting numbers per share differs as expected from as-accounting numbers. Amortised goodwill *(GWCA)* has a lower book value on average (Mean: 0.89, Median: 0.42) than goodwill tested for impairment losses *(GW)* (Mean: 0.95, Median: 0.435), which is as expected. Amortisation charges are recognised each year following a systematic amortisation plan. Impairment losses, however, are more transitory. Average amortisation charges *(GAM)* are also larger (Mean: 0.07) than average impairment losses *(GIM)* (Mean: 0.03). This is due to the frequency of amortisation charges rather than amortisation charges being larger in magnitude than impairment losses. There are 766 calculated amortisation charges, but only 221 recognised impairment losses.[28] The rest of the impairment losses are zero. When excluding impairment losses and amortisation charges that equal zero, average impairment-losses per share (Mean. 0.13) far outweighs average amortisation-charges per share (Mean: 0.07).

Amortised and impairment-tested goodwill *(GWCAI)* has on average lower book value (Mean: 0.86, Median: 0.41) than goodwill reported under the impairment-only method *(GW)* (Mean: 0.95, Median: 0.44) or the amortisation-only method *(GWCA)* (Mean: 0.89, Median: 0.42). This is also as expected. Impairment losses are calculated as the positive difference between the book value of goodwill after the deduction of any amortisation charges, and the recoverable amount. Impairment losses are additional charges to those already recognised as amortisation charges. These additional charges will in turn affect subsequent amortisation charges and subsequent impairment losses. Consistent with this, both goodwill-amortisation charges per share (*GAMC)* (Mean: 0.07) and goodwill-impairment losses per share (*GIMC)* (Mean: 0.03) are on average lower under the combined amortisation-and-impairment method than amortisation charges and impairment losses under the other methods with amortisation or impairment testing. Equity reduced by book goodwill per share is not affected by the chosen method as the accumulated effects of each method are deducted from the equity number. The descriptive statistics of book equity less book goodwill *(EQ-GW)* are different, but this is simply because more observations are included when calculating the descriptive statistics for this variable than for the two other equity variables.

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[28] There are 246 impairment losses in the final sample for the years 2005-2009, but 25 of these impairment losses are not included because they are recognised in firms without complete series of annual reports (financial statements) back to the IFRS-adoption year (See the additional sample criterion discussed in section 7.2.1 above).

The descriptive statistics for the variables in the return-earnings regressions differ due to different scaling and to some extent different sets of firm-year observations. As price-book-earnings regressions are deflated by number of outstanding common stocks, return-earnings regressions are deflated by market value at the beginning of the fiscal year. Only some of these descriptive statistics are commented. Changes in goodwill-impairment losses *(ΔGIM)* have a negative mean value of -0.006, suggesting that impairment losses the current year is on average lower than impairment losses the previous year. This is due to the 2009 observations. If these are excluded, the mean value of this variable turns positive (Mean: 0.004). Changes in amortisation charges *(ΔGAM)* have a mean value close to zero (Mean: $5.23*10^{-4}$). This indicates that amortisation charges are rather constant from one year to another.

Table 7.4 reports Pearson and Spearman correlations between variables in the value-relevance regressions. For easier interpretation of the correlation coefficients, all the variables for goodwill-impairment losses and goodwill-amortisation charges take positive values. Changes in these variables are calculated on these positive values. A negative association between goodwill-impairment losses and stock returns means that large absolute values of goodwill-impairment losses are associated with lower stock returns. Correlations are estimated on all available observations in the period 2005-2009. The correlation coefficients for non-missing observations are given in table A2.

Table 7.4 Correlations between variables in value-relevance regressions

Panel A – Spearman(Top) and Pearson (Bottom) correlations for variables in price-book-earnings regressions

	$P_{i,t}$	$(E+GIM)_{i,t}$	$GIM_{i,t}$	$(EQ\text{-}GW)_{i,t-1}$	$GW_{i,t-1}$	$GAM_{i,t}$	$(EQCA\text{-}GWCA)_{i,t-1}$	$GWCA_{i,t-1}$	$GIMC_{i,t}$	$GAMC_{i,t}$	$(EQCAI\text{-}GWCAI)_{i,t-1}$	$GWCAI_{i,t-1}$
$P_{i,t}$	1.000	0.743***	0.029	0.401***	0.202***	0.223***	0.401***	0.228***	0.003	0.220***	0.401***	0.226***
$(E+GIM)_{i,t}$	0.549***	1.000	0.060*	0.350***	0.192***	0.196***	0.350***	0.221***	0.025	0.189***	0.350***	0.210***
$GIM_{i,t}$	0.020	0.054	1.000	-0.001	0.189***	0.174***	-0.001	0.194***	0.625***	0.173***	-0.001	0.191***
$(EQ\text{-}GW)_{i,t-1}$	0.457***	0.355***	0.112***	1.000	-0.298***	-0.284***	1.000***	-0.271**	0.076	-0.294***	1.000***	-0.283***
$GW_{i,t-1}$	0.296***	0.093***	0.284***	-0.138***	1.000	0.899***	-0.298***	0.969***	0.068	0.912***	-0.298***	0.987***
$GAM_{i,t}$	0.340***	0.117***	0.264***	-0.098***	0.886***	1.000	-0.288***	0.882***	0.030	0.987***	-0.284***	0.866***
$(EQCA\text{-}GWCA)_{i,t-1}$	0.455***	0.523***	0.133***	1.000***	-0.114***	-0.098***	1.000	-0.271***	0.076**	-0.294***	1.000***	-0.283***
$GWCA_{i,t-1}$	0.325***	0.097***	0.294***	-0.095***	0.986***	0.862***	-0.095***	1.000	0.072**	0.864***	-0.271***	0.975***
$GIMC_{i,t}$	0.017	0.067***	0.987***	0.136***	0.237***	0.213***	0.136***	0.244***	1.000	0.031	0.076**	0.073**
$GAMC_{i,t}$	0.334***	0.114***	0.263 ***	-0.104***	0.884***	0.996***	-0.104***	0.848***	0.213***	1.000	-0.294***	0.884***
$(EQCAI\text{-}GWCAI)_{i,t-1}$	0.455***	0.523***	0.133***	1.000***	-0.114 ***	-0.098 ***	1.000***	-0.095***	0.136***	-0.104***	1.000	-0.283***
$GWCAI_{i,t-1}$	0.320***	0.093***	0.296***	-0.105 ***	0.995***	0.864***	-0.105***	0.992***	0.246***	0.862 ***	-0.105***	1.000

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Panel B – Spearman(Top) and Pearson (Bottom) correlations for variables in return-earnings regressions

	$R_{i,t}$	$(E+GIM)_{i,t}$	$\Delta(E+GIM)_{i,t,t-1}$	$GIM_{i,t}$	$\Delta GIM_{i,t,t-1}$	$GAM_{i,t}$	$\Delta GAM_{i,t,t-1}$	$GIMC_{i,t}$	$GAMC_{i,t}$	$\Delta GIMC_{i,t,t-1}$	$\Delta GAMC_{i,t,t-1}$
$R_{i,t}$	1.000	0.291***	0.272***	-0.111***	-0.198***	0.021	-0.237***	-0.121***	0.020	-0.186***	-0.233***
$(E+GIM)_{i,t}$	0.298***	1.000	0.505***	-0.024	-0.013	-0.091**	-0.136***	-0.021	-0.100***	-0.006	-0.113***
$\Delta(E+GIM)_{i,t,t-1}$	0.125***	0.637 ***	1.000	-0.074***	-0.034	-0.029	-0.131***	-0.082**	-0.030	-0.022	-0.111***
$GIM_{i,t}$	-0.123***	-0.035	-0.055	1.000	0.488***	0.136***	-0.046	0.622***	0.134***	0.336***	-0.073**
$\Delta GIM_{i,t,t-1}$	-0.186***	-0.035	0.013	0.613***	1.000	-0.031	0.063*	0.461***	-0.0001	0.671***	0.100*
$GAM_{i,t}$	0.196***	0.009	-0.047	0.187***	-0.683***	1.000	0.190***	0.010	0.987***	-0.019	0.157***
$\Delta GAM_{i,t,t-1}$	-0.005	-0.067*	-0.128***	0.012***	0.073**	0.015	1.000	-0.075**	0.2025***	0.043	0.951***
$GIMC_{i,t}$	-0.132***	-0.041	-0.059	0.990***	0.281***	0.160***	0.013	1.000	0.010	0.587	-0.088***
$GAMC_{i,t}$	0.189***	-0.002	-0.047	0.217***	-0.572***	0.987***	0.031	0.188***	1.000	0.020	0.183***
$\Delta GIMC_{i,t,t-1}$	-0.177 ***	-0.036	0.006	0.272***	0.995***	-0.673***	0.071**	0.280***	-0.5601***	1.000	0.095***
$\Delta GAMC_{i,t,t-1}$	-0.068*	-0.059	-0.087**	0.006	0.477 ***	-0.310***	0.875***	0.008	-0.2480	0.475***	1.000

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$P_{i,t}$ is stock price of firm i, time t; $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $GIM_{i,t}$ is reported goodwill-impairment losses of firm i, period t; $(EQ-GW)_{i,t-1}$ is book equity reduced by book goodwill of firm i, time t-1; $GW_{i,t-1}$ is book goodwill of firm i, time t-1; $GAM_{i,t}$ is as-if accounted goodwill-amortisation charges of firm i, period t (amortisation-only method); $(EQCA-GWCA)_{i,t-1}$ is as-if accounted book equity reduced by as-if accounted book goodwill of firm i, time t-1 (amortisation-only method); $GWCA_{i,t-1}$ is as-if accounted book goodwill of firm i, time t-1 (amortisation-only method); $GAMC_{i,t}$ is as-if accounted goodwill-amortisation charges of firm i, period t (amortisation-and-impairment method); $GIMC_{i,t}$ is as-if accounted goodwill-impairment losses of firm i, period t (amortisation-and-impairment method); $(EQCAI-GWCAI)_{i,t-1}$ is as-if accounted book equity reduced by as-if accounted book goodwill of firm i, time t-1(amortisation-and-impairment method); $GWCAI_{i,t-1}$ is as-if accounted book goodwill of firm i, time t-1(amortisation-and-impairment method); $R_{i,t}$ is stock return of firm i, period t; $\Delta(E+GIM)_{i,t,t-1}$ is changes in pre-impairment net earnings of firm i from period t-1 to t; $\Delta GIM_{i,t,t-1}$ is changes in reported goodwill-impairment losses of firm i from period t-1 to t; $\Delta GAM_{i,t,t-1}$ is as-if accounted goodwill-amortisation charges of firm i from period t-1 to t (amortisation-only method); $\Delta GIMC_{i,t,t-1}$ is changes in as-if accounted goodwill-impairment losses of firm i, period t-1 to t (amortisation-and-impairment method); $\Delta GAMC_{i,t,t-1}$ is changes in as-if accounted goodwill-amortisation charges of firm i from period t-1 to t (amortisation-and-impairment method). Goodwill-impairment losses and goodwill-amortisation charges take positive values. All independent variables in price-book-earnings regressions are deflated by number of outstanding common stocks at time t. All variables in return-earnings regressions are deflated by market value at time t-1.

*indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). Correlation coefficients are estimated for all available observations (with outliers).

Panel A reports the correlations between variables in the price-book-earnings regressions. Several of the variables have predicted correlations. Pre-impairment net earnings *(E+GIM)*, book goodwill *(GW)* and book equity less book goodwill *(EQ-GW)* are all significantly positively correlated with stock prices as predicted. The same is true for the as-if accounted book goodwill *(GWCA, GWCAI)* and as-if accounted book equity less book goodwill *(EQCA-GWCA, EQCAI-GWCAI)* under the amortisation method and the amortisation-and-impairment method. Goodwill-impairment losses *(GIM)* and as-if accounted impairment losses *(GIMC)*, however, have positive, but insignificant correlation coefficients. These results are consistent for Pearson and Spearman correlations.

As-if-amortisation charges *(GAM, GAMC)* are found to be significantly positively correlated with stock prices. This suggests that firms with higher amortisation charges on average have higher stock prices. A closer examination of this positive association is necessary. There are two essential parameters determining amortisation charges: depreciable amounts and amortisation periods. Firms having higher depreciable amounts of goodwill have higher amortisation charges and higher stock prices. The correlation between depreciable amounts and stock prices is significantly positive (Pearson-coeff. 0.334, p-value 0.000). The correlation between length of amortisation periods and stock prices, however, is found to be positive (Pearson-coeff. 0.127, p-value 0.000), not negative, which would have been consistent with a positive association between amortisation charges and stock prices. Longer amortisation periods imply lower, not higher amortisation charges. There are several possible explanations for a positive correlation between amortisation charges and stock prices. One explanation is that goodwill amortisation reflects something else than consumption of goodwill. One possibility is that these charges might proxy some unrecognised economic value.

An alternative explanation might be that the correlation is driven by econometrical problems such as scale effects. A more careful investigation of this positive association is given in section 7.2.5 below.

Panel B reports the correlations between variables in the return-earnings regressions for the period 2005-2009. Pre-impairment net earnings *(E+GIM)* and changes in pre-impairment net earnings Δ*(E+GIM)* are significantly positively correlated with stock returns as predicted. In contrast to the price-book earnings regression, goodwill-impairment losses *(GIM)* are significantly negatively correlated with stock returns, indicating that impairers suffer from lower stock returns on average than non-impairers. Changes in impairment losses *Δ(GIM)* are also significantly negatively correlated with stock returns. This is also consistent with predictions. An increase in impairment losses the current year relative to the previous year signifies an additional and even larger reduction in the economic value of goodwill. If these reported impairment losses reflect economic impairment, they should be mapped in current stock return. Goodwill-amortisation charges *(GAM)*, however, are significantly positively correlated with stock returns. This result is limited to Pearson correlation. The Spearman correlation coefficient is insignificantly positive. Possible explanations why firms with higher amortisation charges also have higher stock returns are given in section 7.2.5 below.

7.2.3. Value-relevance regressions – introduction

The regression analyses in the following sections are conducted on firm-year observations for the fiscal years 2005-2009. Several sets of observations are investigated: samples of non-missing observations for single regressions with and without outliers and samples of non-missing observations across several regressions with and without outliers. Samples of non-missing observations *for single regressions* will vary by the variables included in these regressions. These samples will be the total number of available non-missing observations for main variables and control variables in single regressions. Samples of non-missing observations *across several regressions* are employed to compare adjusted R-squares for regressions run on accounting numbers reported under alternative accounting methods. For these comparisons to be valid, the regressions must be run on the same set of firm-year observations. Two samples are established: One with non-missing observations for all main variables in the price-book-earnings regressions, and one with non-missing observations for all main variables in return-earnings regressions. Main variables are those specified in the value-relevance regressions in chapter six. All regressions are run with and without outliers. Outliers are those observations having a value on Cook's distance larger than *4/n* where *n* is the total number of observations in the given regression (e.g. Cook 1977, 1979, Bollen and Jackman 1990).

Tests of heteroscedasiticity indicate that price-book-earnings regressions suffer from heteroscedastic disturbance. This could be the result of scaling problems. Two tests of heteroscedasticity are conducted: The White test (1980) and Breusch-Pagan test (1979) (Results of these tests are not tabulated). The White test is a joint test of heteroscedastic disturbance and misspecification (Greene 2000:508, Gujarati 2003:412). The test may reveal heteroscedasticity, but it may also reveal some specification errors in the regression model. This suggests that the White test should be used together with other tests of heteroscedastic disturbance, for instance, the Breusch-Pagan test. To reduce impact of heteroscedasticity, standard errors are White-adjusted (White 1980) and clustered at firm-level. White-adjusted standard errors will suffer from less cross-sectional heteroscedasticity. Clustering at firm-level is supposed to mitigate the effect of time-dependency in residuals. White-adjusted standard errors clustered at firm-level are, therefore, employed to form all the t-statistics. This gives conservative estimates of the standard errors (e.g. Rogers 1993, Hoechle 2007, Petersen 2009). Additional investigation of potential scaling problems is conducted when carrying out the analysis.

One set of control variables are employed in price-book-earnings regressions and another in return-earnings regressions. Variables for economic growth, firm size and industry sector are employed as control variables in price-book-earnings regressions. Economic growth is expected to be positively associated with book goodwill, as economic goodwill by definition is expectations of future economic growth (Barth et al. 2001, Holthausen and Watts 2001). It is, therefore, important to investigate whether value relevance of book goodwill is driven by growth prospects. Firm size is included to investigate whether stock prices vary by size. Positive associations between firm size and stock prices might indicate problems of scale effects. Industry-sector dummies are supposed to reflect systematic differences in stock prices across industry sectors. Variables for economic growth, firm size, financial leverage and industry sector are employed as control variables in return-earnings regressions. Growth is profitable if return on equity is higher than required return on equity. Higher profitable growth should, therefore, be associated with higher stock returns. Financial leverage measured by debt-to-equity ratios is expected to reflect financial risk. Any increases in financial leverage are predicted to increase cost of equity capital and thereby expected rate of return on equity (Miller and Modigliani 1958). This suggests a positive association between financial leverage and stock returns. Although, less theoretically founded than financial leverage, firm size is also believed to proxy for risk. Smaller firms are found to have higher stock returns on average than larger firms (Fama and French 1992, 1993, 1995) which suggests a negative association between firm size and stock returns. A positive association between firm size and stock returns might indicate problems due to scale effects. And finally, stock returns are supposed to vary across industry sectors due to industry-sector characteristics such as financial health and growth opportunities (Barth et al. 2001).

7.2.4. Value relevance of goodwill under the impairment-only method

This section investigates value relevance of book goodwill and goodwill-impairment losses reported under current IFRS. The results from price-book-earnings regressions for the fiscal years 2005-2009 are given in table 7.5 below. Two regression models are tested: the basic price-book-earnings model in table 6.1 and the basic model with control variables for economic growth, firm size and industry sector.

Table 7.5 Value relevance of goodwill-impairment losses – hypotheses 1a and 1b

		Stock price t							
		Main model				***Main model with control variables***			
		Available sample		*Non-missing*		*Available sample*		*Non-missing*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive Outliers*	*Inclusive outliers*	*Exclusive outliers*
Intercept		2.529***	2.117***	2.354***	1.993***	-15.670***	-11.680***	-17.181**	-11.251***
		(7.28)	(9.45)	(6.04)	(8.51)	(-2.66)	(-3.25)	(-2.59)	(-2.82)
$(E+GIM)_{i,t}$	+	2.616***	3.758***	3.211***	4.644***	2.039***	3.470***	2.493***	4.259***
		(4.72)	(9.13)	(3.63)	(8.05)	(3.96)	(7.86)	(2.79)	(7.35)
$GIM_{i,t}$	-	-4.401***	-3.812***	-4.363**	-3.177**	-3.630***	-2.542***	-3.550**	-2.275**
		(-3.30)	(-2.97)	(-2.54)	(-2.55)	(-2.73)	(-2.67)	(-2.20)	(-2.51)
$(EQ-GW)_{i,t-1}$	+	0.752***	0.737***	0.696**	0.601***	0.683***	0.648***	0.621**	0.553***
		(5.25)	(12.39)	(2.60)	(5.85)	(4.56)	(10.56)	(2.45)	(5.06)
$GW_{i,t-1}$	+	1.625***	1.194***	1.528***	0.985***	1.373***	1.034***	1.292***	0.882***
		(5.17)	(6.73)	(4.18)	(5.67)	(4.58)	(6.29)	(3.73)	(5.29)
$GROWTH\_SALES_{i,t}$						0.677***	0.988**	0.613**	1.154***
						(2.76)	(2.54)	(2.56)	(2.71)
$lnSIZE\_MV_{i,t}$						1.002***	0.747***	1.078***	0.725***
						(3.56)	(4.33)	(3.44)	(3.76)
$RESOURCES_{i,t}$						-2.156	-1.948*	-2.552	-2.351*
						(-0.92)	(-1.81)	(-0.87)	(-1.82)
$GENERAL\_INDUSTRIALS_{i,t}$						-2.447**	-1.659**	-2.807**	-1.916**
						(-2.04)	(-2.34)	(-2.13)	(-2.51)
$CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-3.397**	-2.864***	-3.511**	-2.939***
						(-2.54)	(-3.60)	(-2.56)	(-3.47)
$NON\text{-}CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-0.950	-0.649	-1.091	-0.585
						(-0.60)	(-0.74)	(-0.62)	(-0.59)
$CYCLICAL\_SERVICES_{i,t}$						-3.309***	-2.268***	-3.461**	-2.273***
						(-2.63)	(-3.08)	(-2.51)	(-2.85)
$NON\_CYCLICAL\_SERVICES_{i,t}$						-5.412***	-4.282***	-6.976***	-4.190***
						(-3.38)	(-4.83)	(-4.38)	(-4.17)
$UTILITIES_{i,t}$						-4.041***	-2.699***	-4.337**	-2.861**
						(-2.69)	(-2.68)	(-2.60)	(-2.51)
$INFORMATION\_TECHNOLOGY_{i,t}$						-3.732***	-2.820***	-4.167***	-3.005***
						(-2.85)	(-3.45)	(-2.98)	(-3.44)
$FINANCE_{i,t}$						-2.941**	-1.794**	-2.762**	-1.799**
						(-2.28)	(-2.25)	(-2.00)	(-2.06)
N		909	844	762	715	909	851	762	721
F-value		21.48***	84.10***	18.17***	53.30***	10.10***	42.62***	10.26***	26.18***
Adjusted R^2		0.489	0.536	0.480	0.570	0.548	0.643	0.537	0.650
Max VIF		1.22	1.18	1.40	1.48	5.27	5.43	5.26	5.51
Mean VIF		1.16	1.13	1.26	1.28	2.23	2.21	2.22	2.24

Stock price of firm i, time t, is dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $GIM_{i,t}$ is reported goodwill-impairment losses of firm i, period t; $(EQ-GW)_{i,t-1}$ is book equity reduced by book goodwill of firm i, time t-1;$GW_{i,t-1}$ is book goodwill of firm i, time t-1; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, from period t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of the equity market value of firm i, time t. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES,$UTILITIES_{i,t}$, INFORMATION $\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector. Goodwill-impairment losses take positive values. Regression coefficients are unstandardised. t-statistics are given in parentheses. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). Observations with Cook's distance larger than 4/n where n is total number of observations are considered as outliers. All independent variables in price-book-earnings regressions are deflated by number of outstanding common stocks at time t.

Table 7.5 reports results from testing hypothesis 1a and 1b. Hypothesis 1a predicts that book goodwill is positively associated with stock prices, whereas hypothesis 1b predicts that goodwill-impairment losses are negatively associated with stock prices. As reported in the above table, all variables in the basic model are significantly associated with stock prices. Pre-impairment net earnings *(E+GIM)* and book equity less book goodwill *(EQ-GW)* are positively associated with stock prices in all eight regressions. This is consistent with predictions. Higher pre-impairment net earnings should be associated with higher stock prices. Higher book equity signals more economic net assets and should be associated with higher stock prices.

Consistent with predictions in hypothesis 1a book goodwill *(GW)* is found to be significantly positively associated with stock prices in all eight regressions. This suggests that book goodwill reflects value-relevant information when accounted for under the current impairment-only method. A significantly positive coefficient on book goodwill *(GW)* also supports the notion that goodwill represents an economic asset that should be capitalised on the balance sheet. Similar results are reported in previous studies (e.g. Amir et al. 1993, Wang 1993, Chauvin and Hirschey 1994, Jennings. et al, 1995, Huijgen 1996, Barth and Clinch 1996, Wilkins et al. 1998, Henning et al. 2000, Petersen 2002, Bugeja and Gallery 2006). Given a measurement perspective, not only the sign and significance, but also the magnitude of the regression coefficients should be interpreted (e.g. Barth 2000). The regression coefficient on book goodwill *(GW)* is significantly higher than +1 in some of these regressions. This indicates that book goodwill is significantly lower than the economic goodwill (Total available sample with outliers: F-value 3.95 using the Wald-test). One possible explanation is that stock prices reflect total goodwill, the total of internally-generated and purchased goodwill, not just purchased goodwill. The balance sheet, however, will only recognise purchased goodwill.

Consistent with predictions in hypothesis 1b, goodwill-impairment losses *(GIM)* are significantly negatively associated with stock prices. This suggests that impairment losses reported under the impairment-only method reflect value-relevant information. These losses are, therefore, reflecting economic losses in stock prices. This result, however, only holds on average. These losses might be subject to earnings management in certain firms and in certain periods of time where incentives for manipulation are strong. The regression coefficients of these losses are significantly lower than -1 suggesting that average economic losses recognised by the capital market are larger in absolute values than reported impairment losses (Total available sample inclusive without: F-value 6.48 using the Wald-test). There are at least three interpretations of these findings. The capital market recognises impairment losses in total goodwill, the total of internally-generated goodwill and purchased goodwill, rather than just purchased goodwill. As total goodwill on average is larger than book goodwill, impairment losses will probably be larger than those reported in the financial statements. A different argument is that impairment losses are systematically understated due to accounting regulation or earnings management. Impairment losses are found to be reported with a time lag relative to the recognition of such losses in stock prices (e.g. Heflin and Warfield 1997, Hirschey and Richardson 2002, 2003, Li et al. 2004). Previous years' impairment losses are also found to be associated with current year's impairment losses (e.g. Elliot and Hanna 1996, Francis et al. 1996). This is consistent with impairment losses being systematically understated. Managers may have incentives to understate impairment losses in order to overstate net earnings and net-asset values. Given semi-strong market efficiency, the capital market is not on average misled by such earnings management, which implies that impairment losses reflected in stock prices reflect economic impairment. A final argument, inconsistent with market efficiency, is that the capital market on average overreacts to impairment losses.

Most of the control variables are significantly associated with stock prices. Growth in sales *(GROWTH_SALES)* is indicative of higher future cash flows, which suggests a positive association between growth and stock prices. Evidence consistent with these predictions is shown in table 7.5. A significantly positive association is found between growth and stock prices in all four regressions with control variables. Book goodwill *(GW)* is still significantly positively associated with stock prices when growth is included as a control variable. This implies that book goodwill has incremental value relevance beyond the relevance provided by growth in sales. A significantly positive association is also found between firm size *(lnSIZE_MV)* and stock prices in all four regressions with control variables. This might indicate that the regressions suffer from scale effects. The literature suggests a number of remedies to mitigate or prevent scale effects (e.g. Christie 1987, Landsman and Magliolo 1988, Easton and Sommers 2003). Alternative scaling proxies supposed to be more highly associated with the true, but unobservable scale factor are suggested. A recent study by Barth and Clinch (2009), however, conclude that the conventional scale proxy, number of common stocks, is as efficient to mitigate scale effects as any other scale remedy. However, even after scaling by number of common stocks, the above results suggest that there might be problems with scale effects. This calls for robustness tests using alternative scale proxies such as total asset and total sales. Scale effects are discussed more carefully below. Other control variables are also found to be significantly associated with stock prices. Most of the industry-sector dummies are negatively associated with stock prices, suggesting that these industries have firms with lower stock prices on average than the benchmark-industry sector: basic industries. Taken together, including control variables has no substantial effect on main results from the basic regression.

Additional analyses are conducted to investigate the robustness of the results in table 7.5. The results might be affected by observations from certain years or certain firms, alternative time lags in stock prices and alternative scaling proxies. The first robustness test concerns the impact of observations from certain years. Two sets of analyses are conducted: Including dummy variables for each year to investigate systematic differences in stock prices across years and excluding firm-year observations from the financial-recession year 2008 (See table A3 and A4 in appendix A). The inclusion of year-dummies allows the regressions to have separate intercepts for each year. The dummy for the financial-recession year *(YEAR_2008)* is significantly negatively associated with stock prices in all eight regressions (See table A3). This is as expected. Stock prices are on average significantly lower in this year compared to the benchmark year 2005. However, the inclusion of year-dummies has no overall effect on the main results.

The financial-recession year 2008 is extraordinary when it comes to the number and size of impairment losses. More than 26.5% of impairment losses over the period 2005-2009 are reported in 2008. According to the ratio of 2008 observation to all firm-year observations, 19.3% of impairment losses should have been reported this year. Besides, average impairment losses is 99.7 million British Pounds (£) in 2008 compared to 61.3 million British Pounds (£) for the whole period (without 2008 observations). Excluding 2008-firm observations gives weaker results than those reported in table 7.5 (See table A4). Goodwill-impairment losses *(GIM)* are only significantly associated with stock prices in two out of eight regressions. In those regressions with insignificant coefficients, goodwill-impairment losses *(GIM)* are barely insignificantly or strongly insignificantly associated with stock prices. This suggests that the results in table 7.5 to some extent are driven by impairment losses reported in 2008. The results in table 7.5 might also be driven by firms having substantial book goodwill. To investigate whether value relevance varies by the size of book goodwill and goodwill-impairment losses, firm-year observations are separated in subsamples with substantial and non-substantial book goodwill and substantial and non-substantial goodwill-impairment losses. Those firms with book goodwill relative to total assets at the beginning of the fiscal year above the third quartile of that variable are considered to have substantial goodwill. Similarly, those firms with goodwill-impairment losses relative to total assets at the beginning of the fiscal year above the 95th percentile of that variable are considered to have substantial impairment losses.[29] The exclusion of firm-year observations with substantial book goodwill has no significant effect on the results reported in table 7.5 (See table A5). The same is not the case when excluding firm-year observations with substantial impairment losses (See table A6). The coefficient on goodwill-impairment losses *(GIM)* is now highly insignificant. These results demonstrate that the value relevance of goodwill-impairment losses is driven by the largest impairment losses.

Stock prices are collected at the end of the fiscal years. This is based on the assumption that all price-relevant accounting information for the fiscal year is reflected in stock prices at the end of that fiscal year. Some, however, have argued

[29] The split is not made at the same percentile. The reason is that goodwill-impairment losses are heavily skewed towards large absolute values, whereas book-goodwill values are more symmetrically distributed.

that stock prices should be measured with a time lag after the end of the fiscal year (e.g. Huigjen 1996:80, Jennings et al. 1996a, Collins et al. 1997, Ibrahim 1999:83, Petersen 2002:9, Bugeja and Gallery 2006, Barth et al. 2008, Beisland 2009:121). Lagged stock prices are used to ensure that price-relevant accounting information is reflected in stock prices. The time lag varies from zero to six months (e.g. Huigjen 1996:80. Barth et al. 2008), but the most common is a time lag of three months in stock prices (e.g. Jennings et al. 1996a, Collins et al. 1997, Ibrahim 1999:83, Bugeja and Gallery 2006, Beisland 2009:122). Graham and King (1998) find that a time lag between two months and four months provides the strongest associations between accounting numbers and stock prices. The choice between stock prices at the end of the fiscal year versus lagged stock prices is a trade off (Barth et al. 2001). Lagged stock prices have the advantage that prices more fully reflect information found in financial statements. At the same time, lagged stock prices may reflect price-relevant information for the subsequent fiscal year. If the capital market is strongly efficient, all information concerning the fiscal year should be reflected in stock prices at the fiscal-year end. In case of semi-strong market efficiency, this is not necessarily the case (Graham and King 1998). As no strong arguments are found for choosing one time lag rather than another, time lags of two, three and four months are employed for robustness-test reasons. The results of these robustness tests are reported in table A7 to table A9 in appendix A. As shown in these tables, the results are generally weaker with a time lag in stock prices. With a time lag of two months, the coefficients on goodwill-impairment losses *(GIM)* become insignificant in two out of eight regressions (See table A7). When the time lag increases to three months, three out of eight regressions report insignificant coefficients on goodwill-impairment losses *(GIM)* (See table A8). Somewhat surprisingly, only one out of eight regressions report insignificant coefficients on impairment losses when the time lag is four months (See table A9).

Firm size *(lnSIZE_MV)* has significantly positive coefficients in table 7.5 and in all robustness regressions reported in table A3 to table A9. This indicates that the results may suffer from scale effects. Different types of scale effects and how to detect and mitigate them are carefully discussed in the literature. Some main results from this literature will be discussed here. Scale effects occur in value-relevance regressions because firms having high market values generally have high book-equity values and high net earnings. A positive association between market values and book-equity values can, therefore, be explained by the fact that large firms tend to have high market values and high book-equity values (e.g. Christie 1987). Stated otherwise, the positive association between market values and book-equity values is not necessarily explained by the economic association between market values and book-equity values. Rather, the association might simply reflect differences in scale. However, scale and size are not synonymous constructs. Scale is differences in size that lacks interest to the research question. In value-relevance context this means that scale is differences in size that do not reflects differences in firms' economic fundamentals (Barth and Clinch 2009). In order to disentangle the effect of differences in size from pure scale effects, researchers must know the type of scale effect that is present in the observations and decide how this scale effect can be mitigated. In most cases the true scale factor is unobservable and thereby unknown. The literature suggests a number of remedies to mitigate potential scale effects. Most researchers argue that scale effects can best be dealt with by deflating all the variables with a scale proxy (Christie 1987, Landsman and Magliolo 1988, Easton 1998, Brown, Lo and Lys 1999, Lo and Lys 2000, Easton and Sommers 2003, Lara, Grambovas and Walker 2007, Barth and Clinch 2009). Others argue that scale effects can be mitigated by including the scale proxy as an independent variable (Barth and Kallupar 1996, Gu 2005).

A number of different scale proxies are suggested in the literature. The most common scale proxy in price-level regressions is number of outstanding common stocks. Other used scale proxies are total assets, book-equity values, total sales, net-capital contributions and stock prices at the beginning of the fiscal year (Barth and Kallapur 1996, Barth and Clinch 2001, Easton and Sommers 2003). Barth and Clinch (2009) make a careful investigation of different scale effects, how to detect them and mitigate them. Six different regressions are tested on simulated data: undeflated market-book-earnings regressions, deflated price-book-earnings regressions, deflated price-earnings regressions, return-earnings regressions and regressions scaled by contemporaneous market values. The degree of misspecification in these regressions are investigated by several metrics such as the frequency with which the t-statistics correctly reject the null hypothesis that the coefficients equal zero, the average-coefficient bias measured as the estimated coefficient minus the true coefficient and the average-absolute error measured as the absolute value of the coefficient bias. When no scale effects are present, the undeflated regressions perform the best. Price-level regressions are the second best whereas return-earnings regressions perform the worst. When several scale effects are present, the undeflated regressions perform worse than any other specifications. Price-level regressions, deflated by number of outstanding common stocks, seem to be the specification that performs well in presence of a variety of scale effects. Barth and Clinch (2009) argue that there are some features of the number of outstanding stocks and changes in them that link them to scale. For instance, when firms are raising equity capital, price per share remains the same, which leads to an increase in market values and numbers of outstanding stocks.

However, as demonstrated in table 7.5, scale does seem to be an issue in the above regressions even after deflating the variables with number of outstanding common stocks. This calls for robustness tests.

Two alternative scale proxies are employed: total assets at the beginning of the fiscal year and total sales for the fiscal year. The unscaled versions, not the per-share versions of the variables, are deflated with these proxies. The results for the regressions with total assets as deflator are heavily affected by outliers (See table A10). Book equity less book goodwill *(EQ-GW)*, goodwill-impairment losses *(GIM)* and book goodwill *(GW)* are generally insignificantly associated with market value deflated by total assets, when outliers are included. When outliers are excluded, all the main variables are significant with their predicted signs. The coefficient on firm size *(lnSIZE_MV)* is now insignificant. The results from regressions with total sales as deflator are similar to those reported in table 7.5 (See table A11). The coefficient on firm size *(lnSIZE_MV)*, however, is significantly positive or barely insignificant, suggesting that there, still, is some risk of scale effects.

According to Easton and Sommers (2003), scale is in the dependent variable, the stock prices, not the independent variables. They call for other remedies than deflating to mitigate scale effects. One procedure is to remove the correlation between stock prices and firm size. Following Barth et al. (2008:486), stock prices are first regressed on size and unstandardised residuals from that regression are collected. These residuals are employed as a dependent variable in a regression on accounting numbers per share. This procedure provides a strong control for potential scale effects, since the unstandardised residuals and size are orthogonalised. This does not imply, however, that there will be no association between these unstandardised residuals and size in a multiple regression, as the association between an independent variable (e.g. size) and the dependent variable depends on the correlations between this independent variable and all the other independent variables (Wooldridge 2009:80). The results from rerunning the regressions in table 7.5 are shown in table A12. The dependent variable is now the unstandardised residuals from the regression of stock prices on size. The overall results are unchanged. Book goodwill *(GW)* has a significantly positive coefficient and goodwill-impairment losses *(GIM)* a significantly negative coefficient in all eight regressions. Size *(lnSIZE_MV)*, however, is significantly associated with ustandardised residuals. This is due to the non-trivial correlations between size and the other independent variables. When running a regression of these residuals on size only, the regression coefficient is almost perfectly zero and highly insignificant (coeff. $2.91*10^{-9}$, t-value: 0.000. Results not tabulated). Taken together, the results in table 7.5 are unaffected or mainly unaffected by the exclusion of outliers, alternative time lags in stock prices, scaling by total assets and total sales and control for size by orthogonalisation. The results, however, are to some extent driven by large impairment losses mainly reported in the financial-recession year 2008.

Table 7.6 reports results from testing hypothesis 1c. Two regression models are tested: the basic return-earnings model in table 6.2 and the basic model with control variables for economic growth, firm size, financial leverage and industry sector.

Table 7.6 Value relevance of goodwill-impairment losses – hypothesis 1c

		Stock return t							
		Main model				***Main model with control variables***			
		Available sample		*Non-missing*		*Available sample*		*Non-missing*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*
Intercept		0.010	$8.28*10^{-5}$	$3.75*10^{-4}$	-0.011	-0.678***	-0.694***	-1.026***	-0.867***
		(0.29)	(-0.00)	(0.01)	(-0.61)	(-2.82)	(-3.12)	(-3.62)	(-3.67)
$(E+GIM)_{i,t}$	+	1.639***	1.255***	1.685***	1.440***	1.502***	1.184***	1.395***	0.986***
		(3.16)	(6.87)	(3.62)	(6.61)	(2.84)	(5.45)	(3.09)	(4.25)
$\Delta\ (E+GIM)_{i,t,t-1}$	+	-0.413	0.375***	-0.037	0.613***	-0.365	0.208	0.070	0.536***
		(-0.89)	(2.29)	(-0.13)	(3.60)	-0.76)	(1.12)	(0.25)	(3.30)
$GIM_{i,t}$	-	-0.758***	-1.084*	-0.704***	-1.792***	-0.635***	-0.147	-0.579***	-1.321**
		(-4.23)	(-1.81)	(-4.17)	(-2.90)	(-3.56)	(-0.20)	(-3.47)	(-2.52)
$\Delta GIM_{i,t,t-1}$	-	-0.447***	-1.651***	-0.449***	-0.534***	-0.471***	-1.835***	-0.472***	-0.556***
		(-7.80)	(-3.34)	(-7.35)	(-16.72)	(-8.19)	(-3.47)	(-7.83)	(-13.27)
$GROWTH\_SALES_{i,t}$						0.037	-0.010	0.010	-0.037
						(1.14)	(-0.18)	(0.33)	(-0.60)
$lnSIZE\_MV_{i,t}$						0.039***	0.041***	0.055***	0.049***
						(3.32)	(3.89)	(4.07)	(4.39)
$LEVERAGE_{i,t-1}$						$1.17*10^{-4}$***	$-7.19*10^{-4}$	$1.08*10^{-4}$***	$-8.43*10^{-4}$
						(4.03)	(-1.05)	(3.49)	(-1.15)
$RESOURCES_{i,t}$						-0.052	-0.160**	0.004	-0.055
						(-0.60)	(-2.26)	(0.05)	(-0.62)
$GENERAL\_INDUSTRIALS_{i,t}$						-0.132***	-0.162***	-0.145***	-0.157***
						(-3.16)	(-4.39)	(-4.06)	(-4.90)
$CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-0.154***	-0.140***	-0.140***	-0.111***
						(-2.84)	(-2.89)	(-3.18)	(-2.65)
$NON\text{-}CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-0.198***	-0.221***	-0.216***	-0.218***
						(-4.66)	(-5.56)	(-5.40)	(-5.74)
$CYCLICAL\_SERVICES_{i,t}$						-0.166***	-0.200***	-0.139***	-0.160***
						(-4.62)	(-5.54)	(-4.11)	(-4.75)
$NON\_CYCLICAL\_SERVICES_{i,t}$						-0.162**	-0.152**	-0.236	-0.195***
						(-2.43)	(-2.15)	(-3.52)	(-2.84)
$UTILITIES_{i,t}$						-0.195***	-0.229***	-0.240***	-0.226***
						(-4.18)	(-4.85)	(-4.99)	(-4.85)
$INFORMATION\_TECHNOLOGY_{i,t}$						-0.030	-0.168***	-0.014	-0.137**
						(-0.36)	(-2.63)	(-0.15)	(-2.29)
$FINANCE_{i,t}$						-0.110**	-0.160***	-0.087**	-0.104***
						(-2.61)	(-4.23)	(-2.18)	(-2.63)
N		895	862	762	728	895	858	762	729
F-value		23.85***	38.01***	21.40***	124.55***	12.79***	11.54***	12.02***	19.87***
Adjusted R^2		0.127	0.148	0.132	0.180	0.135	0.145	0.149	0.175
Max VIF		1.69	1.99	1.52	1.57	5.25	5.10	5.19	5.03
Mean VIF		1.39	1.66	1.30	1.30	2.16	2.19	2.09	2.05

Stock return of firm i, period t is dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $\Delta\ (E+GIM)_{i,t,t-1}$ is changes in pre-impairment net earnings of firm i from period t-1 to t; $GIM_{i,t}$ is reported goodwill-impairment losses of firm i, period t; $\Delta GIM_{i,t,t-1}$ is changes in reported goodwill-impairment losses of firm i from period t-1 to t; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, period from t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of equity-market value of firm i, time t; $LEVERAGE_{i,t-1}$ is debt-to-equity ratio of firm i, time t-1. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector. Goodwill-impairment losses take positive values. Regression coefficients are unstandardised. t-statistics are given in parentheses. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). Observations with Cook's distance larger than 4/n where n is total number of observations are considered as outliers.

All the main variables except from changes in pre-impairment earnings *Δ(E+GIM)* and goodwill-impairment losses *(GIM)* are significantly associated with stock returns in all eight regressions. Changes in pre-impairment earnings *Δ(E+GIM)* are significantly positively associated with stock returns in three out of eight regressions when regressions are run on firm-year observations without outliers. Goodwill-impairment losses *(GIM)* have a significantly negative coefficient in seven out of eight regressions. The insignificant coefficient is found when the regression is run on total available observations without outliers. A closer investigation reveals that the exclusion of 41 outliers removes some of the largest impairment losses in the sample which turns the regression coefficient insignificant. This supports the previously stated argument that value relevance of these losses is driven by the largest impairment losses. Taken together, these results support hypothesis 1c that impairment losses are negatively associated with stock returns. Not only levels of these losses *(GIM)*, but also changes in these losses (*ΔGIM)* are negatively associated with stock returns. This result is robust across all eight regressions in table 7.5. A negative coefficient makes sense since an increase in impairment losses the current year relative to the previous year represents additional and even larger reductions in cash-generating capacity in goodwill compared to the previous year, which should be mapped in current year's stock returns.

Growth measured as changes in total sales *(GROWTH_SALES)* has no significant association with stock returns. This means that firms experiencing high sales growth, do not necessary perform higher stock returns. Moreover, larger firms tend to have higher stock returns as demonstrated with a positive coefficient on firm size *(lnSIZE_MV)*. This might be indicative of scale effects. Financial leverage *(LEVERAGE)*, a proxy of financial risk, is positively associated with stock returns, which makes sense since higher financial risk on average should be associated with higher cost of capital and thereby higher stock returns. Most of the industry-sector dummies are negatively associated with stock returns, suggesting that there are some industry-sector differences when it comes to stock performance. In general, these industry sectors perform worse on average than firms in the benchmark-industry sector: basic industries.

As for price-book-earnings regressions, some robustness tests are conducted to investigate whether the results in table 7.6 are systematically affected by observations from certain years, from certain firms or the time period over which stock returns are measured. For instance, it might be the case that the results are driven by impairment losses reported in the financial-recession year 2008. Two sets of analyses are conducted: Including dummy variables for each year to investigate systematic differences across years and excluding firm-year observations from the financial-recession year 2008 (See table A13 and A14). The inclusion of year dummies has no substantial effect on the results in table 7.6 (See table A13). Pre-impairment net earnings *(E+GIM)*, goodwill-impairment losses *(GIM)* and changes in these losses *Δ(GIM)* are significantly associated with stock returns. Changes in pre-impairment net earnings *Δ(E+GIM)* are significant in six out of eight regressions. All the regression coefficients have their predicted signs. The coefficients on the year dummies are significantly negative except the 2009-year dummy *(YEAR_2009)*. This suggests that the average stock returns are significantly lower in 2006, 2007 and 2008 compared to the average stock return in 2005. In 2009, however, average stock return is significantly higher than in 2005.

When excluding observations from the financial-recession year 2008, the coefficients on goodwill-impairment losses *(GIM)* turn insignificant (See table A14). The coefficient on changes in impairment losses (*ΔGIM)*, however, is negative and highly significant. This might be the result of multicollinearity between goodwill-impairment losses *(GIM)* and changes in goodwill-impairment losses (*ΔGIM)*, since most of the observations of goodwill-impairment losses *(GIM)* and changes in these losses (*ΔGIM)* are identical when the 2008 observations are excluded. The correlation coefficient between these variables is high and significant (Pearson-coeff. 0.613, p-value 0.000). A low VIF-value (Variance Inflation Factor), however, indicates otherwise. The highest VIF-value for the main regressions is 1.58 and 4.86 in regressions with control variables.

The results in table 7.6 might be driven by firms having substantial book goodwill and/or firms reporting substantial goodwill-impairment losses. To examine these possibilities, the same procedures are employed here as for the previous price-book-earnings regressions. The sample of firm-year observations is split into subsamples with substantial and non-substantial book goodwill and substantial and non-substantial goodwill-impairment losses. The regressions in table 7.6 are rerun for the non-substantial subsamples (See table A15 and A16). When firm-year observations with substantial book goodwill are excluded, goodwill-impairment losses *(GIM)* are found to be significantly associated with stock returns in five out of eight regressions. The significance is generally lower in regressions excluding outliers. Changes in impairment losses *(ΔGIM)*, however, show quite the opposite pattern. The coefficients on this variable are significantly negative only in those regressions excluding outliers (See table A15). When firm-year observations with substantial impairment losses are excluded, goodwill-impairment losses *(GIM)* are insignificant in seven out of eight regressions (See table A16).

Stock returns are measured over the fiscal years in the regressions in table 7.6. Alternative return periods are suggested and applied in the literature. Rather than measuring stock returns over a period of twelve months (e.g. Plenborg 1999, Rees et al. 1996, Henning et al. 2000), it might be argued that stock returns should be measured over the fiscal year with an additional time lag (e.g. Huigjen 1996:80). This means that a time lag of three months leads to a total return period of 15 months. However, this specification may lead to autocorrelation problems due to overlapping return periods. Return periods of 12 months are applied here with a lag of two, three and four months. As expected, the results are sensitive to the period over which stock returns are measured (See table A17 to table A19). Goodwill-impairment losses *(GIM)* and changes in these losses *(ΔGIM)* are significantly negatively associated with stock returns, when the return period has a lag of two months relative to the fiscal year. The only exception is the coefficient on goodwill-impairment losses *(GIM)*, which has an insignificant coefficient on goodwill-impairment losses, when the main regression is run for the non-missing sample without outliers. This coefficient is close to zero and insignificant. The reason is that the outliers from this regression comprise firm-year observations with the largest impairment losses. When these are excluded, the coefficient turns insignificant. A time lag of three or four months turns the coefficients on these variables insignificant in most of the regressions. With a time lag of three months, none of the coefficients on goodwill-impairment losses *(GIM)* are significant. Six of eight coefficients on changes in goodwill-impairment losses *(ΔGIM)* are significantly negative (See table A18). With a time lag of four months, two of the coefficients on goodwill-impairment losses *(GIM)* and two of the coefficients on changes in these losses *(ΔGIM)* are significantly negative (See table A19).

Scale effects are expected to be less serious in return-earnings regressions compared to price-book-earnings regressions (Christie 1987, Kothari and Zimmerman 1995, Easton 1998). Still, return-earnings regressions are not entirely free from scale effects (Barth and Clinch 2009). In table 7.6 there are indications that scale effects might be a problem. Size *(lnSIZE_MV)* is positively associated with stock returns in all four regressions suggesting that firms with higher market values also have higher stock returns. In contrast to price-book-earnings regressions, there are no obvious alternative candidates that can serve as scale proxy (e.g. Christie 1987). Market values or stock prices are the apparent scale candidates as stock returns, the dependent variable in these regressions, are measured as changes in stock prices (market values), adjusted for current net dividends, over the initial stock prices (market values) for the return period. Rather than deflating all the variables with an alternative scale proxy, the unstandardised residuals from a regression of stock returns on firm size *(lnSIZE_MV)* are used as dependent variable. As demonstrated in table A20, the results in table 7.6 are mainly unaffected. Goodwill-impairment losses *(GIM)* and changes in goodwill-impairment losses *Δ(GIM)* are still negatively associated with stock returns. Moreover, the coefficient on firm size *(lnSIZE_MV)* is now insignificant. This suggests that potential scale effects do not have substantial effect on the results in table 7.6. The robustness tests demonstrate that the results in table 7.6 are driven at least to some extent by firm-year observations from the financial-recession year 2008 and firm-year observations with substantial book goodwill and/or substantial goodwill-impairment losses. Besides, the results are sensitive to the period over which stock returns are measured. With a lag of three months or more after the fiscal-year end, the coefficients on levels *(GIM)* and changes in goodwill-impairment losses *(ΔGIM)* turn insignificant in most regressions. Taken together, the results support hypothesis 1c. Goodwill-impairment losses provide information that is reflected in current stock returns. This suggests that these losses are value relevant and to some extent timely reported.

7.2.5. Value relevance of goodwill under the amortisation method

This section investigates the value relevance of goodwill-amortisation charges. The accounting numbers from 2005-2009 are adjusted as-if goodwill is reported under a method with amortisation, but no impairment testing. The results from price-book-earnings regressions for the fiscal years 2005-2009 are given in table 7.7 below. Two regression models are tested: the basic price-book-earnings model in table 6.3 and the basic model with control variables for economic growth, firm size and industry sector.

Table 7.7 Value relevance of book goodwill and amortisation charges – hypothesis 2a

		Stock price t							
		Main model				***Main model with control variables***			
		Available sample		*Non-missing*		*Available sample*		*Non-missing*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*
Intercept		2.290*** (6.21)	1.857*** (7.78)	2.280*** (6.19)	1.864*** (7.78)	-17.312** (-2.47)	-13.055*** (-3.34)	-17.596** (-2.51)	-13.325*** (-3.39)
(E+GIM)$_{i,t}$	+	3.148*** (3.52)	4.310*** (8.18)	3.176*** (3.50)	4.302*** (8.18)	2.430** (2.60)	3.666*** (7.34)	2.452** (2.60)	3.671*** (7.33)
GAM$_{i,t}$		12.839** (2.40)	5.025 (1.54)	12.783** (2.39)	4.953 (1.51)	12.843** (2.46)	10.514*** (2.96)	12.791** (2.45)	10.472*** (2.94)
(EQCA-GWCA)$_{i,t-1}$	+	0.628*** (2.69)	0.715*** (8.57)	0.636*** (2.74)	0.712*** (8.52)	0.569*** (2.61)	0.648*** (6.96)	0.577*** (2.64)	0.653*** (6.99)
GWCA$_{i,t-1}$	+	0.714* (1.90)	0.848*** (3.39)	0.715* (1.89)	0.853*** (3.40)	0.466 (1.42)	0.360 (1.51)	0.463 (1.41)	0.339 (1.43)
GROWTH_SALES$_{i,t}$						0.446** (2.04)	0.549*** (3.31)	0.445** (2.03)	0.547*** (3.29)
lnSIZE_MV$_{i,t}$						1.088*** (3.27)	0.810*** (4.27)	1.100*** (3.30)	0.831*** (4.36)
RESOURCES$_{i,t}$						-2.921 (-1.03)	-1.848 (-1.43)	-2.830 (-1.00)	-2.070 (-1.60)
GENERAL_ INDUSTRIALS$_{i,t}$						-2.878** (-2.15)	-1.740** (-2.11)	-2.859** (-2.09)	-1.894** (-2.32)
CYCLICAL_ CONSUMER_ GOODS$_{i,t}$						-3.679*** (-2.69)	-2.867*** (-3.46)	-3.663*** (-2.65)	-3.036*** (-3.73)
NON-CYCLICAL_ CONSUMER_GOODS$_{i,t}$						-1.034 (-0.60)	-0.913 (-0.92)	-1.043 (-0.60)	-0.934 (-0.93)
CYCLICAL_SERVICES$_{i,t}$						-3.553** (-2.58)	-2.322*** (-2.73)	-3.541** (-2.51)	-2.487*** (-2.93)
NON_CYCLICAL_ SERVICES$_{i,t}$						-7.448*** (-4.19)	-4.711*** (-4.48)	-7.472*** (-4.11)	-4.952*** (-4.69)
UTILITIES$_{i,t}$						-4.345** (-2.53)	-2.321** (-2.01)	-4.366** (-2.49)	-2.531** (-2.20)
INFORMATION_ TECHNOLOGY$_{i,t}$						-4.653*** (-3.38)	- 3.173*** (-3.71)	-4.629*** (-3.31)	-3.338*** (-3.91)
FINANCE$_{i,t}$						-3.013** (-2.19)	-1.929** (-2.17)	-2.985** (-2.12)	-2.084*** (-2.35)
N		767	712	762	708	767	722	762	718
F-value		22.48***	57.58***	22.77***	57.36***	11.73***	31.11***	11.88***	31.35***
Adjusted R^2		0 .476	0.577	0.474	0.575	0.537	0.640	0.536	0.640
Max VIF		3.91	3.94	3.92	3.95	5.14	5.34	5.24	5.60
Mean VIF		2.64	2.60	2.63	2.60	2.59	2.57	2.61	2.63

Stock price of firm i, time t, is dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $GAM_{i,t}$ is as-if accounted goodwill-amortisation charges of firm i, period t; $(EQCA\text{-}GWCA)_{i,t-1}$ is as-if accounted book equity reduced by as-if accounted book goodwill under the amortisation method of firm i, time t-1;$GWCA_{i,t-1}$is as-if accounted book goodwill under the amortisation method of firm i, time t-1; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, from period t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of equity-market value of firm i, time t. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector. Goodwill-amortisation charges take positive values. Regression coefficients are unstandardised. t-statistics are given in parentheses. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). Observations with Cook's distance larger than 4/n where n is total number of observations are considered as outliers.

Table 7.7 shows that most of the main variables are significantly associated with stock prices. There are some exceptions. Book goodwill *(GWCA)* is significantly associated with stock prices in four out of eight regressions and goodwill-amortisation charges *(GAM)* are significant in six out of eight regressions. Inconsistent with predictions in hypothesis 2a, goodwill-amortisation charges *(GAM)* are found to be significantly associated with stock prices. This result contradicts some earlier findings, but supports others. Jennings et al. (1996a) find some weak support for goodwill-amortisation charges reflecting value-relevant information. The charges are only value relevant in the fixed-effect versions of the regressions. In the year-by-year regressions, goodwill-amortisation charges are insignificantly associated with stock prices. More interestingly, the coefficient is positive, although insignificant in five out of seven year-by-year regressions. Similar results are reported by Huigjen (1996), Vincent (1997), Jennings et al. (2001), Petersen (2001, 2002) and Chambers (2007). Huigjen (1996) reports positive, but insignificant coefficients on goodwill-amortisation charges in most regressions. Stronger results are reported by Vincent (1997). She finds a significantly positive association between goodwill-amortisation charges and stock prices and attributes these unexpected findings to econometrical problems. Also recent studies have reported a positive association between goodwill-amortisation charges and stock prices. Chambers (2007), for instance, reports significantly positive coefficients on goodwill-amortisation charges without elaborating on these results. Others find weak support for a negative association. This is the case in the study by Henning et al. (2000). They demonstrate that some components of goodwill amortisation are negatively associated with stock prices.

By definition, goodwill-amortisation charges should reflect the systematic consumption of the cash-generating capacity of goodwill. In other words, if goodwill-amortisation charges turn out to be significantly associated with stock prices, i.e. value relevant, they should have a negative, not a positive coefficient. There are, however, at least two explanations for no associations between these charges and stock prices. One explanation is that these charges are calculated for an arbitrary amortisation period. They do not reflect the consumption of economic goodwill. They are only pure noise and should, therefore, have no associations with stock prices (e.g. Jennings et al. 1996, 2001). A different explanation is that insignificant associations are driven by econometrical problems. A positive association, however, is inconsistent with these charges reflecting economic charges or pure noise. Rather, a positive association suggests that these charges proxy some unrecognised economic value reflected in stock prices. In a setting with incomplete accounting, net earnings might proxy for asset and liability values that are not currently recognised on the balance sheet (Barth and Landsman 1995, Barth 2000). There are two reasons why economic value is kept unrecognised. Assets are often recognised at values lower than their fair values in the balance sheet. This is generally the case under historical-cost accounting and conservative accounting. Moreover, assets are kept unrecognised because they fail to meet recognition criteria for capitalisation (given balance-sheet orientation). These assets might be considered as internally-generated goodwill.

Firms with lots of hidden reserves in recognised assets and unrecognised assets might have higher economic performance, higher economic growth and fewer impairment losses in book goodwill than firms with less hidden reserves. Four variables are selected to indicate economic performance and economic growth: stock returns, return-on-assets, growth in sales and market-to-book ratios. The firm-year observations are assigned to subsamples with high, medium and low values on stock returns, return-on-assets, growth in sales or market-to-book ratios.

Firm-year observations with values that are above the third quartile of these variables are assigned to the group with high economic performance and/or high economic growth. Similarly, firm years with values below the first quartile of these variables are assigned to the group with low economic performance and/or low economic growth. The subsample with high stock returns has a significantly positive coefficient on goodwill-amortisation charges *(GAM)* (coeff. 19.555, t-value: 2.66), whereas the subsample with low stock returns has an insignificantly positive coefficient (coeff. 11.166, t-value: 1.51) (See table A21). The same pattern is found for return-on-assets. The subsample with high return-on-assets has a significantly positive coefficient on goodwill-amortisation charges *(GAM)* (coeff. 19.609, t-value: 1.70). The subsample with low return-on-assets has an insignificantly positive coefficient (coeff. 6.347, t-value: 1.44).

More striking evidence is found for growth in sales and market-to-book ratios. Firms with high growth in sales have a positively significant coefficient on goodwill-amortisation charges *(GAM)* (coeff. 21.900, t-value: 2.73). Firms with low growth in sales have an insignificantly negative coefficient (coeff. -1.545, t-value: -0.10). Market-to-book is an indicator of economic goodwill. If market-to-book ratios are higher than 1, this signifies that expected return on equity is higher than required return on equity. In contrast, if market-to-book ratios are lower than 1, this signifies that expected return on equity is lower than required return on equity. Firms assigned to the high market-to-book subsample have market-to-book ratios above three, which means that equity-market values are more than three times book-equity values. Firms assigned to the low subsample have market-to-book values lower than 1.50. These firms have an insignificantly negative coefficient on goodwill-amortisation charges *(GAM)* (coeff. -7.342, t-value:

-1.49). The coefficient on book goodwill *(GWCA)*, however, is significantly positive (coeff. 0.912, t-value: 2.50) and lower than one. This indicates that the market perception of economic goodwill per share is lower than reported book goodwill per share. For firms with high market-to-book ratios, the coefficient on goodwill-amortisation charges *(GAM)* is positive and significant (coeff. 17.865, t-value: 2.84). A significantly positive coefficient is also found on book goodwill *(GWCA)* (coeff. 2.805, t-value: 3.56). This coefficient is higher than one, which indicates that the market perception of economic goodwill per share is higher than reported book goodwill per share. Alternative cut-off points for high and low market-to-book values have no major influence on the results in table A21. The results are qualitatively unchanged if high market-to-book values are defined as values above two or above 2.5. Likewise, the results are qualitatively unchanged if low market-to-book values are defined as below 1.25, below one or below 0.75 (Results not tabulated). Moreover, the inclusion of control variables among these industry-sector dummies has no significant effect (See table A22).[30]

Similar results are found when firm-year observations are separated into those with goodwill-impairment losses and those without goodwill-impairment losses. Firms not reporting impairment losses have a highly significantly positive coefficient on goodwill-amortisation charges (coeff. 19.064, t-value: 3.08), whereas firms reporting impairment losses have an insignificant coefficient on these charges (coeff. 3.994, t-value: 0.36). Taken together, the above results suggest that goodwill-amortisation charges proxy for some economic value. The positive association between these charges and stock prices are driven by firms with high economic performance, high economic growth and/or firms not reporting impairment losses in goodwill. Goodwill-amortisation charges do not

[30] The t-statistics are not clustered at firm-level due to lack of degrees of freedom.

seem to reflect consumption of goodwill at least not on average. Rather, these charges might proxy for economic value, such as economic assets not recognised on the balance sheet. A potential candidate might be internally-generated goodwill (e.g. Senthilnathan 2009:171). Some of the results indicate, however, that goodwill-amortisation charges might reflect economic charges. This is the case for firms with low market-to-book ratios. A barely insignificantly negative coefficient is found on goodwill-amortisation charges for these firms.

Additional analysis is conducted to investigate whether accumulated goodwill-amortisation charges are positively associated with stock prices. Stock prices are regressed on net earnings less current year's goodwill amortisation, book equity less accumulated goodwill amortisation and accumulated goodwill-amortisation charges. Following Kang and Zhao (2010:236), a positive coefficient on accumulated amortisation charges is consistent with over-amortisation. Net earnings less goodwill amortisation (coeff. 2.957, t-value: 2.91. Results are not tabulated) and book equity less accumulated goodwill amortisation (coeff. 0.7603, t-value: 2.77. Resultat are not tabulated) are positively associated with stock prices. Consistent with over-amortisation, a significantly positive coefficient is found on accumulated goodwill-amortisation charges (coeff. 3.157, t-value: 2.29. Results are not tabulated). This supports the notion that goodwill amortisation reflects economic value rather than economic charges. Taken together, amortisation of goodwill does not seem to be consistent with faithful reporting of goodwill. Given that these results are unaffected by econometrical problems, they reject hypothesis 2a that goodwill-amortisation charges have no associations with stock prices.

Several robustness tests are conducted to investigate whether the results in table 7.7 are affected by observations from certain years, are driven by firms with substantial book goodwill or are sensitive to alternative time lags in stock prices. The inclusion of separate intercepts for each year (year dummies) has no major effect on the results in table 7.7 (See table A23). The only exception is the results for book goodwill *(GWCA)*. The coefficients on book goodwill are insignificantly positive in four out of eight regressions. Somewhat similar results are reported when financial-recession observations are excluded (See table A24). Goodwill-amortisation charges *(GAM)* are significantly positive in all regressions, whereas book goodwill *(GWCA)* is significantly positive in six out of eight regressions. In the remaining two regressions, book goodwill *(GWCA)* is insignificant (See table A24). The exclusion of observations with substantial book goodwill has a more material effect on the results in table 7.7 (See table A25). The coefficient on book goodwill *(GWCA)* is now insignificant in all eight regressions. The coefficient on goodwill-amortisation charges *(GAM)*, however, is still significantly positive.

In contrast to the impairment-only method, goodwill numbers under the amortisation-only method have never been reported. They are as-if accounted numbers. One general argument for collecting stock prices with time lags relative to the fiscal-year end is to ensure that the capital market has fully reflected the accounting information. This suggests no need for investigating alternative time lags in stock prices. Still, there are arguments in favour of such an investigation. Employing stock prices at the fiscal-year end must be based on the premise that all relevant information is reflected in stock prices at that time. This is not necessarily the case. The information may not be publicly available (the information is private) or it may be available, but stock prices are not fully adjusted to the available information. The latter case is inconsistent with semi-strong market efficiency. This suggests that an investigation of alternative time lags might have relevance even for as-if accounted numbers. The reason is that these numbers are supposed to or not supposed to depict economic fundamentals reflected in stock prices. The information concerning these economic fundamentals might be reflected with a time lag relative to the fiscal-year end. The results in table 7.7 are found to be rather robust to alternative time lags in stock prices. In table A26 to table A28 all the regressions are rerun with stock prices collected two, three and four months after fiscal-year end. Goodwill-amortisation charges *(GAM)* are positively associated with stock prices in 20 out of 24 regressions. Book goodwill *(GWCA)*, however, is in some regressions significant, in others barely insignificant. The significance of these coefficients is generally weaker when control variables are included.

Before drawing the conclusion that goodwill-amortisation charges are positively associated with stock prices, the results in table 7.7 must be examined for potential scale effects. Any demonstrated positive association between these charges and stock prices, can be driven by the fact that large firms with large equity-market values tend to have more book goodwill and thereby higher goodwill-amortisation charges (e.g. Lo 2005). Without sufficient correction for scale, the association between stock prices and goodwill-amortisation charges may turn positive even if the economic association is non-existent or negative. The regressions in table 7.7 (along with robustness regressions in table A23 to table A28) all demonstrate a positive association between size and stock prices. This signifies risk of scale effects. Two methods are conducted to mitigate scale effects in the regressions in table 7.7: Total assets and total sales are used as alternative scale proxies, and unstandardised residuals from a regression of stock prices on size are used as an alternative dependent variable in the price-book-earnings regressions. The regression results, with alternative scaling than number of outstanding common stocks, are reported in table A29 and table A30. The results are weaker than those reported in table 7.7 when the variables are scaled by total assets. Book equity less book goodwill *(EQCA-GWCA)* is insignificant in four out of eight regressions, whereas book goodwill *(GWCA)* is insignificant in all eight regressions (See table A29). Goodwill-amortisation charges *(GAM)* are still significantly positively associated with stock prices in all eight regressions. Size *(ln_SIZE)*, however, is insignificant, suggesting that potential scale effects are removed. Somewhat stronger results are reported when the variables are scaled by total sales (See table A30). Goodwill-amortisation charges *(GAM)* are highly positively significant. Size *(ln_SIZE)* is significantly positive in two out of four regressions, indicating that there still might be some remaining scale effects. An alternative remedy to mitigate scale effects is employed. As described previously, unstandardised residuals from a regression of stock prices on size are used as control for potential scale effects. The results from rerunning the regressions give weaker results (See table A31). Goodwill-amortisation charges *(GAM)* are still positively associated with stock prices, and book goodwill *(GWCA)* is positively significant in the main model, but turns insignificant in the model with control variables. Size *(ln_SIZE)*, however, is still associated with stock prices. This is due to the high correlation between size and the other independent variables in these regressions. When size is included as the only explanatory variable of unstandardised residuals, the coefficient is almost perfectly zero and highly insignificant (coeff. $2.91*10^{-9}$: t-value: 0.000. Results not tabulated).

A final step is to investigate the scale effect for firm-year observations with high and low values on variables for economic performance and/or economic growth. The dependent variable is, still, the unstandardised residuals from the regression of stock prices on size. For firm-year observations with high stock returns, the coefficient on goodwill-amortisation charges *(GAM)* is significantly positive (coeff. 17.201, t-value: 2.47. Results not tabulated). The coefficient, however, is insignificant for observations with low values on stock returns (coeff. 4.629, t-value: 0.73. Results not tabulated). Similar results are found when observations are split on return-on-assets. Firm-year observations with high values on return-on-assets have a significantly positive coefficient on goodwill-amortisation charges *(GAM)* (coeff. 17.360, t-value: 1.67. Results not tabulated) and an insignificant coefficient for observations with low values on return-on-assets (coeff. 3.136, t-value: 0.42. Results not tabulated). The results when the observations are split on growth in sales and market-to-book ratios are consistent with those above. High growth observations have a significantly positive coefficient on goodwill-amortisation charges *(GAM)* (coeff. 19.538, t-value: 2.83. Results not tabulated), whereas low growth observations have an insignificant coefficient (coeff. 1.661, t-value: 0.12. Results not tabulated). And finally, firm-year observations with high market-to-book ratios have a significantly positive coefficient (coeff. 15.295, t-value: 2.81. Results not tabulated), whereas firm-year observations with low market-to-book ratios have an insignificantly negative coefficient (coeff -12.985, t-value: -1.03. Results not tabulated). Taken together, scale effects do not seem to explain the positive coefficient on goodwill-amortisation charges. Rather, the positive coefficient seems to be driven by firms with high economic performance and/or growth. This indicates that goodwill-amortisation charges proxy for some economic value not recognised on the balance sheet.

Results consistent with those reported for price-book earnings regressions in table 7.7 are reported for return-earnings regressions in table 7.8 below. Two regression models are tested: the basic return-earnings model in table 6.4 and the basic model with control variables for economic growth, firm size, financial leverage and industry sector. The total available sample of observations is here identical to the non-missing sample of observations employed to test differences in adjusted R-squares.

Table 7.8 Value relevance of goodwill-amortisation charges – hypothesis 2b

		Stock return t			
		Main model		***Main model with control variables***	
		Available sample / Non-missing sample		*Available sample / Non-missing sample*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*
Intercept		-0.054	-0.073***	-1.119***	-0.924***
		(-1.57)	(-3.50)	(-3.48)	(-3.59)
$(E+GIM)_{i,t}$	+	1.704***	1.731***	1.358***	1.202***
		(3.69)	(7.83)	(3.08)	(5.00)
$\Delta(E+GIM)_{i,t,t-1}$	+	0.005	0.392**	0.130	0.447***
		(0.02)	(2.48)	(0.52)	(2.66)
$GAM_{i,t}$		2.603***	2.190***	2.817***	2.559***
		(5.28)	(5.65)	(5.61)	(7.81)
$\Delta GAM_{i,t,t-1}$		0.416	-3.890**	0.282	-0.465
		(0.33)	(-2.09)	(0.23)	(-0.58)
$GROWTH\_SALES_{i,t}$				0.010	-0.029
				(0.32)	(-0.49)
$lnSIZE\_MV_{i,t}$				0.058***	0.050***
				(3.78)	(4.09)
$LEVERAGE_{i,t-1}$				$1.15*10^{-4}$***	$9.26*10^{-4}$
				(3.29)	(-1.25)
$RESOURCES_{i,t}$				0.014	-0.054
				(0.15)	(-0.59)
$GENERAL\_ INDUSTRIALS_{i,t}$				-0.167***	-0.186***
				(-4.37)	(-5.49)
$CYCLICAL\_ CONSUMER\_ GOODS_{i,t}$				-0.151***	-0.109**
				(-2.69)	(-2.44)
$NON\text{-}CYCLICAL\_ CONSUMER\_GOODS_{i,t}$				-0.233***	-0.230***
				(-5.37)	(-5.74)
$CYCLICAL\_SERVICES_{i,t}$				-0.175***	-0.189***
				(-4.69)	(-5.13)
$NON\_CYCLICAL\_ SERVICES_{i,t}$				-0.342***	-0.271***
				(-2.81)	(-5.42)
$UTILITIES_{i,t}$				-0.255***	-0.228***
				(-4.15)	(-4.44)
$INFORMATION\_ TECHNOLOGY_{i,t}$				-0.097	-0.178***
				(-1.27)	(-3.05)
$FINANCE_{i,t}$				-0.101**	-0.137***
				(-2.31)	(-3.25)
N		762	728	762	727
F-value		12.94***	38.16***	11.91***	12.05***
Adjusted R^2		0.126	0.159	0.148	0.170
Max VIF		1.53	1.46	5.20	5.07
Mean VIF		1.27	1.23	2.09	2.04

Table continues on next page.

Table continues from previous page.
Stock return of firm i, period t, is the dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $\Delta (E+GIM)_{i,t,t-1}$ is changes in pre-impairment net earnings of firm i from period t-1 to t; $GAM_{i,t}$ is as-if accounted goodwill-amortisation charge of firm i, period t; $\Delta GAM_{i,t,t-1}$ is changes in as-if accounted goodwill-amortisation charge of firm i from period t-1 to t; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, from period t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of the equity-market value of firm i, time t; $LEVERAGE_{i,t-1}$ is debt-to-equity ratio of firm i, time t-1. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector. Goodwill-amortisation charges take positive values. Regression coefficients are unstandardised. t-statistics are given in parentheses. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). Observations with Cook's distance larger than 4/n where n is total number of observations are considered as outliers.

Table 7.8 shows that pre-impairment net earnings *(E+GIM)* and to some extent changes in pre-impairment net earnings *Δ(E+GIM)* are significantly positively associated with stock returns. Inconsistent with predictions in hypothesis 2b, goodwill-amortisation charges *(GAM)* are positively associated with stock returns. This indicates that goodwill-amortisation charges proxy for economic benefits reflected in stock returns. These benefits might be generated by unrecognised assets such as internally-generated goodwill. The results reported for return-earnings regressions when splitting the firm-year observations on high and low values of stock returns are consistent with those reported for price-book earnings regressions. For firm-year observations with high stock returns, goodwill-amortisation charges *(GAM)* have a highly significantly positive coefficient (coeff. 2.302, t-value: 5.72. Results not tabulated). For firm-year observations with low stock returns, goodwill-amortisation charges *(GAM)* have a barely insignificantly negative coefficient (coeff. -1.462, t-value: -1.63. Results not tabulated). Similar results are found when splitting firm-year observations into those with goodwill-impairment losses and those without impairment losses. The association between goodwill-amortisation charges and stock returns is significantly positive for those firms not reporting impairment losses (coeff. 3.213, t-value: 5.89. Results not tabulated), whereas the association is insignificantly negative for those firms reporting impairment losses (coeff. -1.183, t-value: -0.87. Results not tabulated).

A similar set of robustness tests are conducted here as for the price-book-earnings regressions. First, the regressions are rerun to investigate whether the results in table 7.8 are driven by firm-year observations from certain years. The inclusion of year dummies has no substantial effect on the results. Goodwill-amortisation charges *(GAM)* are still significantly associated with stock returns in three out of four regressions. Moreover, changes in these amortisation charges *(ΔGAM)* are significantly positively associated with stock returns in three out of four regressions (See table A32). The exclusion of financial-recession observations has some influence on the results. Goodwill-amortisation charges *(GAM)* are still significantly positively associated with stock returns. Changes in these charges *(ΔGAM)*, however, are insignificant (See table A33). The results in table 7.8 might be affected by firms having substantial book goodwill. However, this does not seem to be the case. An exclusion of firm-year observations with substantial book goodwill has limited effect on the results shown in table 7.8 (See table A34). Three alternative time lags are also investigated: two months, three months and four months subsequent to the fiscal-year end (See table A35 to table A37). Goodwill-amortisation charges *(GAM)* are positively associated with stock returns when these returns are measured with a time lag of two months (See table A35). When time lag is three months, the coefficients on goodwill-amortisation charges *(GAM)* are barely significant in two out of eight regressions (See table A36). For time lag of four months, none of the coefficients on amortisation charges are significant (See table A37). Changes in goodwill amortisation charges *(ΔGAM)* are in some cases significantly negatively associated in other cases insignificantly associated with stock returns (See table A35 to table A37). The last set of robustness tests conducted here investigates the risk of scale effects. As discussed previously, the positive sign of the coefficient on goodwill-amortisation charges might be driven by scale effects. In order to control for size, the unstandardised residuals from a regression of stock returns on size are used as dependent variable. As revealed in table A38, control for size has limited effect on the main results. Goodwill-amortisation charges *(GAM)* are still positively associated with stock returns. Changes in these charges *(ΔGAM)*, however, are insignificant. Size *(ln_SIZE)* is now insignificantly associated with stock returns (See table A38). In summary, the positive coefficient on goodwill amortisation is robust to a large set of additional tests. In particular, no evidence is found that the positive association between goodwill-amortisation charges, stock prices and stock returns is driven by scale effects.

7.2.6. Value relevance of goodwill under the amortisation-and-impairment method

This section investigates value relevance of goodwill numbers reported under the combined amortisation-and-impairment method. As for the amortisation-only method, the actual amortisation periods used by the firms prior to the IFRS adoption are employed to calculate the as-if accounted amortisation charges. For a careful discussion of the adjustment procedure, see section 7.2.1 above. Hypotheses 2c and 2d predict no significant associations between amortisation charges and stock prices or stock returns under a combined amortisation-and-impairment method. The results of price-book-earnings regressions and return-earnings regressions for the period 2005-2009 are given in table 7.9 and table 7.10 below.

Table 7.9 Value relevance of goodwill, amortisation charges and impairment losses –hypothesis 2c

		Stock price t							
		Main model				***Main model with control variables***			
		Available sample		*Non-missing*		*Available sample*		*Non-missing*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*
Intercept		2.218	1.877***	2.205***	1.807***	-16.393**	-11.418***	-16.681**	-11.404***
		(5.93)	(8.08)	(5.94)	(7.24)	(-2.46)	(-3.00)	(-2.51)	(-2.99)
$(E+GIM)_{i,t}$	+	3.089***	4.549***	3.120***	4.632***	2.398***	4.064***	2.421***	4.062***
		(3.64)	(8.06)	(3.63)	(7.94)	(2.77)	(7.12)	(2.78)	(7.11)
$GAMC_{i,t}$		12.665**	4.363	12.595**	9.158**	12.989**	9.439***	12.929**	9.436***
		(2.43)	(1.35)	(2.42)	(2.22)	(2.55)	(2.67)	(2.55)	(2.65)
$GIMC_{i,t}$	-	-4.488**	-2.848*** (-	-4.520**	-3.676*** (-	-3.624*	-2.380**	-3.664*	-2.389**
		(-2.04)	3.39)	(-2.04)	3.17)	(-1.78)	(-2.52)	(-1.77)	(-2.53)
$(EQCAI-GWCAI)_{i,t-1}$	+	0.694***	0.649***	0.704***	0.631***	0.616**	0.583***	0.626**	0.581***
		(2.67)	(6.45)	(2.71)	(5.49)	(2.54)	(5.41)	(2.57)	(5.38)
$GWCAI_{i,t-1}$	+	0.929**	0.907***	0.932**	0.672**	0.628*	0.429*	0.628*	0.429*
		(2.33)	(3.40)	(2.33)	(2.35)	(1.80)	(1.79)	(1.80)	(1.78)
$GROWTH\_SALES_{i,t}$						0.446**	0.531***	0.445**	0.532***
						(2.28)	(3.44)	(2.28)	(3.43)
$lnSIZE\_MV_{i,t}$						1.032***	0.728***	1.045***	0.726***
						(3.29)	(3.97)	(3.32)	(3.94)
$RESOURCES_{i,t}$						-2.489	-1.955	-2.382	-1.924
						(-0.87)	(-1.51)	(-0.83)	(-1.47)
$GENERAL\_INDUSTRIALS_{i,t}$						-2.712**	-1.767**	-2.686**	-1.742**
						(-2.09)	(-2.20)	(-2.04)	(-2.11)
$CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-3.447**	-2.796***	-3.423**	-2.775***
						(-2.52)	(-3.36)	(-2.48)	(-3.24)
$NON\text{-}CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-0.930	-0.732	-0.933	-0.706
						(-0.55)	(-0.74)	(-0.54)	(-0.70)
$CYCLICAL\_SERVICES_{i,t}$						-3.385**	-2.238***	-3.366**	-2.213**
						(-2.51)	(-2.70)	(-2.44)	(-2.59)
$NON\_CYCLICAL\_SERVICES_{i,t}$						-6.908***	-4.070***	-6.920***	-4.043***
						(-4.26)	(-4.02)	(-4.16)	(-3.88)
$UTILITIES_{i,t}$						-4.076**	-2.307**	-4.089**	-2.280*
						(-2.46)	(-2.02)	(-2.42)	(-1.96)
$INFORMATION\_TECHNOLOGY_{i,t}$						-4.477***	-3.068***	-4.443***	-3.047***
						(-3.35)	(-3.66)	(-3.27)	(-3.55)
$FINANCE_{i,t}$						-2.747**	-1.751*	-2.711*	-1.712*
						(-2.02)	(-1.95)	(-1.95)	(-1.86)
N		767	715	762	716	767	720	762	716
F-value		17.84***	46.03***	18.24***	42.45***	10.86***	28.62***	11.07***	28.39***
Adjusted R^2		0.492	0.587	0.490	0.596	0.547	0.648	0.546	0.646
Max VIF		3.97	4.09	3.97	3.94	5.16	5.34	5.26	5.46
Mean VIF		2.36	2.41	2.35	2.35	2.52	2.49	2.53	2.52

Table continues on next page.

Table continues from previous page.
Stock price of firm i, time t, is dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $GAM_{i,t}$ is as-if accounted goodwill-amortisation charges of firm i, period t; $GIMC_{i,t}$ is as-if accounted goodwill-impairment loss under the amortisation-and-impairment method of goodwill of firm i, period t; $(EQCAI\text{-}GWCAI)_{i,t-1}$ is as-if accounted book equity reduced by as-if accounted book goodwill under the amortisation-and-impairment method of firm i, time t-1;$GWCA_{i,t-1}$is as-if accounted book goodwill under the amortisation-and-impairment method of goodwill of firm i, time t-1; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, from period t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of equity-market value of firm i, time t. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector. Goodwill-impairment losses and goodwill-amortisation charges take positive values. Regression coefficients are unstandardised. t-statistics are given in parentheses. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). Observations with Cook's distance larger than 4/n where n is total number of observations are considered as outliers.

All main variables are statistically significant. Goodwill-amortisation charges *(GAMC)* have a significantly positive coefficient and goodwill-impairment losses *(GIMC)* a significantly negative coefficient. The only exception is the coefficient on goodwill-amortisation charges *(GAMC)* which is insignificant in one out of eight regressions. The results are unaffected when including control variables. As for the previous regressions investigating goodwill-amortisation charges, these results contrast with the predictions. Goodwill-amortisation charges *(GAMC)* have significantly positive coefficients, not insignificant coefficients as predicted in hypothesis 2c.

Several robustness tests are conducted to investigate whether the results are driven by firm-year observations from certain years, whether they are driven by firm-year observations with substantial book goodwill or substantial impairment losses, whether the results are sensitive to alternative time lags in stock prices and whether they are driven by potential scale effects. An inclusion of year dummies has limited effect on the result in table 7.9 (See table A39). The only exceptions are the results for goodwill-impairment losses *(GIMC)* and book goodwill *(GWCAI)*. The coefficient on goodwill-impairment losses turns insignificant in one out of eight regressions, whereas book goodwill turns insignificant in regressions with control variables. Somewhat stronger effects are found when excluding firm-year observations from the financial-recession year (See table A40). All the coefficients on goodwill-impairment losses *(GIMC)* are now insignificant, which is somewhat consistent with results reported previously (See for instance table A4). Besides, the coefficients on book goodwill are insignificant in regressions with control variables *(GWCAI)*. The exclusion of firm-year observations with substantial book goodwill, however, seems to have a stronger impact. When these observations are excluded, the coefficient on goodwill-impairment losses *(GIMC)* turns insignificant in four out of eight regressions, whereas book goodwill *(GWCAI)* is insignificant in all regressions (See table A41). When excluding large impairment losses, the coefficients on impairment losses turn insignificant in six out of eight regressions (See table A42). Surprisingly, the two coefficients that are significant have a positive, not a negative coefficient. These results are found exclusively when the regressions are run on observations without outliers.

Other robustness tests concern alternative time lags in stock price, alternative scale proxies and additional control for size. The results are affected when stock prices are collected two months after the fiscal-year end (See table A43). Book goodwill *(GWCAI)* is insignificantly associated with stock prices in regressions with control variables. Moreover, goodwill-impairment losses *(GIMC)* are either barely significant or insignificant. When time lag increases from two months to three months, the results are somewhat changed. Book goodwill *(GWCAI)* is significantly positively associated with stock prices in all regressions. Goodwill-impairment losses *(GIMC)* are significant in two out of eight regressions, whereas goodwill-amortisation charges *(GAMC)* are insignificant in four out of eight regression. In the remaining regressions, these charges are significantly positively associated with stock prices (See table A44). For time lag of four months, the results are almost similar to those reported for time lags of three months (See table A45). Alternative scale proxies have limited impact on the results in table 7.9. When the variables are scaled by total assets, coefficients on book goodwill *(GWCAI)* turn insignificant (See A46). The results for the other main variables are mainly unaffected. Scaling by total sales has no impact on the results (See table A47). Somewhat weaker results are reported when standardised residuals from a regression of stock prices on size are used as dependent variable (See table A48). Goodwill-amortisation charges *(GAMC)* have a significantly positive coefficient in all regressions, whereas goodwill-impairment losses *(GIMC)* are insignificant in two out of eight regressions. Scale effects do not seem to be the driving force behind the results in table 7.9. In sum, the above results reject hypothesis 2c that goodwill-amortisation charges are insignificantly associated with stock prices under a combined amortisation-and-impairment method.

Table 7.10 reveals the results from running the return-earnings regressions. These regressions test hypothesis 2d. The total available sample of observations is here identical to the non-missing sample of observations employed to test differences in adjusted R-squares.

Table 7.10 Value relevance of amortisation charges and impairment losses – hypothesis 2d

		Stock return t			
		Main model		***Main model with control variables***	
		Available sample / Non-missing sample		*Available sample / Non-missing sample*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive Outliers*	*Inclusive outliers*	*Exclusive outliers*
Intercept		-0.053 (-1.42)	-0.040* (-1.86)	-1.022*** (-3.43)	-0.847*** (-3.60)
$(E+GIM)_{i,t}$	+	1.696*** (3.68)	1.534*** (7.14)	1.357*** (3.11)	1.166*** (5.06)
$\Delta(E+GIM)_{i,t,t-1}$	+	-0.026 (-0.10)	0.520*** (3.16)	0.102 (0.40)	0.462*** (2.74)
$GAMC_{i,t}$		3.161*** (3.34)	1.481*** (2.80)	3.440*** (3.61)	1.987*** (3.37)
$\Delta GAMC_{i,t,t-1}$		0.518 (0.41)	-3.563* (-1.72)	0.454 (0.38)	-0.380 (-0.49)
$GIMC_{i,t}$	-	-1.571*** (-3.58)	-3.152*** (-3.94)	-1.501*** (-3.59)	-2.206** (-2.50)
$\Delta GIMC_{i,t,t-1}$	-	-0.124 (-0.89)	-0.103 (-0.61)	-0.111 (-0.79)	-0.322* (-1.73)
$GROWTH\_SALES_{i,t}$				0.005 (0.16)	-0.034 (-0.57)
$lnSIZE\_MV_{i,t}$				0.053*** (3.76)	0.047*** (4.22)
$LEVERAGE_{i,t-1}$				$1.27*10^{-4}$*** (3.50)	$-9.05*10^{-4}$ (-1.23)
$RESOURCES_{i,t}$				0.033 (0.36)	-0.049 (-0.55)
$GENERAL\_ INDUSTRIALS_{i,t}$				-0.165*** (-4.37)	-0.183*** (-5.64)
$CYCLICAL\_ CONSUMER\_ GOODS_{i,t}$				-0.151** (-2.47)	-0.107** (-2.28)
$NON\text{-}CYCLICAL\_ CONSUMER\_GOODS_{i,t}$				-0.223*** (-5.22)	-0.217*** (-5.72)
$CYCLICAL\_SERVICES_{i,t}$				-0.164*** (-4.56)	-0.176*** (-4.98)
$NON\_CYCLICAL\_ SERVICES_{i,t}$				-0.262*** (-3.07)	-0.205*** (-3.27)
$UTILITIES_{i,t}$				-0.239*** (-4.07)	-0.215*** (-4.67)
$INFORMATION\_ TECHNOLOGY_{i,t}$				-0.105 (-1.40)	-0.154*** (-2.73)
$FINANCE_{i,t}$				-0.097** (-2.18)	-0.134*** (-3.23)
N		762	727	762	724
F-value		23.15***	21.86***	13.46***	8.48***
Adjusted R^2		0.148	0.150	0.168	0.153
Max VIF		2.36	1.55	5.21	5.06
Mean VIF		1.66	1.31	2.14	1.95

Table continues on next page.

Table continues from previous page.
Stock return of firm i, period t, is dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; Δ $(E+GIM)_{i,t,t-1}$ is changes in pre-impairment net earnings of firm i from period t-1 to t; $GAMC_{i,t}$ is as-if accounted goodwill-amortisation charges under the amortisation-and-impairment method of firm i, period t; $\Delta GAMC_{i,t,t-1}$ is changes in as-if accounted goodwill-amortisation charges under the amortisation-and-impairment method of firm i from period t-1 to t; $GIMC_{i,t}$ is as-if accounted goodwill-impairment losses under the amortisation-and-impairment method of firm i, period t; $\Delta GIMC_{i,t,t-1}$ is changes in as-if accounted goodwill-impairment losses under the amortisation-and-impairment method of firm i from period t-1 to t; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, from period t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of the equity-market value of firm i, time t; $LEVERAGE_{i,t-1}$ is debt-to-equity ratio of firm i, time t-1. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, CYCLICAL_CONSUMER _$GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector.Goodwill-amortisation charges and goodwill-impairment losses take positive values in these regressions. Regression coefficients are unstandardised. t-statistics are given in parentheses.*indicates significant at 10% level (two-tailed), **indicates significant at 5 % level (two-tailed), *** indicates significant at 1% level (two-tailed). Observations having a value of Cook's distance larger than 4/n where n is total number of observations are classified as outliers.

Pre-impairment earnings *(E+GIM)*, goodwill-amortisation charges (*GAMC)* and goodwill-impairment losses *(GIMC)* are significantly associated with stock returns in all regressions. The change variables are associated with stock returns in some of the regressions run on observations without outliers. The results are inconsistent with predictions in hypothesis 2d. Goodwill-amortisation charges are predicted to be insignificantly associated, not significantly positively associated with stock returns.

A set of robustness tests are conducted. The inclusion of year-dummies has minor effect on the results in table 7.10. Goodwill-amortisation charges *(GAMC)* are positively associated with stock returns in three out of four regressions, whereas goodwill-impairment losses *(GIMC)* are negatively associated with stock returns in all four regressions (See table A49). Surprisingly, the exclusion of financial-recession observations has no significant effect on the coefficients on goodwill-impairment losses *(GIMC)* (See table A50). These coefficients are still significantly negative. The next two robustness tests exclude firm-year observations with large book goodwill or large impairment losses. Excluding observations with large book goodwill has some minor effect on the results in table 7.10 (See table A51). Goodwill-impairment losses are insignificant when regression with control variables is run on observations without outliers. However, firm-year observations with large impairment losses have a more substantial effect on the significance of the coefficients on goodwill-impairment losses (See table A52). When firm-years with large impairment losses are excluded, the coefficient on impairment losses *(GIMC)* becomes insignificant in all regressions. Alternative time lags in stock returns have some impact on the results in table 7.10 (See table A53 to table A55). The coefficients on goodwill-amortisation charges *(GAMC)* and goodwill-impairment losses *(GIMC)* become less significant as the time lag increases from two months to three and four months. And finally, a control for potential scale effects by using unstandardised residuals from a regression of stock returns on size does not significantly affect the results in table 7.10 (See table A56). Goodwill-amortisation charges *(GAMC)* are significantly positively associated with stock returns, and goodwill-impairment losses *(GIMC)* are significantly negatively associated with stock returns. Thus, the results in table 7.10 do not seem to be driven by scale effects. All in all, goodwill-amortisation charges are found to be positively associated with stock returns, which is inconsistent with predictions in hypothesis 2d. Goodwill-impairment losses are found to be negatively associated with stock returns, which suggests that these losses are incrementally value relevant to goodwill-amortisation charges.

7.2.7. Value relevance of goodwill under alternative accounting methods

Hypotheses 2e and 2f make predictions about value relevance of goodwill reported under alternative accounting methods. The hypotheses predict that goodwill numbers reported under the impairment-only method better explain variation in stock prices (stock returns) than goodwill numbers reported under the amortisation or the amortisation-and-impairment method. Four different accounting systems are investigated: no amortisation and impairment testing (permanent-retention method), impairment testing only (current IFRS-regulation), amortisation with no impairment testing and a combination of amortisation and impairment testing. The method with no amortisation and impairment testing is included for reasons of completeness. Results from price-book-earnings regressions and return-earnings regressions under this method are reported in table A57 and table A58.

Following previous value-relevance studies, adjusted R-squares are employed as overall measures of value relevance (Harris et al. 1994, Ali and Hwang 2000, Ball et al. 2003, Chambers 2007). Differences in adjusted R-squares between two competing regressions are tested by the Vuong test and by using z-tests based on bootstrapped standard errors of differences in adjusted R-squares. Both price-book-earnings regressions and return-earnings regressions are run. Robustness tests are conducted to investigate whether the main results are influenced by alternative time lags in stock prices or stock returns and potential scale effects. Table 7.11 reveals the results from testing differences in adjusted R-squares on firm-year observations for the period 2005-2009 using the Vuong test and z-tests based on bootstrapped standard errors. As these tests demand the same set of firm-year observations across regressions, the non-missing sample of 762 firm-year observations is employed in all price-book-earnings and return-earnings regressions.

Table 7.11 Value relevance of goodwill reported under alternative accounting methods – hypotheses 2e and 2f

	Price-book-earnings regressions (Stock price t)					*Return-earnings regressions (Stock return t)*				
	Adjusted R^2		*Difference in adjusted R^2*	*Vuong Z-statistics*	*Bootstrapped Z-statistics*	*Adjusted R^2*		*Difference in adjusted R^2*	*Vuong Z-statistics*	*Bootstrapped Z-statistics*
	Model 1	*Model 2*				*Model 1*	*Model 2*			
Impairment-only method versus permanent-retention method	0.480	0.438	0.042	1.908*	1.700*	0.132	0.091	0.041	1.791*	1.750*
Amortisation-only method versus permanent-retention method	0.474	0.438	0.036	1.868*	1.900*	0.126	0.091	0.035	1.459	1.470
Amortisation-and-impairment method versus permanent-retention method	0.490	0.438	0.052	2.247**	2.100**	0.148	0.091	0.057	2.330**	2.200**
Amortisation-only method versus impairment-only method	0.474	0.480	-0.006	-0.231	-0.230	0.126	0.132	-0.006	-0.289	-0.260
Amortisation-and-impairment method versus impairment-only method	0.490	0.480	0.010	1.188	1.160	0.148	0.132	0.016	1.331	1.130
Amortisation-and-impairment method versus amortisation-only method	0.490	0.474	0.016	0.816	0.810	0.148	0.126	0.022	1.706*	1.520

*indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed).

Permanent-retention method reports no goodwill-amortisation charges and goodwill-impairment losses.

The accounting method with no impairment losses or amortisation charges, the permanent-retention method, is the one providing least value-relevant information. Adjusted R-squares from this accounting system are significantly lower than adjusted R-squares from almost any other accounting system. One exception is the amortisation-only method. The adjusted R-square differences between this method and the permanent-retention method are not statistically significant when running return-earnings regressions. This result, however, is sensitive to the time lag in stock returns. With a time lag of two months subsequent to the fiscal-year end, these adjusted R-square differences are strongly significant, suggesting that the amortisation method provides more value-relevant information than the permanent-retention method (See table A 59). When time lag increases to three and four months, the differences in adjusted R-squares are generally insignificant for return-earnings models, but significant for price-book-earnings regressions (See table A60 and table A61). Taken together, these results suggest that any other method than permanent retention of book goodwill provides more value-relevant information.

The results in table 7.11, however, do not provide any order of preference concerning the other accounting methods. Almost none of the differences in adjusted R-squares are statistically significant. The only exception is the difference in adjusted R-squares between the amortisation-only method and the combined amortisation-and-impairment method. This result, however, is limited to the return-earnings regressions when testing the difference by the Vuong test. Alternative time lags in stock prices and stock returns give similar results as those reported in table 7.11 (See table A59 to table A61). There are few significant differences between adjusted R-squares for any of the accounting methods other than permanent retention. The only exceptions are between the amortisation-only method and the impairment-only method and between the amortisation-only method and the combined amortisation-and-impairment method. With a time lag of two months in stock returns, a significantly positive difference is found between the amortisation-only method and the impairment-only method (See table A59). This indicates that the amortisation-only method provides more value-relevant information than the impairment-only method. With a time lag of three and four months in stock returns, a significantly positive difference is found between the amortisation-and-impairment method and the amortisation-only method. These latter results are similar to those reported in table 7.11. They indicate that a combined method, allowing both amortisation and impairment testing, provides more value-relevant accounting numbers than a method that only allows amortisation (See table A60 and table A61). Evidence from prior sections, however, demonstrates that size is positively associated with stock prices and stock returns. This suggests that scale effects might be a problem. Two alternative remedies are employed to investigate how scale effects may impact the results in table 7.11. First, price-book-earnings regressions are rerun with all variables scaled by either total assets or total sales. Second, unstandardised residuals from a regression of either stock prices or stock returns on size are used as dependent variables. The results from scaling with total assets or total sales are reported in table A62. These results may provide some order of preference concerning the accounting methods. When the variables are scaled by total assets, there are indications that both the combined amortisation-and-impairment method and the amortisation-only method provide more value-relevant information than the impairment-only method and the permanent-retention method. The order of preference is not as evident when it comes to the amortisation-only method and the combined amortisation-and-impairment method. The differences in adjusted R-squares for these methods are insignificant. When scaling by total sales, it is possible to rank the combined amortisation-and-impairment method as the best method when it comes to explaining variation in stock prices. The adjusted R-square for this method is significantly higher than for any other method (See table A62).

As for the previous value-relevance regressions, an alternative procedure to scaling is conducted to control for potential scale effects. The unstandardised residuals from regressions of stock prices or stock returns on size are used as dependent variables. The results from these additional tests are somewhat weaker than those reported in table 7.11 (See table A63). Still, the results indicate a pattern. There are indications that accounting methods with amortisation and/or impairment testing perform better in terms of value relevance than the permanent-retention method. This result, however, is weakest for the amortisation-only method. The differences in adjusted R-squares between this method and the permanent-retention method are significant only when running price-book-earnings regressions. The Vuong test indicates significant differences, but not the bootstrapped z-test. Weak results are also found for differences between the impairment-only method and the permanent-retention method. The adjusted R-square differences are only statistically significant when running return-earnings regressions, indicating that the impairment-only method provides more value-relevant information than the permanent-retention method. The results when comparing the other accounting methods are also rather weak. Most of the adjusted R-square differences are insignificant. The only exception is the adjusted R-square difference between the combined amortisation-and-impairment method and the amortisation-only method when running return-earnings regressions. The Vuong test indicates significant differences, but not the bootstrapped z-test.

The above results do not suggest that the impairment-only method is superior to the amortisation-only or the combined amortisation-and-impairment method in terms of value relevance. Rather, some of the results indicate that an accounting method with amortisation and impairment testing provides accounting numbers that better explain variation in stock prices and stock return. This rejects hypotheses 2e and 2f. Still, this does not imply that the amortisation method (or a combined method) is better in terms of faithful representation of economic fundamentals than the impairment-only method. As demonstrated in previous sections, the amortisation charges do not seem to reflect economic charges. They rather proxy for economic value or economic benefits reflected in stock prices and stock returns. Reporting these as charges is, therefore, inconsistent with faithful reporting. Goodwill-impairment losses, however, are found to be significantly negatively associated with stock prices and stock return, which is consistent with these charges reflecting economic impairment in stock prices and stock returns. This brings support for the impairment-only method.

7.3. Empirical analysis of research question 3 and 4

This subchapter investigates the associations between goodwill-impairment losses and variables for economic impairment, earnings-management incentives and corporate-governance mechanisms. Research question three concerns associations between goodwill-impairment losses, variables for economic impairment and earnings-management incentives. Hypotheses 3a to 3al are tested in order to answer research question three. Research question four concerns associations between abnormal-impairment losses, variables for earnings-management incentives and corporate-governance mechanisms. Hypotheses 4a to 4al are tested in order to answer research question four.

7.3.1.Descriptive statistics and bivariate correlation

This section discusses descriptive statistics and bivariate correlation for variables employed in regressions investigating associations between goodwill-impairment losses, economic impairment, earnings-management incentives and/or corporate-governance mechanisms. Table 7.12, table 7.13 and table 7.14 below report descriptive statistics for these variables. The variables are included as they are specified in the regressions in chapter six. Mean values, median values and standard deviations are reported in percentages for those variables that are commonly referred to as percentages. These are signified with %. Some variables are ln-transformed when employed in the regressions. Descriptive statistics for both ln-transformed and untransformed versions of these variables are reported.

Table 7.12 Descriptive statistics on impairment losses and variables for economic impairment

	N	*Mean*	*Median*	*First quartile*	*Third quartile*	*Standard deviation*
$IMP\_DECISION_{i,t}$	1122	0.219	0	0	0	0.414
$IMP\_AMOUNT\%_{i,t}$	1121	0.422	0	0	0	2.170
$\Delta GDP\%_{i,t,t-1}$	1122	0.530	2.173	-2.002	2.685	2.777
$\Delta UNEMPLOY\%_{i,t,t-1}$	1122	0.592	0.358	0.092	0.883	0.709
$\Delta INDRET\%_{i,t,t-1}$	1122	9.214	18.003	-17.034	28.483	28.865
$\Delta INDROA\%_{i,t,t-1}$	1122	-0.238	0.071	-1.139	0.607	1.740
$RET\%_{i,t}$	1095	13.858	11.416	-19.040	36.814	54.057
$\Delta SALES\%_{i,t,t-1}$	1119	12.972	8.317	0.181	20.545	40.627
$\Delta ROA\%_{i,t,t-1}$	1078	-0.202	-0.128	-2.455	2.078	10.675
$\Delta OCF\%_{i,t,t-1}$	1120	-2.082	5.807	-22.139	38.657	1606.547
$BM_{i,t}$	1121	0.555	0.373	0.230	0.636	0.915
$DIFFBM_{i,t}$	1122	0.113	0	0	0	0.317
$HIST_{i,t}$	1122	0.185	0	0	0	0.389

$IMP\_DECISION_{i,t}$ equals 1 if firm i reports goodwill-impairment losses for period t; otherwise 0; $IMP\_AMOUNT\%_{i,t}$ is reported goodwill-impairment losses (a positive amount) of firm i period t, in percentage of total assets at time t-1; $\Delta GDP\%_{i,t,t-1}$ is average-monthly percentage changes in Gross Domestic Product of UK from period t-1 to t; $\Delta UNEMPLOY\%_{i,t,t-1}$ is average-monthly percentage changes in unemployment rates from period t-1 to t; $\Delta INDROA\%_{i,t,t-1}$ is median percentage changes in industry-sector pre-impairment return-on-assets from period t-1 to t where industry-sector is defined according to FTSE codes to which firm i belongs; $\Delta INDRET\%_{i,t,t-1}$ is median percentage changes in industry-sector stock returns from period t-1 to t where industry-sector is defined according to FTSE codes to which firm i belongs; $RET\%_{i,t}$ is percentage stock returns of firm i, period t; $\Delta SALES\%_{i,t,t-1}$ is percentage changes in total sales of firm i, from period t-1 to t; $\Delta ROA\%_{i,t,t-1}$ is percentage changes in pre-impairment return-on-assets of firm i, from period t-1 to t; $\Delta OCF\%_{i,t,t-1}$ is percentage changes in operating cash flows of firm i, from period t-1 to t; $BM_{i,t}$ is pre-impairment book-to-market ratios of firm i, time t; $DIFFBM_{i,t}$ equals 1 if pre-impairment book equity of firm i, time t, is above market value of equity, time t; otherwise 0; $HIST_{i,t}$ equals 1 if goodwill-impairment losses are reported for firm i, period t-1; otherwise 0. For binary variables, the mean value is the ratio of observations equals 1. Descriptive statistics are calculated on all available observations.

Goodwill-impairment losses (*IMP_DECISION*) are reported in 21.93% of the firm-year observations. Average impairment losses (*IMP_AMOUNT%)* comprise 0.42% of total assets. When excluding financial-recession observations from the fiscal year 2008, the percentage of firm-years with impairment losses decreases to 19.89%. Average impairment losses are now 0.27% of total assets. This is consistent with previous results, suggesting that number and size of impairment losses are affected by financial-recession observations. Changes in Gross Domestic Product *(ΔGDP%)* and changes in unemployment rates *(ΔUNEMPLOY%)* are supposed to indicate macro-economic fluctuations. Average growth in Gross Domestic Product *(ΔGDP%)* over the fiscal years[31] 2005-2009 is 0.53% (Median: 2.17%). If financial-recession observations are excluded, average growth increases to 0.87% (Median: 2.51%) for the remaining years. Average growth in unemployment rates *(ΔUNEMPLOY%)* is 0.59% (Median: 0.36%) over the fiscal years 2005-2009. Excluding the financial-recession observations has basically no influence on average changes in unemployment rates. Mean changes is still 0.60% (Median: 0.35%) for the remaining years. A substantial increase in unemployment rates are found only in the fiscal year 2009. Percentage changes in this year are 1.83% (Median: 1.93%). This suggests that the financial-recession effect on unemployment is found in 2009 rather than 2008.

Two variables of economic performance are included at the industry-sector level: median changes in industry-sector stock returns *(ΔINDRET%)* and median changes in industry-sector return-on-assets *(ΔINDROA%)*. The median is measured for industry-sector changes in stock returns and return-on-assets from period *t-1* to *t*, where industry sector is defined according to the FTSE codes (For

[31] These variables are measured over the fiscal years rather than the calendar years (See subchapter 7.1 above).

details, see section 7.1.1 above). Average changes in industry-sector stock returns *(ΔINDRET%)* is 9.21% (Median: 18.00%) over the fiscal years 2005-2009, whereas average changes in industry-sector return-on-assets *(ΔINDROA%)* is -0.24% (Median: 0.07%). These results are strongly affected by financial-recession observations. When excluding the fiscal year 2008, the average changes in industry-sector stock returns *(ΔINDRET%)* increases to 20.38% (Median: 20.80%). The same number for changes in industry-sector return-on-assets *(ΔINDROA%)* is 0.31% (Median: 0.38%).

Six variables of economic performance are included at the firm level: stock returns *(RET)*, changes in total sales *(ΔSALES%)*, changes in pre-impairment return-on-assets *(ΔROA)*, percentage changes in operating cash flows *(ΔOCF%)*, and finally, two variables based on pre-impairment book-to-market ratios *(BM, DIFFBM)*. Average stock returns *(RET%)* is 13.86% (Median 11.42%), and average changes in total sales *(ΔSALES%)* is 12.97% (Median: 8.32%), both measured over the fiscal years 2005-2009. Average changes in return-on-assets *(ΔROA%)* and operating cash flows *(ΔOCF%)* are both negative with values at -0.20% (Median: -0.13%) and -2.08% (Median: 5.81%), respectively. Changes in operating cash flows *(ΔOCF%)*, however, are strongly affected by outliers. The lowest observation of this variable is -46000.00% whereas the largest observation is 26987.31%. The distribution of this variable is also heavily left skewed. This demonstrates the need for careful investigation of outliers when running the regression models. All firm-level variables are affected by observations from the financial-recession year 2008. Average stock returns *(RET%)*, for instance, increases to 26.31% (Median: 19.68%) when observations from the financial-recession year are excluded. Similar impact can be found for the other variables. Average changes in return-on-assets *(ΔROA%)* increases to 0.81% (Median:

0.18%), and average changes in operating-cash flows *(ΔOCF%)* is 42.12% (Median: 3.63%) when excluding observations from this year.

The last two economic variables are pre-impairment book-to-market ratios *(BM)* and an indicator variable based on book-to-market ratios *(DIFFBM)*. The indicator variable equals 1 if pre-impairment book equity is higher than market value of equity. This variable is supposed to signify whether firms are in an impairment position or not. Average book-to-market ratios is 0.56 (Median: 0.37), and 11.32% of the firm-years have pre-impairment book equity higher than market value of equity *(DIFFBM)*. And finally, 18.54% of the firm-years have impairment losses in at least two subsequent years *(HIST)*.

Table 7.13 Descriptive statistics on variables for earnings-management incentives

	N	*Mean*	*Median*	*First quartile*	*Third quartile*	*Standard deviation*
$COB\_BON\%_{i,t}$	1109	3.672	0	0	0	13.089
$CEO\_BON\%_{i,t}$	1109	37.127	37.566	23.183	48.307	37.924
$CFO\_BON\%_{i,t}$	1083	34.981	36.592	23.780	46.609	21.907
$COB\_COSTOCK_{i,t}$	1061	27.762	0	0	0	899.855
$CEO\_COSTOCK_{i,t}$	1064	18.023	1.206	0.101	3.751	250.427
$CFO\_COSTOCK_{i,t}$	987	24.366	2.246	0.519	7.196	243.211
$COB\_OPTION_{i,t}$	1065	0.292	0	0	0	1.796
$CEO\_OPTION_{i,t}$	1068	17.834	0.688	$2.24*10^{-5}$	4.054	180.836
$CFO\_OPTION_{i,t}$	991	17.563	1.278	0.012	6.819	102.638
$TARGET_{i,t}$	1122	0.627	1	0	1	0.484
$BATH_{i,t}$	1122	-0.019	0	0	1	0.062
$SMOOTH_{i,t}$	1122	0.346	0	0	1	0.476
$\Delta COB_{i,t}$	1122	0.131	0	0	0	0.338
$\Delta CEO_{i,t}$	1122	0.125	0	0	0	0.335
$\Delta CFO_{i,t}$	1122	0.140	0	0	0	0.347
$DEBT_{i,t}$	1122	2.548	1.733	0.963	2.956	19.518
$lnSIZE\_MV_{i,t}$	1121	20.893	21.140	20.211	21.769	1.314
$SIZE\_MV_{i,t}$	1122	$4.87*10^{9}$	$1.21*10^{9}$	$5.99*10^{8}$	$2.87*10^{9}$	$1.28*10^{10}$

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$COB\_BON\%_{i,t}$ is cash-bonus payment to COB of firm i period t, in percentage of total cash compensation to COB period t; $CEO\_BON\%_{i,t}$ is cash-bonus payment to CEO of firm i period t, in percentage of total cash compensation to CEO period t; $CFO\_BON\%_{i,t}$ is cash-bonus payment to CFO of firm i period t, in percentage of total cash compensation to CFO period t; $COB\_COSTOCK_{i,t}$ is number of conditional stocks held by COB of firm i time t, scaled by number of common stocks held by COB at time t; $CEO\_COSTOCK_{i,t}$ is number of conditional stocks held by CEO of firm i time t, scaled by number of common stocks held by CEO at time t; $CFO\_COSTOCK_{i,t}$ is number of conditional stocks held by CFO of firm i time t, scaled by number of common stocks held by CFO at time t; $COB\_OPT_{i,t}$ is number of executive stock options held by COB of firm i time t, scaled by number of common stocks held by COB at time t; $CEO\_OPT_{i,t}$ is number of executive stock options held by CEO of firm i time t, scaled by number of common stocks held by CEO at time t; $CFO\_OPT_{i,t}$ is number of executive stock options held by CFO of firm i time t, scaled by number of common stocks held by CFO at time t; $TARGET_{i,t}$ is an indicator variable which equals 1 if pre-impairment earnings of firm i period t, is above pre-impairment earnings for firm i, period t-1; otherwise 0; $BATH_{i,t}$ is changes in pre-impairment earnings of firm i from period t-1 to t, scaled by total assets at time t-1, when below the median of nonzero negative values of this variable; otherwise 0; $SMOOTH_{i,t}$ is changes in pre-impairment earnings of firm i from period t-1 to t, scaled by total assets at time t-1, when above the median of nonzero positive values of this variable; otherwise 0; $\Delta COB_{i,t}$ equals 1 if firm i changes COB in period t; otherwise 0; $\Delta CEO_{i,t}$ equals 1 if firm i changes CEO in period t; otherwise 0; $\Delta CFO_{i,t}$ equals 1 if firm i changes CFO in period t; otherwise 0; $DEBT_{i,t}$ is pre-impairment debt-to-equity ratio of firm i, period t; $lnSIZE\_MV_{i,t}$ is natural logarithm of equity-market value of firm i time t; $SIZE\_MV_{i,t}$ is equity-market value of firm i, time t. For binary variables, the mean value is the ratio of observations equals 1.

Table 7.13 reports descriptive statistics for variables on earnings-management incentives. Four sets of variables are employed to reflect alternative incentives for overstating and/or understating impairment losses in goodwill. The first set comprises variables based on elements from the remuneration package. Three elements from this package are investigated: cash-bonus payments, conditional stocks and executive stock options. The next set of variables is supposed to reflect reporting strategies such as target accounting, big-bath accounting and smoothing. The third set comprises indicator variables for COB changes, CEO changes and CFO changes. The last set comprises two variables where each of these is supposed to reflect debt-covenant incentives and political-cost incentives.

Cash-bonus payments are a more important part of total cash compensation for CEOs *(CEO_BON%)* and CFOs *(CFO_BON%)* than COBs *(COB_BON%)*. For COBs average cash bonus constitutes only 3.67% of total cash compensation. In contrast, average cash bonus for CEO and CFO constitutes 37.13% (Median: 37.57%) and 34.98% (Median: 36.59%) of total cash compensation for each of these managers. While CEOs and CFOs receive cash bonus in 981 firm years (87.43% of total firm years) and 976 firm years (86.99% of total firm years), COBs only receive cash bonus in 105 firm years (9.36% of total firm years). The picture seems somewhat different when it comes to conditional stocks. The average COB holds 27.76 times more conditional stocks than common stocks *(COB_COSTOCK)*, whereas the average CEO has 18.02 times more conditional stocks *(CEO_COSTOCK)*. This does not mean, however, that COBs hold far more conditional stocks than CEOs. COBs hold conditional stocks in only 114 firm years (10.16% of total firm years). The same numbers for CEOs and CFOs are 953 firm years (84.94% of total firm years) and 1099 firm years (97.95% of total firm years). Moreover, in absolute terms, both CEOs and CFOs receive and hold far more conditional stocks than COBs. While CEOs hold 893 176 conditional stocks on average (Median: 389 357), the average conditional stockholding of COBs is only 96 907 stocks (median: 0).

Even more striking differences are found for executive-stock options. The average COB holds stock options which constitute 0.29 times of his common stocks *(COB_OPTION)*. CEOs and CFOs, in contrast, have stock-option holdings which constitute 17.83 times *(CEO_OPTION)* and 17.56 times *(CFO_OPTION)* their stockholdings on average. In fact COBs hold stock options in only 120 firm years (10.70% of total firm years). The same numbers are 785 firm years for CEOs (69.96% of total firm years) and 751 firm years for CFOs (66.93% of total firm years). This suggests that executive-stock options are a far more important part of total remuneration for CEOs and CFOs than for COBs. The three next variables are supposed to reflect target-accounting *(TARGET)*, big-bath accounting *(BATH)* and income-smoothing incentives *(SMOOTH)*. The mean value of the target proxy gives the percentage of pre-impairment net earnings that is higher than previous year's net earnings. 62.66% of the firm-year observations have pre-impairment earnings that are higher than last year's earnings. The big-bath proxy *(BATH)* equals changes in pre-impairment earnings when below the median of nonzero negative values of pre-impairment earnings changes. Likewise, the smoothing proxy *(SMOOTH)* equals changes in pre-impairment earnings when above the median of nonzero positive values of these earnings changes. As expected, the big-bath proxy *(BATH)* has a substantially lower mean than the smoothing proxy *(SMOOTH)*. Changes in top-management positions are covered by three indicator variables *(ΔCOB, ΔCEO, ΔCFO)*. The frequency in top-management changes is rather constant across the three top-management positions. Around 12-14% of the firm years have changes in at least one of these three positions. The last two variables are supposed to reflect debt-covenant incentives *(DEBT)* indicated by debt-to-equity ratios and political-cost incentives indicated by firm size *(lnSIZE_MV)*. The debt-covenant variable equals pre-impairment debt-to-equity ratios at the end of the fiscal year. Book value of debt is 2.55 times larger than pre-impairment book equity for the average firm. And finally, the average market value among the sample firms is $4.87*10^9$ British Pounds (£) *(SIZE_MV)*.

Table 7.14 Descriptive statistics on variables for corporate-governance mechanisms

	N	*Mean*	*Median*	*Frist quartile*	*Third quartile*	*Standard deviation*
$BOARD\_SIZE_{i,t}$	1122	9.337	9	8	11	2.505
$lnBOARD\_SIZE_{i,t}$	1122	2.200	2.197	2.079	2.398	0.257
$NONEXE\%_{i,t}$	1121	50.769	50	42.857	57.143	11.942
$BOARD\_MEET_{i,t}$	1121	8.712	8	7	10	2.765
$lnBOARD\_MEET_{i,t}$	1121	2.114	2.079	1.946	2.303	0.326
$COB\_STOCK\%_{i,t}$	1121	1.821	0.017	0.004	0.091	8.08
$CEO\_STOCK\%_{i,t}$	1119	2.353	0.078	0.021	0.310	16.333
$CFO\_STOCK\%_{i,t}$	1119	0.122	0.018	0.003	0.061	0.566
$ACCEXP_{i,t}$	1122	0.767	1	1	1	0.423
$AUDIT\_SIZE_{i,t}$	1120	3.709	4	3	4	0.935
$lnAUDIT\_SIZE_{i,t}$	1120	1.282	1.386	1.099	1.386	0.239
$AUDIT\_MEET_{i,t}$	1119	4.134	4	3	5	1.456
$lnAUDIT\_MEET_{i,t}$	1119	1.366	1.386	1.099	1.609	0.324
$BLOCK\%_{i,t}$	1107	25.916	23.200	12.250	35.900	18.19
$BLOCK\_NUM_{i,t}$	1106	2.618	3	1	2	1.591
$lnBLOCK\_NUM_{i,t}$	1020	0.900	1.099	0.693	1.386	0.557
$CROSS_{i,t}$	1122	0.112	0	0	0	0.316

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$BOARD\_SIZE_{i,t}$ is number of board members of firm i time t; $lnBOARD\_SIZE_{i,t}$ is natural logarithm of number of board members of firm i time t; $NONEXE\%_{i,t}$ is number of independent non-executive directors in percentage of total number of board members of firm i time t; $BOARD\_MEET_{i,t}$ is number of board meetings of firm i time t; $lnBOARD\_MEET_{i,t}$ is natural logarithm of number of board meetings of firm i time t; $COB\_STOCK\%_{i,t}$ is number of common stocks held by COB of firm i time t, in percentage of outstanding common stocks of firm i time t; $CEO\_STOCK\%_{i,t}$ is number of common stocks held by CEO of firm i time t, in percentage of outstanding common stocks of firm i time t; $CFO\_STOCK\%_{i,t}$ is the number of common stocks held by CFO of firm i time t, in percentage of outstanding common stocks of firm i time t; $ACCEXP_{i,t}$ equals 1 if firm i time t has at least one audit-committee member being financial-accounting expert; otherwise 0; $AUDIT\_SIZE_{i,t}$ is number of audit-committee members of firm i time t; $lnAUDIT\_SIZE_{i,t}$ is natural logarithm of number of audit-committee members of firm i time t; $AUDIT\_MEET_{i,t}$ is number of audit-committee meetings of firm i time t; $lnAUDIT\_MEET_{i,t}$ is natural logarithm of number of audit-committee meetings of firm i time t; $BLOCK\%_{i,t}$ is cumulative percentage of outstanding common stocks held by blockholders owning at least 5% of outstanding common stocks of firm i time t; $BLOCK\_NUM_{i,t}$ is number of blockholders owning at least 5% of outstanding stocks of firm i time t; $lnBLOCK\_NUM_{i,t}$ is natural logarithm of number of blockholders owning at least 5% of outstanding stocks of firm i time t; $CROSS_{i,t}$ equals 1 if firm i is cross-listed on the New York Stock Exchange or the NASDAQ Stock Exchange time t; otherwise 0. For binary variables, the mean value is the ratio of observations equals 1. Descriptive statistics are calculated on all available observations.

Table 7.14 reports descriptive statistics for variables on corporate-governance mechanisms. Some of these variables are ln-transformed and their descriptive statistics may have little interest except from providing information on their distribution qualities. For these variables, the descriptive statistics for untransformed versions are referred to here. Number of board members *(BOARD_SIZE)* ranges from five to 20 (Not tabulated) (Standard deviation: 2.51) with a median of nine members (Mean: 9.34). Independent non-executive directors *(NONEXE%)* constitute on average at least half of the board (Mean: 50.77%, Median: 50.00%) and the median annual number of board meetings is eight (Mean: 8.71). The average stockholdings of COBs and CEOs constitute around 2% of total common stocks *(COB_STOCKS%, CEO_STOCKS%)* and around 0.1% for CFOs *(CFO_STOCKS%)*. Median values of these stockholdings, however, are much smaller, suggesting that the distributions are positively skewed. 76.7% of the audit committees have financial-accounting experts *(ACCEXP)*. Moreover, number of audit-committee members *(AUDIT_SIZE)* ranges from two to eight members (Results not tabulated) (Standard deviation: 0.94) with a median of four members (Mean: 3.71). Median size of the audit committees is, therefore, less than half of the median size of the boards. Like for the board, audit-committee activity is measured by number of meetings *(AUDIT_MEET)*. The median firm has four audit-committee meetings (Mean: 4.13), which equals the half of the number of board meetings. The last three variables are supposed to measure corporate governance, as reflected by blockholders *(BLOCK%, BLOCK_NUM)* and cross-listing *(CROSS)*. Average cumulative percentage of blockholdings is 25.92% (Median: 23.20%). Moreover, the median firm has three blockholders (Mean: 2.62). And finally, 11.23% of the firms are listed on either the New York Stock Exchange or the NASDAQ Stock Exchange.

Table 7.15, table 7.16 and table 7.17 below report Pearson and Spearman correlations between goodwill-impairment losses, variables for economic impairment, earnings-management incentives and corporate-governance mechanisms.

Table 7.15 Correlations between impairment losses and economic variables

Spearman(Top) and Pearson (Bottom) correlations

	$IMP\_DECISION_{i,t}$	$IMP\_AMOUNT_{i,t}$	$\Delta GDP_{i,t,t-1}$	$\Delta UNEMPLOY\%_{i,t,t-1}$	$\Delta INDROA_{i,t,t-1}$	$\Delta INDRET_{i,t,t-1}$	$RET_{i,t}$	$\Delta SALES\%_{i,t,t-1}$	$\Delta ROA_{i,t,t-1}$	$\Delta OCF\%_{i,t,t-1}$	$BM_{i,t}$	$DIFFBM_{i,t}$	$HIST_{i,t}$
$IMP\_DECISION_{i,t}$	1.000	0.990***	-0.047	0.057*	-0.062**	-0.053*	-0.103***	-0.110***	-0.064**	-0.079***	0.137***	0.149***	0.369***
$IMP\_AMOUNT_{i,t}$	0.367***	1.000	-0.061**	0.065**	-0.075**	-0.066**	-0.121***	-0.113***	-0.071**	-0.080***	0.149***	0.171***	0.354***
$\Delta GDP_{i,t,t-1}$	-0.038	-0.035	1.000	-0.558***	0.378***	-0.091**	0.048	0.189***	0.192***	-0.0003	-0.226***	-0.187***	0.005
$\Delta UNEMPLOY\%_{i,t,t-1}$	0.041	0.017	-0.875***	1.000	-0.094***	0.415***	0.270***	-0.214***	-0.076**	-0.025	0.078**	0.038	0.031
$\Delta INDROA_{i,t,t-1}$	-0.114***	-0.072**	0.308***	-0.099***	1.000	0.425***	0.372***	-0.012	0.387***	0.002	-0.221***	-0.210***	0.045
$\Delta INDRET_{i,t,t-1}$	-0.049*	-0.094***	-0.204***	0.461***	0.450***	1.000	0.690***	-0.164***	0.152***	-0.034	-0.150***	-0.187***	0.087***
$RET_{i,t}$	-0.118***	-0.134***	-0.160***	0.312***	0.238***	0.589***	1.000	-0.044	0.237***	0.062**	-0.281***	-0.284***	0.080**
$\Delta SALES\%_{i,t,t-1}$	-0.072**	-0.024	0.140***	-0.152***	0.049	-0.047	0.025	1.000	0.049	0.367***	-0.105***	-0.100***	-0.134***
$\Delta ROA_{i,t,t-1}$	-0.052**	-0.023	0.085***	-0.029	0.253***	0.125***	0.142***	0.019	1.000	0.078**	-0.131***	-0.123***	-0.013
$\Delta OCF\%_{i,t,t-1}$	-0.056*	-0.009	0.042	-0.023	0.116***	0.061**	0.040	0.050	0.078**	1.000	-0.063**	-0.036	0.002
$BM_{i,t}$	0.167***	0.258***	-0.106***	0.009	-0.170***	-0.179***	-0.230***	-0.040	-0.090***	-0.028	1.000	0.549***	0.050
$DIFFBM_{i,t}$	0.151***	0.207***	-0.151***	0.046	-0.228***	-0.209***	-0.221***	-0.026	-0.085***	-0.077***	0.552***	1.000	0.074**
$HIST_{i,t}$	0.368***	0.125***	-0.018	0.050*	0.029	0.084***	0.074**	-0.097***	-0.017	0.006	0.017	0.076**	1.000

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$IMP\_DECISION_{i,t}$ equals 1 if firm i reports goodwill-impairment losses for period t; otherwise 0; $IMP\_AMOUNT_{i,t}$ is reported goodwill-impairment losses (a positive amount) of firm i, period t, scaled by total assets at time t-1; $\Delta GDP_{i,t,t-1}$ is average-monthly changes in Gross Domestic Product of UK from period t-1 to t; $\Delta UNEMPLOY\%_{i,t,t-1}$ is average-monthly percentage changes in unemployment rates from period t-1 to t; $\Delta INDROA_{i,t,t-1}$ is median changes in industry-sector pre-impairment return-on-assets from period t-1 to t where industry-sector is defined according to FTSE codes to which firm i belongs; $\Delta INDRET_{i,t,t-1}$ is median changes in industry-sector stock returns from period t-1 to t where industry-sector is defined according to FTSE codes to which firm i belongs; $RET_{i,t}$ is stock returns of firm i, period t; $\Delta SALES\%_{i,t,t-1}$ is percentage changes in total sales of firm i, from period t-1 to t; $\Delta ROA_{i,t,t-1}$ is changes in pre-impairment return-on-assets of firm i, from period t-1 to t; $\Delta OCF\%_{i,t,t-1}$ is percentage changes in operating cash flows of firm i, from period t-1 to t; $BM_{i,t}$ is pre-impairment book-to-market ratios of firm i, time t; $DIFFBM_{i,t}$ equals 1 if pre-impairment book equity of firm i, time t, is above market value of equity, time t; otherwise 0; $HIST_{i,t}$ equals 1 if goodwill-impairment losses are reported for firm i, period t-1; otherwise 0.

*indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). Correlation coefficients are estimated on all available observations.

Table 7.15 reports correlations between impairment decisions *(IMP_DECISION)*, size of impairment losses *(IMP_AMOUNT)* and economic variables for impairment. All correlations are estimated on observations for the fiscal years 2005-2009. Pearson correlations between impairment decisions *(IMP_DECISION)* and economic variables are in most cases significant with their predicted signs. The results are even stronger for Spearman correlations. All these correlations are statistically significant and with their predicted signs. The only exception is changes in Gross Domestic Product *(ΔGDP)* which are insignificantly correlated with impairment decisions *(IMP_DECISION)*. The indicated negative association, however, is consistent with predictions. Percentage changes in unemployment rates *(ΔUNEMPLOY%)* are positively correlated with the decision to report impairment losses *(IMP_DECISION)*. This is as predicted. Higher unemployment rates indicate overall economic decline, which probably will have a negative impact on economic performance at the firm level, which leads to the recognition of more impairment losses. The result is, however, rather weak since only the Spearman-correlation coefficient, not the Pearson-correlation coefficient is statistically significant. Impairment decisions are also correlated with economic variables at industry-sector level and at firm level. As predicted, changes in industry-specific return-on-assets *(ΔINDROA)* and industry-sector stock returns *(ΔINDRET)* are negatively correlated with impairment decisions *(IMP_DECISION)*. Both Pearson and Spearman-correlation coefficients are statistically significant. This suggests that impairment losses are more likely to be reported in industry sectors suffering from impaired return-on-assets and impaired stock returns.

Also consistent with predictions, firm-specific stock returns *(RET)*, percentage changes in total sales *(ΔSALES%)*, changes in return-on-assets *(ΔROA)* and percentage changes in operating cash flows *(ΔOCF%)* are all negatively correlated with impairment decisions *(IMP_DECISION)*. As for industry-sector variables, both Pearson and Spearman correlations are statistically significant. The likelihood of impairment losses is, therefore, higher in firms with impaired economic performance. This result holds for market-based, accounting-based and cash-based measures of firm performance. Impairment decisions *(IMP_DECISION)* are also significantly correlated with book-to-market variables *(BM, DIFFBM)*. As predicted, book-to-market ratios *(BM)* and book-to-market indicators *(DIFFBM)* are significantly positively correlated with impairment decisions *(IMP_DECISION)*. Both Pearson and Spearman correlations are statistically significant. The higher the pre-impairment book-to-market ratios, the more likely is the recognition of impairment losses. Consistent with predictions, a positive Pearson and Spearman correlation are found between impairment losses the previous year *(HIST)* and recognition of impairment losses the current year *(IMP_DECISION)*. This is consistent with previous findings that impairment losses are reported in a sequence over several years.

The economic variables are also significantly correlated with size of impairment losses *(IMP_AMOUNT)*. Impairment losses increase in economic variables indicating impaired economic performance. This result holds for variables at macro-economic level, industry-sector level and firm level. Both Pearson and Spearman correlations have predicted signs, but the results for Pearson correlations are somewhat weaker. The correlations between macro-economic variables, changes in Gross Domestic Product *(ΔGDP)* and percentage changes in unemployment rates *(ΔUNEMPLOY%)*, and size of impairment losses *(IMP_AMOUNT)*, are insignificant for Pearson correlations, but significant and with predicted signs for Spearman correlations. As predicted, impaired industry-sector return-on-assets *(ΔINDROA)* and industry-sector stock returns *(ΔINDRET)* are negatively correlated with size of impairment losses *(IMP_AMOUNT)*. Both Pearson and Spearman correlations are statistically significant. As for industry-sector variables, stock returns *(RET)* have significantly negative Pearson and Spearman correlations. Somewhat weaker results are reported for correlations between accounting-based performance measures, cash-based performance measures *(ΔSALES%, ΔROA, ΔOCF%)* and size of impairment losses *(IMP_AMOUNT)*. All these correlations have negative signs as predicted, but only Spearman correlations are statistically significant. Book-to-market variables *(BM, DIFFBM)* have positive Pearson and Spearman correlations as predicted. And finally, impairment losses the previous year *(HIST)* increase size of impairment losses the current year. This is demonstrated by positively significant Pearson and Spearman correlations.

There are also some significant correlations between pairs of economic variables. Some of these correlations are unexpected and should be commented. The correlation between changes in Gross Domestic Product *(ΔGDP)* and changes in industry-sector stock returns *(ΔINDRET)* should be significantly positive, not significantly negative. The same results are found for correlations between changes in Gross Domestic Product *(ΔGDP)* and stock returns *(RET)*. These are also significantly negative, not significantly positive as expected. Some unexpected correlations between percentage changes in unemployment rates *(ΔUNEMPLOY%)*, changes in industry-sector stock returns *(ΔINDRET)* and stock returns *(RET)* are also found. These are expected to be negative, not positive. One possible reason for these unexpected correlations could be that economic decline is reflected in macro-economic variables such as Gross Domestic Product and unemployment rates with a time lag relative to stock-based performance measures.

Additional, not tabulated, evidence supports this argument. If stock returns are measured over the previous fiscal year, the correlation between changes in Gross Domestic Product *(ΔGDP)* and stock returns *(RET)* is significantly positive (Pearson-coeff. 0.564, p-value: 0.000) as expected. Expected correlations are also revealed between percentage changes in unemployment rates *(ΔUNEMPLOY%)* and stock returns *(RET)* (Pearson-coeff. -0.490, p-value 0.000).

Table 7.16 Correlations between impairment losses and earnings-management variables

Spearman(Top) and Pearson (Bottom) correlations

	$IMP\_DECISION_{i,t}$	$IMP\_AMOUNT_{i,t}$	$COB\_BON_{i,t}$	$CEO\_BON_{i,t}$	$CFO\_BON_{i,t}$	$COB\_COSTOCK_{i,t}$	$CEO\_COSTOCK_{i,t}$	$CFO\_COSTOCK_{i,t}$	$COB\_OPTION_{i,t}$	$CEO\_OPTION_{i,t}$	$CFO\_OPTION_{i,t}$
$IMP\_DECISION_{i,t}$	1.000	0.990***	0.053	-0.042	-0.093***	0.007	0.007	-0.013	0.037	0.011	0.017
$IMP\_AMOUNT_{i,t}$	0.367***	1.000	0.051	-0.055*	-0.112***	0.006	0.012	-0.010	0.036	0.020	0.029
$COB\_BON_{i,t}$	0.034	-0.008	1.000	0.084**	0.041	0.422***	-0.211***	-0.165***	0.473***	-0.038	0.012
$CEO\_BON_{i,t}$	-0.006	-0.069**	0.243***	1.000	0.867***	0.007	0.025	0.048*	0.025	0.070**	0.051
$CFO\_BON_{i,t}$	-0.084***	-0.139***	0.124***	0.397***	1.000	0.007	-0.002	0.039	0.028	0.063*	0.043
$COB\_COSTOCK_{i,t}$	0.057*	0.649***	-0.009	-0.003	-0.049	1.000	0.017	0.031	0.664***	0.069**	0.081**
$CEO\_COSTOCK_{i,t}$	-0.005	-0.009	0.048	-0.003	-0.004	0.002	1.000	0.644***	-0.067**	0.321***	0.151***
$CFO\_COSTOCK_{i,t}$	-0.037	-0.013	-0.020	0.011	0.029	-0.003	0.007	1.000	-0.039	0.178***	0.202***
$COB\_OPTION_{i,t}$	-0.048	-0.006	0.051*	0.014	0.032	-0.004	-0.001	-0.003	1.000	0.109***	0.166***
$CEO\_OPTION_{i,t}$	-0.021	-0.014	0.196***	0.034	0.038	0.005	0.283***	0.022	0.015	1.000	0.670***
$CFO\_OPTION_{i,t}$	0.019	0.144***	-0.022	0.024	0.034	-0.005	-0.003	0.247***	0.043	0.043	1.000
$TARGET_{i,t}$	-0.103***	-0.104***	0.034	0.143***	0.204***	-0.040	-0.035	0.006	0.040	0.040	0.043
$BATH_{i,t}$	-0.078***	-0.052*	0.020	0.098***	0.110***	0.010	-0.012	0.002	0.035	0.026	0.027
$SMOOTH_{i,t}$	-0.055*	-0.029	0.054*	0.079***	0.085***	-0.022	-0.003	0.035	0.018	0.092***	0.029
$\Delta COB_{i,t}$	-0.027	-0.017	-0.020	-0.020	-0.013	-0.012	0.005	-0.011	0.035	-0.028	-0.003
$\Delta CEO_{i,t}$	0.048	0.032	0.031	-0.026	-0.007	-0.012	-0.018	0.042	-0.052*	-0.015	0.006
$\Delta CFO_{i,t}$	0.041	0.057*	0.008	0.012	-0.021	0.076**	-0.021	-0.001	-0.024	-0.012	0.018
$DEBT_{i,t}$	0.047	0.002	-0.004	0.028	0.055*	-0.003	-0.005	0.003	0.002	-0.017	-0.020
$lnSIZE\_MV_{i,t}$	0.107***	-0.013	-0.090***	0.104***	0.210***	0.001	0.071**	0.061*	0.004	-0.003	-0.010

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Spearman(Top) and Pearson (Bottom) correlations

	$TARGET_{i,t}$	$BATH_{i,t}$	$SMOOTH_{i,t}$	$\Delta COB_{i,t}$	$\Delta CEO_{i,t}$	$\Delta CFO_{i,t}$	$DEBT_{i,t}$	$lnSIZE(MV)_{i,t}$
$IMP\_DECISION_{i,t}$	-0.094***	-0.106***	-0.035	-0.016	0.058*	0.016	0.064*	0.056*
$IMP\_AMOUNT_{i,t}$	-0.105***	-0.112***	-0.037	-0.014	0.065*	0.013	0.052	0.040*
$COB\_BON_{i,t}$	0.030	-0.011	0.023	-0.039	0.051	0.039	0.032	-0.110***
$CEO\_BON_{i,t}$	0.230***	0.220***	0.117***	-0.023**	0.017	-0.018	0.085**	0.266***
$CFO\_BON_{i,t}$	0.223***	0.197***	0.084***	-0.014	0.016	-0.015	0.089***	0.265***
$COB\_COSTOCK_{i,t}$	0.054	0.024	0.007	0.013	-0.073**	0.024	0.117***	-0.045
$CEO\_COSTOCK_{i,t}$	-0.050	-0.011	-0.047	0.039	-0.026	-0.009	0.022	0.228***
$CFO\_COSTOCK_{i,t}$	-0.009	-0.021	-0.056*	0.019	-0.025	-0.051	0.008	0.200***
$COB\_OPTION_{i,t}$	0.005	-0.013	-0.016	0.014	-0.067**	-0.004	0.109***	-0.071**
$CEO\_OPTION_{i,t}$	0.046	0.073**	0.001	0.018	-0.004	-0.013	0.024	0.178***
$CFO\_OPTION_{i,t}$	0.078	0.099***	0.024*	-0.006	0.018	-0.015	0.019	0.150***
$TARGET_{i,t}$	1.000	0.614***	0.433***	-0.021	-0.032	0.013	0.042	0.050
$BATH_{i,t}$	0.400***	1.000	0.324***	0.004	-0.025	0.021	0.048	0.071**
$SMOOTH_{i,t}$	0.441***	0.225***	1.000	-0.022	0.017	0.031	-0.101***	-0.015
$\Delta COB_{i,t}$	-0.039	0.006	-0.016	1.000	0.064*	0.030	-0.058*	0.031
$\Delta CEO_{i,t}$	-0.026	-0.041	0.009	0.077***	1.000	0.077**	0.006	0.041
$\Delta CFO_{i,t}$	-0.034	-0.033	-0.007	0.057*	0.065**	1.000	-0.003	-0.027
$DEBT_{i,t}$	-0.010	0.052*	-0.017	-0.028	0.036	0.036*	1.000	0.069*
$lnSIZE\_MV_{i,t}$	0.053*	0.065**	-0.006	0.026	0.038	-0.024	0.050*	1.000

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$IMP\_DECISION_{i,t}$ equals 1 if firm i reports goodwill-impairment losses for period t; otherwise 0; $IMP\_AMOUNT_{i,t}$ is reported goodwill-impairment losses (a positive amount) of firm i, period t, scaled by total assets at time t-1; $COB\_BON_{i,t}$ is cash-bonus payment to COB of firm i period t, scaled by total cash compensation to COB period t; $CEO\_BON_{i,t}$ is cash-bonus payment to CEO of firm i period t, scaled by total cash compensation to CEO period t; $CFO\_BON_{i,t}$ is cash-bonus payment to CFO of firm i period t, scaled by total cash compensation to CFO period t; $COB\_COSTOCK_{i,t}$ is number of conditional stocks held by COB of firm i time t, scaled by number of common stocks held by COB at time t; $CEO\_COSTOCK_{i,t}$ is number of conditional stocks held by CEO of firm i time t, scaled by number of common stocks held by CEO at time t; $CFO\_COSTOCK_{i,t}$ is number of conditional stocks held by CFO of firm i time t, scaled by number of common stocks held by CFO at time t; $COB\_OPT_{i,t}$ is number of executive stock options held by COB of firm i time t, scaled by number of common stocks held by COB at time t; $CEO\_OPT_{i,t}$ is number of executive stock options held by CEO of firm i time t, scaled by number of common stocks held by CEO at time t; $CFO\_OPT_{i,t}$ is number of executive stock options held by CFO of firm i time t, scaled by number of common stocks held by CFO at time t; $TARGET_{i,t}$ is an indicator variable which equals 1 if pre-impairment earnings of firm i period t, is above pre-impairment earnings for firm i, period t-1; otherwise 0; $BATH_{i,t}$ is changes in pre-impairment earnings of firm i from period t-1 to t, scaled by total assets at time t-1, when below the median of nonzero negative values of this variable; otherwise 0; $SMOOTH_{i,t}$ is changes in pre-impairment earnings of firm i from period t-1 to t, scaled by total assets at time t-1, when above the median of nonzero positive values of this variable; otherwise 0; $\Delta COB_{i,t}$ equals 1 if firm i changes COB in period t; otherwise 0; $\Delta CEO_{i,t}$ equals 1 if firm i changes CEO in period t; otherwise 0; $\Delta CFO_{i,t}$ equals 1 if firm i changes CFO in period t; otherwise 0; $DEBT_{i,t}$ is pre-impairment debt-to-equity ratio of firm i, period t; $\ln SIZE\_MV_{i,t}$ is natural logarithm of equity-market value of firm i time t. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). Correlation coefficients are estimated on all available observations.

Table 7.16 reports correlations between impairment decisions *(IMP_DECISION)*, size of impairment losses *(IMP_AMOUNT)* and variables for earnings-management incentives. All the correlations are estimated on observations for the fiscal years 2005-2009. Some of the correlations are as predicted, others are not. CFO cash-bonus payments *(CFO_BON)* are negatively correlated with impairment decisions *(IMP_DECISION)*. Both Pearson and Spearman correlations are statistically significant. The higher the cash-bonus payments, the lower the probability of impairment losses, which is consistent with predictions. The correlations between conditional stocks, executive-stock options and impairment decisions are mainly insignificant. Some weak evidence is found for a positive correlation between COB conditional stocks *(COB_COSTOCK)* and impairment decisions *(IMP_DECISION)* which is inconsistent with predictions. This result, however, is only limited to Pearson correlations as Spearman correlations are insignificant. Unpredicted negative correlations are also found between target proxy *(TARGET)*, smoothing proxy *(SMOOTH)* and impairment decisions *(IMP_DECISION)*. A negative correlation between target proxy *(TARGET)* and impairment decisions *(IMP_DECISION)* suggests that pre-impairment earnings above previous year's pre-impairment earnings are associated with fewer, not more impairment losses. Similarly, a negative correlation between smoothing proxy *(SMOOTH)* and impairment decisions *(IMP_DECISION)* suggests that large positive fluctuations in pre-impairment earnings are associated with fewer, not more impairment losses. Both results are inconsistent with predictions. The negative correlation between big-bath proxy *(BATH)* and impairment decisions *(IMP_DECISION)*, however, is as predicted. The more pre-impairment net earnings fall, the more likely are impairment losses.

Also consistent with predictions is the positive correlation between CEO changes *(ΔCEO)* and impairment decisions *(IMP_DECISION)*. This result, however, is rather weak since only Spearman correlations are statistically significant. The Pearson correlation between pre-impairment debt-to-equity ratios *(DEBT)* and impairment decisions *(IMP_DECISION)* is insignificant. The Spearman correlation, however, is significantly positive, which is inconsistent with predictions. A negative, not a positive coefficient is expected between this variable and the decision to report impairment losses. One possible explanation might be that highly leveraged firms suffer from low economic performance, which leads to the recognition of more, not fewer impairment losses. If this is the case, impairment losses are faithfully reported rather than being the result of earnings management. This is further investigated in the next section. Consistent with predictions, a positive Pearson and Spearman correlation are found between firm size *(lnSIZE_MV)* and impairment decisions *(IMP_DECISION)*. This suggests that larger firms, measured by their equity-market values, report more impairment losses.

CEO cash-bonus payments *(CEO_BON)* and CFO cash-bonus payments *(CFO_BON)* are negatively correlated with size of impairment losses *(IMP_AMOUNT)*. This is consistent with predictions. Both Pearson and Spearman correlations are statistically significant. COB conditional stocks *(COB_COSTOCK)* and CFO stock options *(CFO_OPTION)* are positively correlated with size of impairment losses *(IMP_AMOUNT)*, which is inconsistent with predictions. Also unpredicted, the target proxy (*TARGET)* is found to be negatively, not positively correlated with size of impairment losses *(IMP_AMOUNT)*. Big-bath proxy *(BATH)* is also found to have a negative correlation. This result, however, is consistent with predictions. Positive correlations, consistent with predictions, are also found between CEO changes *(ΔCEO)*, CFO changes *(ΔCFO)* and size of impairment losses *(IMP_AMOUNT)*. The Spearman-correlation coefficient is significant for CEO changes, whereas the Pearson-correlation coefficient is significant for CFO changes. And finally, firm size *(lnSIZE_MV)* is significantly positively correlated with size of impairment losses *(IMP_AMOUNT)*.

There are also some significant correlations between pairs of variables for earnings-management incentives. Some of these correlations should be commented. COB cash-bonus payments, CEO cash-bonus payments and CFO cash-bonus payments *(COB_BON, CEO_BON, CFO_BON)* are significantly positively correlated. The only exception is the insignificant Spearman correlation between COB and CFO cash-bonus payments *(COB_BON, CFO_BON)*. The significantly positive correlations make sense since most of the firms use the same bonus targets when determining cash-bonus payments to COBs, CEOs or CFOs. The most common targets are earnings before taxes (EBT), earnings before interest and taxes, (EBIT), earnings before interest, taxes and amortisation (EBITA) or earnings-per-share. Significantly positive Pearson and Spearman correlations are also found between bonus payments to CEOs *(CEO_BON)* and CFOs *(CFO_BON)* and the target proxy *(TARGET)*, big-bath proxy *(BATH)* and smoothing proxy *(SMOOTH)*. Higher net pre-impairment earnings are associated with more cash-bonus payments. This explains the positive correlation between these variables. There are also some positive correlations between CEO and CFO conditional stocks *(CEO_COSTOCK, CFO_COSTOCK)* and CEO and CFO stock options *(CEO_OPTION, CFO_OPTION)*. The targets trigging conditional-stock awards and stock-option awards are generally a combined earnings target and stock-return target. Strong associations are also indicated between CEO and CFO stock options *(CEO_OPTION, CFO_OPTION)*, big-bath proxy *(BATH)* and smoothing proxy *(SMOOTH)*. There is also some evidence suggesting that cash-bonus payments, conditional stocks and stock options are more important parts of top managers' remuneration package in larger firms than in smaller firms. CEO and CFO cash-bonus payments (*CEO_BON, CFO_BON)* increase with firm size *(lnSIZE_MV)*. Similar results are found for the other elements of the remuneration package. Larger firms tend to rely more heavily on conditional stocks *(CEO_COSTOCK, CFO_COSTOCK)* and stock options *(CEO_OPTION, CFO_OPTION)* as part of the remuneration of CEOs and CFOs than smaller firms.

Table 7.17 Correlations between impairment losses and corporate-governance variables

Spearman(Top) and Pearson (Bottom) correlations

	$IMP\_DECISION_{i,t}$	$IMP\_AMOUNTi_{,t}$	$lnBOARD\_SIZE_{i,t}$	$NONEXE_{i,t}$	$lnBOARD\_MEET_{i,t}$	$COB\_STOCK_{i,t}$	$CEO\_STOCK_{i,t}$	$CFO\_STOCK_{i,t}$	$ACCEXP_{i,t}$	$lnAUDIT\_SIZE_{i,t}$
$IMP\_DECISION_{i,t}$	1.000	0.990***	0.144***	0.042	0.013	-0.022	-0.068**	-0.012	-0.008	-0.028
$IMP\_AMOUNT_{i,t}$	0.367 ***	1.000	0.133***	0.049	0.024	-0.017	-0.075**	-0.015	0.002	0.029
$lnBOARD\_SIZE_{i,t}$	0.165***	0.029	1.000	-0.060*	-0.168***	-0.161***	-0.194***	-0.211***	-0.057*	0.429***
$NONEXE_{,t}$	0.051*	0.080***	-0.033	1.000	0.074**	-0.274***	-0.235***	-0.154***	-0.052***	0.243***
$lnBOARD\_MEET_{i,t}$	0.021	0.050*	-0.098***	0.088***	1.000	-0.133***	-0.154***	-0.063***	0.079**	0.000
$COB\_STOCK_{i,t}$	0.034	-0.010	-0.041	-0.126***	-0.191***	1.000	0.383***	0.210***	0.042	-0.166***
$CEO\_STOCK_{i,t}$	-0.038	0.001	-0.064**	-0.032***	-0.070**	0.070**	1.000	0.393***	0.099***	-0.217***
$CFO\_STOCK_{i,t}$	-0.045	-0.023	-0.033	-0.091***	0.025	0.200***	0.079***	1.000	0.010***	-0.196***
$ACCEXP_{i,t}$	-0.029	-0.007	-0.059**	-0.001	0.082***	-0.076**	0.011	0.016	1.000	0.098***
$lnAUDIT\_SIZE_{i,t}$	0.030	0.036	0.431***	0.299***	0.028	-0.115***	-0.042	-0.091***	0.115***	1.000
$lnAUDIT\_MEET_{i,t}$	0.131***	0.072**	0.308***	0.252***	0.264***	-0.091***	-0.065**	-0.061**	0.027	0.270***
$BLOCK\%_{i,t}$	0.008	0.063**	-0.116***	-0.097***	-0.082***	0.167***	0.080***	0.043	0.082***	-0.143***
$lnBLOCK\_NUM_{i,t}$	-0.094***	-0.002	-0.262***	-0.010	0.053*	-0.014	-0.005	0.106***	0.123***	-0.153***
$CROSS_{i,t}$	0.119***	0.061**	0.369***	0.324***	-0.014	-0.044	-0.048	-0.019	-0.045	0.265***

Table continues on next page.

Table continues from previous page.

Spearman(Top) and Pearson (Bottom) correlations

	$lnAUDIT\_MEET_{i,t}$	$BLOCK\%_{i,t}$	$lnBLOCK\_NUM_{i,t}$	$CROSS_{i,t}$
$IMP\_DECISION_{i,t}$	0.138***	-0.006	-0.100***	0.103***
$IMP\_AMOUNT_{i,t}$	0.142***	0.006	-0.084***	0.101***
$lnBOARD\_SIZE_{i,t}$	0.269***	-0.140***	-0.243***	0.284***
$NONEXE_{i,t}$	0.210***	-0.035	0.001	0.276***
$lnBOARD\_MEET_{i,t}$	0.178**	-0.020	0.049	-0.046
$COB\_STOCK_{i,t}$	-0.186***	0.238***	0.211***	-0.211***
$CEO\_STOCK_{i,t}$	-0.212***	0.130***	0.123***	-0.264***
$CFO\_STOCK_{i,t}$	-0.207***	0.058**	0.170***	-0.166***
$ACCEXP_{i,t}$	0.052*	0.063**	0.118***	-0.067**
$lnAUDIT\_SIZE_{i,t}$	0.263***	-0.137***	-0.133***	0.226***
$lnAUDIT\_MEET_{i,t}$	1.000	-0.066**	-0.104***	0.328***
$BLOCK\%_{i,t}$	-0.093***	1.000	0.687***	-0.256***
$lnBLOCK\_NUM_{i,t}$	-0.096***	0.564***	1.000	-0.265***
$CROSS_{i,t}$	0.353***	-0.281***	-0.277***	1.000

$IMP\_DECISION_{i,t}$ equals 1 if firm i reports goodwill-impairment losses for period t; otherwise 0; $IMP\_AMOUNT_{i,t}$ is reported goodwill-impairment losses (a positive amount) of firm i, period t, scaled by total assets at time t-1; $lnBOARD\_SIZE_{i,t}$ is natural logarithm of number of board members of firm i time t; $NONEXE_{i,t}$ is number of independent non-executive directors in firm i time t, scaled by total number of board members of firm i time t; $lnBOARD\_MEET_{i,t}$ is natural logarithm of number of board meetings of firm i time t; $COB\_STOCK_{i,t}$ is number of common stocks held by COB of firm i time t, scaled by total number of outstanding common stocks of firm i time t; $CEO\_STOCK_{i,t}$ is number of common stocks held by CEO of firm i time t, scaled by total number of outstanding common stocks of firm i time t; $CFO\_STOCK_{i,t}$ is number of common stocks held by CFO of firm i time t, scaled by total number of outstanding common stocks of firm i time t; $ACCEXP_{i,t}$ equals 1 if firm i time t has at least one audit-committee member being financial-accounting expert; otherwise 0; $lnAUDIT\_SIZE_{i,t}$ is natural logarithm of number of audit-committee members of firm i time t; $lnAUDIT\_MEET_{i,t}$ is natural logarithm of number of audit-committee meetings of firm i time t; $BLOCK\%_{i,t}$ is cumulative percentage of outstanding common stocks held by blockholders owning at least 5% of outstanding common stocks of firm i time t; $lnBLOCK\_NUM_{i,t}$ is natural logarithm of number of blockholders owning at least 5% of outstanding stocks of firm i time t; $CROSS_{i,t}$ equals 1 if firm i is cross-listed on the New York Stock Exchange or the NASDAQ Stock Exchange time t; otherwise 0. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). Correlation coefficients are estimated on all available observations.

Table 7.17 reports correlations between impairment decisions *(IMP_DECISION)*, size of impairment losses *(IMP_AMOUNT)* and variables for corporate-governance mechanisms. Number of board members *(lnBOARD_SIZE)* and ratio of independent non-executive board members *(NONEXE)* are significantly positively correlated with impairment decisions *(IMP_DECISION)*. Only the Pearson correlation is significant for independent non-executive board members *(NONEXE)*.

This suggests that firms with larger boards and more independent board members generally report more impairment losses than firms with smaller boards and fewer independent board members. COB, CEO and CFO stockholdings *(COB_STOCK, CEO_STOCK, CFO_STOCK)*, however, are not significantly correlated with impairment decisions *(IMP_DECISION)*. The only exception is CEO stockholdings *(CEO_STOCK)* which are negatively correlated with impairment decisions. This result is limited to the Spearman correlation. Number of audit-committee members *(lnAUDIT_SIZE)*, audit-committee activity *(lnAUDIT_MEET)* and financial-accounting expertise *(ACCEXP)* on the audit committee are supposed to be important indicators of corporate governance. Only one of these variables is found to be significantly correlated with impairment decisions and that is audit-committee activity. This suggests that audit-committee size *(lnAUDIT_SIZE)* and financial-accounting expertise *(ACCEXP)* have no associations with impairment decisions. Audit-committee activity *(lnAUDIT_MEET)*, however, is found to be positively correlated with impairment decisions *(IMP_DECISION)*. This indicates that firms with more audit-committee activity report more impairment losses than firms with less audit-committee activity. Number of blockholders *(lnBLOCK_NUM)* and impairment decisions *(IMP_DECISION)* are found to be negatively correlated. This suggests that firms with more blockholders are inclined to report more impairment losses. A positive correlation, however, is found between cross-listing on either the New York Stock Exchange or the NASDAQ Stock Exchange *(CROSS)* and impairment decisions *(IMP_DECISION)*. A cross-listed firm is, therefore, inclined to report more impairment losses.

Somewhat similar results are found for size of impairment losses *(IMP_AMOUNT)*. Board size *(lnBOARD_SIZE)*, ratio of independent non-executive board members *(NONEXE)* and board activity *(lnBOARD_MEET)* are positively correlated with size of impairment losses *(IMP_AMOUNT)*. Board size *(lnBOARD_SIZE)* has significant Spearman correlation, whereas ratio of independent non-executive board members *(NONEXE)* and board activity *(lnBOARD_MEET)* have significant Pearson correlations. COB, CEO and CFO stockholdings *(COB_STOCK, CEO_STOCK, CFO_STOCK)* are not significantly correlated with size of impairment losses *(IMP_AMOUNT)* except CEO stockholdings *(CEO_STOCK)* which have a negative Spearman correlation. Among the audit-committee characteristics, the only variable with significant correlation is audit-committee activity *(lnAUDIT_MEET)*. Both Pearson and Spearman correlations are significant. Cumulative percentage of blockholdings *(BLOCK%)* is positively correlated with size of impairment losses (Pearson correlation), whereas number of blockholders *(lnBLOCK_NUM)* is negatively correlated with size of impairment losses *(IMP_AMOUNT)* (Spearman correlation). A closer investigation reveals that the positive correlation between cumulative percentage of blockholdings *(BLOCK%)* and size of impairment losses *(IMP_AMOUNT)* is driven by firms with very large cumulative blockholdings. The correlation between a variable which equals cumulative blockholdings if below 50% of common stocks and otherwise zero, and size of impairment losses, is highly insignificant (Pearson-coeff. 0.010, p-value: 0.728. Results not tabulated). In contrast, the correlation between a variable which equals cumulative blockholdings if above 50% of common stocks and otherwise zero, and size of impairment losses, is positive and significant (Pearson-coeff. 0.054, p-value 0.075. Results not tabulated). And finally, positive Pearson and Spearman correlations are found between cross-listing *(CROSS)* and size of impairment losses *(IMP_AMOUNT)*.

Taken together, this suggests that firms with stronger corporate-governance structures as indicated by more independent non-executive directors *(NONEXE)*, more audit-committee activity *(lnAUDIT_MEET)* and cross-listing *(CROSS)* report more and larger impairment losses *(IMP_DECISION, IMP_AMOUNT)* relative to firms with weaker corporate-governance structures. There are also indications that firms with larger boards *(lnBOARD_SIZE)* report more and larger impairment losses *(IMP_DECISION, IMP_AMOUNT)*, and firms with more board activity *(lnBOARD_MEET)* report larger impairment losses *(IMP_AMOUNT)*. Moreover, firms with a higher number of blockholders report fewer and smaller impairment losses. The cumulative percentage of blockholdings *(BLOCK%)*, however, has a positive correlation with size of impairment losses *(IMP_AMOUNT)*. This positive correlation is driven by firms with large cumulative blockholdings.

There are also significant correlations between some of the corporate-governance variables. Board size *(lnBOARD_SIZE)* and audit-committee size *(lnAUDIT_SIZE)* is positively correlated. Both Pearson and Spearman correlations are statistically significant. A positive correlation makes sense since the audit committee is a sub-committee of the board. A larger board will probably have more members in the audit committee. Board activity *(lnBOARD_MEET)* is negatively correlated with board size *(lnBOARD_SIZE)*. One possible explanation is that larger boards generally have more committees to help performing the board activities. Another possible explanation is that more board members simply make it more difficult to schedule frequent meetings.

A positive correlation is found between audit-committee activity *(lnAUDIT_MEET)* and audit-committee size *(lnAUDIT_SIZE)*, suggesting that larger audit committees have more, not fewer meetings. Moreover, the ratio of independent non-executive directors *(NONEXE)* is negatively correlated with board size *(lnBOARD_SIZE)*, suggesting that larger boards on average have fewer independent directors. One possible explanation for the negative correlation between board size *(lnBOARD_SIZE)* and independent directors *(NONEXE)* might be that independent directors are harder to recruit to board positions than individuals that already are affiliated to the firm. The negative correlation also indicates that board size is not necessarily explained by the need of more independent directors. Rather, board size seems to be driven by firm size since the correlation between board size *(lnBOARD_SIZE)* and firm size *(lnSIZE_MV)* is highly positively significant (Pearson-coeff. 0.527, p-value: 0.000. Results not tabulated). The ratio of independent non-executive directors *(NONEXE)* is found to be positively correlated with audit-committee size *(lnAUDIT_SIZE)*. This makes sense since audit committees generally have independent non-executive directors.

COB, CEO and CFO stockholdings *(COB_STOCK, CEO_STOCK, CFO_STOCK)* are all negatively correlated with ratio of independent non-executive directors *(NONEXE)*, board activity *(lnBOARD_MEET)*, audit-committee size *(lnAUDIT_SIZE)* and audit-committee activity *(lnAUDIT_MEET)*. All the Spearman correlations are statistically significant, but only some of the Pearson correlations. This result suggests that firms with top managers holding more stocks on average have weaker board structures. In contrast, cross-listed firms have on average stronger board structures signified by positive Pearson and Spearman correlations between cross-listing *(CROSS)*, ratio of independent non-executive directors *(NONEXE)*, audit-committee size *(lnAUDIT_SIZE)* and audit-committee activity *(lnAUDIT_MEET)*.

7.3.2. Goodwill-impairment losses, economic impairment and earnings-management incentives

This section investigates associations between goodwill-impairment losses and variables for economic impairment and earnings-management incentives (e.g. Francis et al. 1996, Riedl 2004). As no causal relationships can be established, caution should be taken when interpreting the results. Both explanatory variables for impairment decisions *(IMP_DECISION)* and size of impairment losses *(IMP_AMOUNT)* are investigated. The dependent variable, impairment decisions *(IMP_DECISION)*, equals 1 for reported impairment losses and 0 otherwise. Regressions with binary dependent variables must be estimated by using other regression models than linear-parameter models with ordinary-least square estimation techniques. A preferable choice is the logit-regression model. This model is non-linear in its parameters and based on maximum-likelihood estimation. The dependent variable, size of impairment losses *(IMP_AMOUNT)*, is censored at zero, which makes the tobit-regression model the preferred choice. Arguments for the choice of the logit and the tobit-regression model are given in subchapter 6.3 above.

Two alternative sets of explanatory variables are included. The first set comprises variables for economic impairment, whereas the second set comprises variables for economic impairment and earnings-management incentives. The regressions are run on observations for the fiscal years 2005-2009. To investigate the effect of outliers, additional regressions are run on variables winsorised at 5^{th} and 95^{th} percentile (e.g. Lang et al. 2003, Christensen, Lee and Walker 2008, Barth et al. 2008). Some variables are continuous for observations below zero *(BATH)* or above zero *(SMOOTH)*. These are either winsorised at 5^{th} percentile (continuous below zero) or winsorised at 95^{th} percentile (continuous above zero). To reduce the impact of heteroscedasticity and time dependency, standard errors are White-adjusted (White 1980) and clustered at firm level (Rogers 1993, Hoechle 2007, Petersen 2009).

Some of the explanatory variables are strongly positively correlated, which may lead to multicollinearity problems and unreliable regression results. As reported in table 7.15, changes in Gross Domestic Product *(ΔGDP)* and percentage changes in unemployment rates *(ΔUNEMPLOY%)* are strongly negatively correlated (Pearson-coeff. -0.875, p-value: 0.000). Strong positive correlations are found between median changes in industry-sector stock returns *(ΔINDRET)* and stock returns *(RET)* (Pearson-coeff. 0.589, p-value: 0.000) and between pre-impairment book-to-market ratios *(BM)* and the pre-impairment book-to-market indicator *(DIFFBM)* (Pearson-coeff. 0.552, p-value: 0.000). Strong correlations are also found between some of the earnings-management incentive variables (See table 7.16). Pearson-correlation between target proxy *(TARGET)* and big-bath proxy *(BATH)* is 0.400 (p-value: 0.000). A similar correlation is revealed between target proxy *(TARGET)* and smoothing proxy *(SMOOTH)* (Pearson-coeff. 0.441, p-value: 0.000). Strong correlations are also found between some of the variables for economic impairment and earnings-management incentives (Not tabulated). This is the case for correlations between changes in pre-impairment return-on-assets (*ΔROA)* and target proxy *(TARGET)* (Pearson-coeff. 0.461, p-value: 0.000), between changes in pre-impairment return-on-assets (*ΔROA)* and big-bath proxy *(BATH)* (Pearson-coeff. 0.627, p-value: 0.000), and finally, between changes in pre-impairment return-on-assets (*ΔROA)* and smoothing proxy (Pearson-coeff. 0.428: p-value: 0.000). To mitigate serious problems of multicollinearity, it is necessary to leave out some of the explanatory variables in the below regressions. The decision to leave out variables for multicollinearity reasons, however, must be weighed against the risk of leaving out important explanatory variables from the regressions. All explanatory variables are included with reference to prior literature. This implies that variables should not be excluded mechanically.

There are two variables that are supposed to reflect macro-economic fluctuations: changes in Gross Domestic Product *(ΔGDP)* and percentage changes in unemployment rates *(ΔUNEMPLOY%)*. These variables are closely related, which is demonstrated by a very strong positive correlation. Leaving out one of these two variables will probably not affect the explanatory power of the regressions. Based on this argument and the risk of multicollinearity, changes in Gross Domestic Product *(ΔGDP)* are excluded, which means that table 7.18 below will lack test results for hypotheses 3a and 3b. When changes in Gross Domestic Product *(ΔGDP)* are included rather than percentage changes in unemployment rates *(ΔUNEMPLOY%)*, an insignificantly negative association is found between this variable and impairment decisions *(IMP_DECISION)* (t-value: -0.54) and size of impairment losses *(IMP_AMOUNT)* (t-value: -0.76), which suggests that hypotheses 3a and 3b should be rejected. These results are from regressions run on explanatory variables listed in table 7.18 exclusive percentage changes in unemployment rates *(ΔUNEMPLOY%)* (Results are not tabulated).

Changes in industry-sector stock returns *(ΔINDRET)* and stock returns *(RET)* are also strongly correlated. At the industry-sector level, there are two variables: changes in industry-sector stock returns *(ΔINDRET)* and changes in industry-sector return-on-assets *(ΔINDROA)*. These serve two different purposes. Changes in industry-sector stock returns *(ΔINDRET)* are supposed to reflect market-based return-on-equity at the industry-sector level, whereas changes in industry-sector return-on-assets *(ΔINDROA)* are supposed to reflect accounting-based return-on-assets at this level. The strong correlation between changes in industry-sector stock returns *(ΔINDRET)* and firm-stock returns *(RET)* signifies that these two variables share almost the same information. Taken together with potential multicollinearity problems, this suggests that one of these two variables should be excluded. At the margin, it is reasonable to believe that firm-stock returns *(RET)* are a more important indicator of economic impairment in goodwill than changes in industry-sector stock returns *(ΔINDRET)*, which implies that industry-sector stock returns should be excluded from the below regressions. This means that table 7.18 below lacks test results for hypotheses 3g and 3h. If changes in industry-sector stock returns *(ΔINDRET)* are included rather than firm-stock returns *(RET)*, an insignificantly negative association is found between this variable and impairment decisions *(IMP_DECISION)* (t-value: -0.54) and size of impairment losses *(IMP_AMOUNT)* (t-value: -0.83). These results are from regressions run with explanatory variables listed in table 7.18 exclusive firm-stock returns *(RET)* (Results are not tabulated). The above results suggest that hypotheses 3g and 3h should be rejected.

Strong correlations are also revealed between pre-impairment book-to-market ratios *(BM)* and the pre-impairment book-to-market indicator variable *(DIFFBM)*. The indicator variable equals 1 if pre-impairment book equity is higher than market value of equity. This suggests that the pre-impairment book-to-market ratios *(BM)* and the indicator variable *(DIFFBM)* share almost the same information. As pre-impairment book-to-market *(BM)* is a continuous variable, not a binary variable, this variable is chosen. Regressions including the indicator variable *(DIFFBM)* rather than the pre-impairment book-to-market ratios *(BM)*, reveal an insignificantly positive association between this variable and impairment decisions *(IMP_DECISION)* (t-value: 1.45) and size of impairment losses (t-value: 1.17). These results are found when the regressions are run with explanatory variables in table 7.18 exclusive pre-impairment book-to-market ratios *(BM)* (Results are not tabulated).

The target proxy *(TARGET)* is strongly correlated with the other reporting-strategy variables *(BATH, SMOOTH)*. This variable is a crude proxy for target-accounting incentives. The variable equals 1 when pre-impairment net earnings the current year is above previous year's net earnings. The big-bath proxy *(BATH)* and the smoothing proxy *(SMOOTH)* are believed to be better at reflecting earnings-management incentives to overstate impairment losses, which suggests that the target proxy *(TARGET)* rather than the two other proxies *(BATH, SMOOTH)* should be excluded from the below regressions. If the target proxy *(TARGET)* is included rather than the two other reporting-strategy variables *(BATH, SMOOTH)*, an insignificantly negative association is revealed between this variable and impairment decisions *(IMP_DECISION)* (t-value: -0.33) and size of impairment losses *(IMP_AMOUNT)* (t-value: -0.40). These results are found when the regressions are run with explanatory variables in table 7.18 exclusive the big-bath proxy *(BATH)* and the smoothing proxy *(SMOOTH)* (Results are not tabulated). The above results suggest that hypotheses 3aa and 3ab should be rejected.

And finally, some strong correlations are also revealed between changes in pre-impairment return-on-assets (*ΔROA)* and reporting-strategy variables *(TARGET, BATH, SMOOTH)*. At the firm level, there are five (six)[32] variables for firm-specific economic performance. There are two market-based proxies *(RET, BM)*, two accounting-based proxies (*ΔSALES%, ΔROA)* and one cash-based proxy *(ΔOCF%)*. Each of the two accounting-based proxies (*ΔSALES%, ΔROA)* is believed to provide unique economic information. Percentage changes in total sales (*ΔSALES%)* are supposed to measure changes in gross-recoverability from one year to another, whereas changes in return-on-assets (*ΔROA)* are supposed to measure changes in net performance on assets from one year to another. This suggests that each of these variables is important as proxies for economic performance and should be included in the below regressions.

Regressions in table 7.18 below are run with and without winsorised variables. Two sets of explanatory variables are included: variables for economic impairment, and variables for economic impairment and earnings-management incentives. The below discussion will emphasise results from regressions including variables for both economic impairment and earnings-management incentives.

[32] It is debatable whether a sequence of impairment losses indicates economic impairment or earnings management.

Table 7.18 Goodwill-impairment losses, economic impairment and earnings-management incentives – hypotheses 3c to 3al[33]

		Impairment-decision				*Size of impairment losses*			
		Economic		*Economic and EM*		*Economic*		*Economic and EM*	
Test variables	*Pred*	*Non-winsorised*	*Winsorised*	*Non-winsorised*	*Winsorised*	*Non-winsorised*	*Winsorised*	*Non-winsorised*	*Winsorised*
Intercept		-2.051***	-2.036***	-6.517***	-6.508***	-0.065***	-0.016***	-0.119***	-0.033**
		(-15.02)	(-12.42)	(-4.18)	(-3.81)	(-4.77)	(-9.57)	(-3.32)	(-2.83)
$\Delta UNEMPLOY\%_{i,t,t-1}$	+	0.177	0.155	0.273*	0.223	0.006**	0.002**	0.007**	0.003**
		(1.54)	(1.29)	(1.94)	(1.56)	(2.03)	(2.18)	(2.49)	(2.47)
$\Delta INDROA_{i,t,t-1}$	-	-9.646*	-4.949	-10.11*	-7.398	-0.154	-0.029	-0.109	-0.044
		(-1.91)	(-0.65)	(-1.77)	(-0.85)	(-1.21)	(-0.58)	(-1.27)	(-0.88)
$RET_{i,t}$	-	-0.698***	-0.875***	-0.710***	-0.759***	-0.024***	-0.008***	-0.017***	-0.007***
		(-3.42)	(-3.44)	(-2.97)	(-2.62)	(-2.93)	(-4.05)	(-3.50)	(-3.82)
$\Delta SALES\%_{i,t,t-1}$	-	-0.002	-0.006	-0.005	-0.006	$-3.31*10^{-5}$	$-5.02*10^{-5}$	$-1.56*10^{-4}$*	$-6.31*10^{-5}$*
		(-0.68)	(-1.24)	(-1.15)	(-1.15)	(-0.38)	(-1.45)	(-1.75)	(-1.73)
$\Delta ROA_{i,t,t-1}$	-	0.171	-0.455	0.228	1.169	0.015	0.004	0.007	0.004
		(0.18)	(-0.26)	(0.19)	(0.31)	(0.50)	(0.31)	(0.32)	(0.18)
$\Delta OCF\%_{i,t,t-1}$	-	$-1.53*10^{-4}$	-0.002	$-1.13*10^{-4}$*	-0.002*	$-7.67*10^{-7}$**	$-1.00*10^{-5}$	$-5.78*10^{-7}$***	$-1.36*10^{-5}$
		(-0.91)	(-1.41)	(-1.88)	(-1.67)	(-2.63)	(-1.17)	(-2.77)	(-1.53)
$BM_{i,t}$	+	0.323**	0.554*	0.417***	0.792***	0.010***	0.005***	0.008***	0.005***
		(2.93)	(2.45)	(3.29)	(2.76)	(3.19)	(2.82)	(3.24)	(2.70)
$HIST_{i,t}$	+	2.064***	2.014***	2.108***	2.040***	0.049***	0.012***	0.033***	0.0120***
		(10.46)	(10.04)	(9.07)	(8.66)	(4.19)	(8.22)	(6.50)	(7.68)
$COB\_BON_{i,t}$	-			1.604**	1.733			0.029**	0.012
				(2.47)	(1.38)			(2.16)	(1.43)
$CEO\_BON_{i,t}$	-			0.277	2.819***			0.004	0.020**
				(1.01)	(2.63)			(1.45)	(3.04)
$CFO\_BON_{i,t}$	-			-1.214*	-3.714***			-0.038***	-0.029***
				(-1.89)	(-3.18)			(-2.84)	(-4.14)
$COB\_COSTOCK_{i,t}$	-			-0.450	-0.459			-0.005	-0.011
				(-1.40)	(-0.25)			(-0.71)	(-0.85)
$CEO\_COSTOCK_{i,t}$	-			$-2.11*10^{-5}$	0.010			$-9.52*10^{-7}$	$8.02*10^{-5}$
				(-0.52)	(0.37)			(-0.92)	(0.48)
$CFO\_COSTOCK_{i,t}$	-			-0.003	-0.016			$-7.32*10^{-5}$**	$-5.34*10^{-5}$
				(-1.12)	(-1.34)			(-2.15)	(-0.66)
$COB\_OPTION_{i,t}$	-			-0.154	-0.080			-0.007	$9.60*10^{-4}$
				(-1.53)	(-0.11)			(-1.28)	(0.18)
$CEO\_OPTION_{i,t}$	-			0.003	-0.018			$2.02*10^{-5}$	$-8.82*10^{-5}$
				(1.09)	(-0.87)			(1.01)	(-0.60)
$CFO\_OPTION_{i,t}$	-			0.002**	0.009			$8.56*10^{-5}$***	$8.88*10^{-5}$
				(2.15)	(1.03)			(3.28)	(1.47)
$BATH_{i,t}$	-			-0.134	-5.537			0.011	-0.017
				(-0.07)	(-1.07)			(0.33)	(-0.51)
$SMOOTH_{i,t}$	+			0.259	0.230			0.008*	0.002
				(1.08)	(0.80)			(1.71)	(1.29)
$\Delta COB_{i,t}$	+			-0.584*	-0.488			-0.009*	-0.003
				(-1.69)	(-1.46)			(-1.69)	(-1.51)
$\Delta CEO_{i,t}$	+			0.303	0.322			0.007	0.003
				(1.04)	(1.07)			(1.56)	(1.61)
$\Delta CFO_{i,t}$	+			0.111	-0.004			0.002	$-3.20*10^{-4}$
				(0.37)	(-0.01)			(0.36)	(-0.18)
$DEBT_{i,t}$	-			0.006	0.120***			$1.07*10^{-4}$	$5.79*10^{-4}$**
				(0.64)	(2.77)			(1.12)	(2.24)
$lnSIZE\_MV_{i,t}$	+			0.209***	0.196**			0.004**	$8.99*10^{-4}$*
				(2.93)	(2.57)			(2.46)	(1.77)

Table continues on next page.

[33] No test results are provided for hypotheses 3a and 3b, 3g and 3h, and 3aa and 3ab.

Table continues from previous page.								
N	1068	1068	869	869	1068	1068	869	869
Log-likelihood	-475.347	-481.598	-364.102	-370.240	122.079	408.981	192.989	363.601
Wald Chi2-test	149.35***	154.43***	181.49***	173.82***	3.28***	13.97***	4.56***	6.09***
Pseudo R^2	0.161	0.149	0.209	0.195	-1.929	-0.226	-1.359	-0.318
Max VIF	1.29	1.51	1.85	4.36	1.29	1.51	1.85	4.36
Mean VIF	1.11	1.24	1.24	1.79	1.11	1.24	1.24	1.79

$IMP\_DECISION_{i,t}$ equals 1 if firm i reports goodwill-impairment losses for period t; otherwise 0; $IMP\_AMOUNT_{i,t}$ is reported goodwill-impairment losses (a positive amount) of firm i, period t, scaled by total assets at time t-1; $\Delta UNEMPLOY\%_{i,t,t-1}$ is average-monthly percentage changes in unemployment rates from period t-1 to t; $\Delta INDROA_{i,t,t-1}$ is median changes in industry-sector pre-impairment return-on-assets from period t-1 to t where industry-sector is defined according to FTSE codes to which firm i belongs; $RET_{i,t}$ is stock returns of firm i, period t; $\Delta SALES\%_{i,t,t-1}$ is percentage changes in total sales of firm i, from period t-1 to t; $\Delta ROA_{i,t,t-1}$ is changes in pre-impairment return-on-assets of firm i, from period t-1 to t; $\Delta OCF\%_{i,t,t-1}$ is percentage changes in operating cash flows of firm i, from period t-1 to t; $BM_{i,t}$ is pre-impairment book-to-market ratios of firm i, time t; $HIST_{i,t}$ equals 1 if goodwill-impairment losses are reported for firm i, period t-1; otherwise 0; $COB\_BON_{i,t}$ is cash-bonus payment to COB of firm i period t, scaled by total cash compensation to COB period t; $CEO\_BON_{i,t}$ is cash-bonus payment to CEO of firm i period t, scaled by total cash compensation to CEO period t; $CFO\_BON_{i,t}$ is cash-bonus payment to CFO of firm i period t, scaled by total cash compensation to CFO period t; $COB\_COSTOCK_{i,t}$ is number of conditional stocks held by COB of firm i time t, scaled by number of common stocks held by COB at time t; $CEO\_COSTOCK_{i,t}$ is number of conditional stocks held by CEO of firm i time t, scaled by number of common stocks held by CEO at time t; $CFO\_COSTOCK_{i,t}$ is number of conditional stocks held by CFO of firm i time t, scaled by number of common stocks held by CFO at time t; $COB\_OPT_{i,t}$ is number of executive stock options held by COB of firm i time t, scaled by number of common stocks held by COB at time t; $CEO\_OPT_{i,t}$ is number of executive stock options held by CEO of firm i time t, scaled by number of common stocks held by CEO at time t; $CFO\_OPT_{i,t}$ is number of executive stock options held by CFO of firm i time t, scaled by number of common stocks held by CFO at time t; $BATH_{i,t}$ is changes in pre-impairment earnings of firm i from period t-1 to t, scaled by total assets at time t-1, when below the median of nonzero negative values of this variable; otherwise 0; $SMOOTH_{i,t}$ is changes in pre-impairment earnings of firm i from period t-1 to t, scaled by total assets at time t-1, when above the median of nonzero positive values of this variable; otherwise 0; $\Delta COB_{i,t}$ equals 1 if firm i changes COB in period t; otherwise 0; $\Delta CEO_{i,t}$ equals 1 if firm i changes CEO in period t; otherwise 0; $\Delta CFO_{i,t}$ equals 1 if firm i changes CFO in period t; otherwise 0; $DEBT_{i,t}$ is pre-impairment debt-to-equity ratio of firm i, period t; $lnSIZE\_MV_{i,t}$ is natural logarithm of equity-market value of firm i time t. t-statistics are given in parentheses. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). To investigate the effect of outliers, all the continuous variables are winsorised at 5th and 95th percentile.

Table 7.18 reports associations between goodwill-impairment losses, variables for economic impairment and variables for earnings-management incentives. Both logit and tobit regressions are run. Tobit-regression coefficients can be interpreted in much the same way as ordinary-least-square regression coefficients (Gujarati 2003:618). Logit-regression coefficients, however, cannot. In such cases marginal effects should be calculated. The marginal effect of one explanatory variable on the dependent binary variable is calculated by holding the other explanatory variables constant at relevant values. For the purpose of this investigation, however, sign and significance of the associations are of interest, not the absolute and relative strength of the associations. There is, therefore, no need for calculating and interpreting marginal effects.

The above regressions are supposed to test four sets of hypotheses: Two sets of hypotheses for associations between impairment decisions, size of impairment losses and variables expected to reflect economic impairment, and two sets of hypotheses for associations between impairment decisions, size of impairment losses and variables expected to reflect earnings-management incentives. Economic variables are included at three aggregation levels: macro-economic level, industry-sector level and firm level. There is only one variable included at the macro-economic level: percentage changes in unemployment rates *(ΔUNEMPLOY%)*. The association between this variable and impairment decisions *(IMP_DECISION)* is significantly positive (t-value: 1.94) when regression is run on non-winsorised variables (See table 7.18). This suggests that impairment losses are more likely reported in fiscal years with increased unemployment. The result is to some extent affected by extreme observations. Winsorising turns the association barely insignificant (t-value: 1.56). Stronger results are found for the associations between percentage changes in unemployment rates *(ΔUNEMPLOY%)* and size of impairment losses *(IMP_AMOUNT)*. Coefficients are significantly positive when the regression is run on winsorised and non-winsorised variables. This suggests that large increases in unemployment are associated with large impairment losses in goodwill, which is as predicted. The results are also robust to the exclusion of financial-recession observations (See table B1), but not robust to the exclusion of observations with large goodwill-impairment losses (See table B2). The results are also unaffected by alternative specifications of some of the variables for earnings-management incentives (See table B3). When changes rather than levels of cash-bonus payments are included as bonus-incentive variables, the coefficients on percentage changes in unemployment rates *(ΔUNEMPLOY%)* remain significantly positive. Taken together, these results support hypotheses 3c and 3d that percentage changes in unemployment rates *(ΔUNEMPLOY%)* are positively associated with impairment decisions *(IMP_DECISION)* and size of impairment losses *(IMP_AMOUNT)*.

Like at the macro-economic level, one economic variable is included at the industry-sector level: changes in industry-sector return-on-assets *(ΔINDROA)*. A significantly negative association is found between this variable and impairment decisions *(IMP_DECISION)* (See table 7.18). The association is insignificant when variables are winsorised and when financial-recession observations are excluded (See table B1). The association, however, turns significantly negative again for non-winsorised variables when the firm-year observations exclude observations with large impairment losses (See table B2). Similar results to those reported in table 7.18 and table B2 are also found when alternative specifications are employed for bonus-incentive variables (See table B3). Taken together, these results provide some support for hypothesis 3e. No significant association, however, is found between changes in industry-sector return-on-assets *(ΔINDROA)* and size of impairment losses *(IMP_AMOUNT)* (See table 7.18). The only exception is when variables are non-winsorised and the regression is run on a sample that excludes large impairment losses (See table B2). This last result is too weak to support a negative association between changes in industry-sector return-on-assets *(ΔINDROA)* and size of impairment losses *(IMP_AMOUNT)*. Hypothesis 3f is, therefore, rejected.

Several of the firm-level economic variables are found to be associated with impairment decisions *(IMP_DECISION)* and size of impairment losses *(IMP_AMOUNT)* (See table 7.18). Impairment losses are more likely and generally larger in firms with impaired stock returns *(RET)*. The associations are significantly negative in all regressions, which means that they are unaffected by winsorising. These results are also robust to the exclusion of financial-recession observations (See table B1), robust to alternative specifications of bonus-incentive variables (See table B3) and rather robust to the exclusion of observations with large impairment losses (See table B2). Hypotheses 3i and 3j are, therefore, supported. A significantly negative association is also found between percentage changes in total sales *(ΔSALES%)* and size of impairment losses (*IMP_AMOUNT)* (See table 7.18). This indicates that impairment losses are larger in firms where total sales have fallen relative to the previous year. The association between percentage changes in total sales *(ΔSALES%)* and impairment decisions *(IMP_DECISION)*, however, is insignificant. These results are more supportive to the hypotheses when regressions are run on observations excluding financial-recession observations. Percentage changes in total sales *(ΔSALES%)* are found to be significantly negatively associated with impairment decisions *(IMP_DECISION)* and size of impairment losses (*IMP_AMOUNT)* when these observations are excluded (See table B1). Similar results are found when changes rather than levels of cash-bonus payments are used as explanatory variables (See table B3). Taken together, these results provide some support for hypothesis 3l, suggesting a negative association between percentage changes in total sales *(ΔSALES%)* and size of impairment losses (*IMP_AMOUNT)*. Hypothesis 3k, however, should be rejected. No significantly negative association is found between percentage changes in total sales *(ΔSALES%)* and impairment decisions *(IMP_DECISION)*.

Changes in pre-impairment return-on-assets *(ΔROA)* are not found to have any significant association with either impairment decisions *(IMP_DECISION)* or size of impairment losses *(IMP_AMOUNT)*. All the coefficients are insignificant in table 7.18. These results are also robust to the exclusion of observations for the financial-recession year (See table B1) and observations with large impairment losses (See table B2). Insignificant coefficients are also found when changes rather than levels of bonus-incentive variables are employed (See table B3). These results reject hypotheses 3m and 3n that changes in pre-impairment return-on-assets are negatively associated with impairment decisions *(IMP_DECISION)* and size of impairment losses (*IMP_AMOUNT)*. More supportive results are found for percentage changes in operating cash flows *(ΔOCF%)*. A significantly negative association is found between this variable and impairment decisions *(IMP_DECISION)* and size of impairment losses *(IMP_AMOUNT)* (See table 7.18). Excluding the financial-recession observations, turns the association between percentage changes in operating cash flows *(ΔOCF%)* and impairment decisions *(IMP_DECISION)* insignificant in most of the regressions (See table B1). The association between this variable and size of impairment losses *(IMP_AMOUNT)* is significant, however, for winsorised variables (See table B1). For observations excluding large impairment losses, all associations are significantly negative (See table B2). Supportive results are also found when alternative specifications bonus-incentive variables are employed (See table B3). Taken together, these results provide support for hypotheses 3o and 3p, suggesting that changes in operating cash flows are negatively associated with *(IMP_DECISION)* and size of impairment losses *(IMP_AMOUNT)*. Significantly positive associations are found between pre-impairment book-to-market ratios *(BM)*, impairment decisions *(IMP_DECISION)* and size of impairment losses *(IMP_AMOUNT)* (See table 7.18). This suggests that firms with higher pre-impairment book-to-market ratios generally report more and larger impairment losses. These results are rather robust to the exclusion of financial-recession observations (See table B1), the exclusion of large impairment losses (See table B2) and alternative specifications of bonus-incentive variables (See table B3). Hypotheses 3q and 3r are, therefore, supported, suggesting positive associations between pre-impairment book-to-market ratios *(BM)*, impairment decisions *(IMP_DECISION)* and size of impairment losses *(IMP_AMOUNT)*.

Strong evidence is found for a positive association between previous year's impairment losses *(HIST)* and current year's impairment losses *(IMP_DECISION)*. If the firm reports impairment losses in goodwill one year, it is likely that this firm will report impairment losses the next year. A positive association is also found between previous year's impairment losses *(HIST)* and size of current year's impairment losses *(IMP_AMOUNT)*. This suggests that not only the likelihood of reporting an impairment loss increases when impairment losses are reported the previous year, but also the likelihood of reporting relatively larger impairment losses. Moreover, these results are unaffected by the exclusion of financial-recession observations (See table B1), the exclusion of observations with large impairment losses in goodwill (See table B2) and alternative specifications of bonus-incentive variables (See table B3). Hypotheses 3s and 3t are, therefore, supported. All in all, the results in table 7.18 along with additional results in appendix B (table B1 to table B3) support the notion that goodwill-impairment losses reported under current IFRS reflect economic impairment in goodwill. Strong support are found for predicted associations between variables for economic impairment (measured at three different aggregation levels), the decision to report impairment losses and size of reported impairment losses.

The associations between variables for earnings-management incentives and impairment losses are generally insignificant (See table 7.18). Given that these variables reflect incentives to misrepresent impairment losses in goodwill, the insignificant associations provide further support for the notion that goodwill-impairment losses reflect economic impairment in goodwill rather than earnings-management incentives. The included incentive variables can be categorised as remuneration variables (cash-bonus payments, conditional stocks and stock options), reporting-strategy variables (big-bath accounting and income smoothing), management-change variables and variables reflecting debt-covenant incentives and political-cost incentives[34]. Table 7.18 demonstrates some predicted and some unpredicted associations between remuneration variables and impairment losses. Cash bonus payments to COB, CEO and CFO *(BON_COB, BON_CEO, BON_CFO)* are supposed to be negatively associated with impairment decisions *(IMP_DECISION)* and size of impairment losses *(IMP_AMOUNT)*. Consistent with these predictions, CFO cash-bonus payments *(CFO_BON)* are negatively associated with impairment decisions *(IMP_DECISION)* and negatively associated with size of impairment losses *(IMP_AMOUNT)* (See table 7.18). A negative association is also revealed between these cash-bonus payments and impairment decisions *(IMP_DECISION)* and size of impairment losses *(IMP_AMOUNT)* when financial-recession observations are excluded (See table B1). Similar results are found when large impairment losses are excluded (See table B2) and when conditional stocks and stock options are scaled by number of outstanding stocks rather than the stocks held by the managers (See table B3).

[34] The extent to which firm size *(lnSIZE_MV)* truly reflect political-cost incentives is, however, debatable and will be discussed later in this section.

Changes rather than levels of cash-bonus payments are employed as alternative specifications for the cash-bonus variables. Changes in cash-bonus payments are supposed to reflect the extent to which the bonus target is reached the current fiscal year relative to the previous fiscal year. An increase in cash-bonus payments the current year suggests that net earnings[35] are higher relative to the threshold of bonus payment this year than the previous year. A decrease in cash-bonus payments the current year suggests the opposite that net earnings are lower relative to the threshold for cash-bonus payments this year than the previous year. Changes in CFO cash-bonus payments *(ΔCFO_BON)* are negatively associated with impairment decisions *(IMP_DECISION)* and size of impairment losses *(IMP_AMOUNT)* (See table B3). This suggests that increases in CFO cash-bonus payments are less likely associated with impairment losses and if impairment losses are reported, relatively smaller impairment losses, which is consistent with expectations. Taken together, the above results provide some support to hypotheses 3u and 3v concerning CFO cash-bonus payments.

The results for COB cash-bonus payments *(COB_BON)*, however, are surprising. These cash-bonus payments are positively associated with impairment decisions *(IMP_DECISION)* and size of impairment losses *(IMP_AMOUNT)* (See table 7.18). The higher the COB cash-bonus payment, the more likely is the incidence of goodwill-impairment losses and relatively larger goodwill-impairment losses. These results are sensitive to winsorising and the exclusion of financial-recession observations. When variables are winsorised at 5% level, the associations turn insignificant (See table 7.18). The same is the case when financial-recession observations are excluded (See table B1). Firm-year observations with large impairment losses, however, do not seem to have any substantial effect on the

[35] This is based on the premise that net earnings represent the target variable for bonus payments.

results in table 7.18. The associations are still positive when these observations are excluded (See table B2). The coefficients on changes in COB cash-bonus payment, however, are insignificant (See table B3).

The unpredicted results need further investigation. COB cash-bonus payments are rather rare. These payments are only found in 105 out of 1109 firm-years (9.47%) with available cash-bonus information. The reason is that COBs generally receive board fees and expense benefits rather than bonus payments. This makes it interesting to investigate whether there is something peculiar about COBs receiving cash-bonus payments. A regression is run with COB cash-bonus payments *(COB_BON)* as dependent variable on two explanatory variables reflecting COB characteristics. As the dependent variable, COB cash-bonus payments *(COB_BON)*, is continuous and censored at zero, a tobit regression is run. COB characteristics are measured by an indicator variable for COB-CEO duality and a variable for COB tenure, which equals the natural logarithm of the number of years the COB has held his current position. Both COB-CEO duality (t-value: 2.31) and COB tenure (t-value: 2.61) are positively associated with COB cash-bonus payments (Results are not tabulated). Cash-bonus payments are generally given to COBs that simultaneously function as CEOs and to COBs that have held their position for a longer period of time than the average COB.

Cash-bonus payments are expected to be positively associated with conventional performance measures. Stock returns and earnings-per-share are included as additional variables in the above tobit regression to investigate whether COB cash-bonus payments are explained by these performance measures. The inclusion of these variables have no effect on the positive association between COB cash-bonus payments *(COB_BON)*, COB-CEO duality (t-value: 2.22) and COB tenure (t-value: 2.58) (Results are not tabulated). Even more striking, these performance measures have no significantly positive association with COB cash-bonus payments. The coefficients on stock returns (t-value: 1.57) and earnings-per-share (t-value: 1.16) are insignificantly positive (Results are not tabulated). Moreover, the above results are robust to alternative specifications of these performance measures. To remove any effect of goodwill-impairment losses, a pre-impairment earnings measure is employed rather than a post-impairment measure. COB cash-bonus payments are, still, positively associated with COB-CEO duality (t-value: 2.23) and COB tenure (t-value: 2.58) (Results are not tabulated). The coefficient on pre-impairment earnings, however, is insignificant (t-value: 1.10). Similar results are revealed when these cash-bonus payments are regressed on annual changes in the performance measures (Results are not tabulated). Thus, these cash-bonus payments cannot be explained by conventional performance measures. Rather, the above results suggest that these bonus payments are explained by the significant concentration of power on the hands of some COBs.

Positive associations are also found between CEO cash-bonus payments *(CEO_BON)*, impairment decisions *(IMP_DECISION)* and size of impairment losses *(IMP_AMOUNT)* (See table 7.18). These associations are only significantly positive when variables are winsorised. A positive association is also found between these payments and size of impairment losses when winsorised variables are run on observations excluding the financial-recession year (See table B1). A significantly positive association is also found between changes in CEO cash-bonus payments *(ΔCEO_BON)* and size of impairment losses *(IMP_AMOUNT)* (See table B3). The associations, however, are insignificant when observations with large impairment losses are excluded (See table B2). In contrast to COB cash-bonus payments, CEO cash-bonus payments *(CEO_BON)* are not associated with COB-CEO duality (t-value: -1.47) and CEO tenure (t-value: 0.83). Besides, there are significantly positive associations between these CEO cash-bonus payments *(CEO_BON)*, stock returns (t-value: 2.79) and earnings-per-share (t-value: 3.21) (Results are not tabulated). These results are also robust to alternative specifications of net earnings such as changes rather than levels of net earnings per share or the use of pre-impairment earnings per share rather than post-impairment earnings per share. The results are unchanged. The positive association between CEO cash-bonus payments and impairment losses remains, therefore, a puzzle.

The other elements of the remuneration package are generally insignificantly associated with impairment losses (See table 7.18). There are some exceptions. CFO conditional stocks *(CFO_COSTOCK)* are found to be negatively associated with size of impairment losses *(IMP_AMOUNT)* for non-winsorised variables (See table 7.18). This is also the case if changes rather than levels of cash-bonus payments are included as explanatory variables (See table B3). A significantly negative association, however, is not found if variables are run on observations excluding financial-recession observations (See table B1) or when observations with large goodwill-impairment losses are excluded (See table B2). This provides some weak support for hypothesis 3w and 3x, suggesting a negative association between CFO conditional stocks *(CFO_COSTOCK)*, impairment decisions *(IMP_DECISION)* and size of impairment losses *(IMP_AMOUNT)*. Some unpredicted positive associations are found between CEO conditional stocks *(CEO_COSTOCK)*, impairment decisions *(IMP_DECISION)* and size of impairment losses *(IMP_AMOUNT)*. These results are limited to some of the regressions run on observations excluding financial-recession observations or observations excluding large impairment losses (See table B1 and table B2). This suggests that hypothesis 3w and 3x should be rejected for COB conditional stocks and CEO conditional stocks. Some weak support, however, is found for a negative association between CFO conditional stocks and impairment losses in goodwill.

Some associations between stock options and impairment losses are unpredicted, others are consistent with predictions. Some weak evidence is found for negative associations between COB stock options *(COB_OPTION)* and size of impairment losses *(IMP_AMOUNT)*. These significantly negative associations, however, are limited to regressions excluding firm-year observations with large goodwill-impairment losses (See table B2). There is also found some weak evidence of a negative association between these stock options and impairment decisions *(IMP_DECISION)* when financial-recession observations are excluded. Some unpredicted positive associations are found when changes rather than levels of cash-bonus payments are included as explanatory variables (See table B3). These results are to some extent sensitive, however, to the exclusion of financial-recession observations (See table B1) and the exclusion of firm-year observations with large impairment losses (See table B2). Taken together, the above results suggest that hypotheses 3y and 3z should be rejected.

The reporting-strategy variables *(BATH, SMOOTH)* are generally insignificantly associated with impairment decisions *(IMP_DECISION)* and size of impairment losses *(IMP_AMOUNT)*. The only exception is the positive association between smoothing proxy *(SMOOTH)* and size of impairment losses *(IMP_AMOUNT)* (See table 7.18), which is consistent with predictions. High positive fluctuations in pre-impairment net earnings are expected to be associated with larger impairment losses. The association, however, is only significant for non-winsorised variables. Similar results are found when financial-recession observations are excluded (See table B1) and when changes rather than levels of cash-bonus payments are employed (See table B3). However, the coefficient on the smoothing proxy *(SMOOTH)* turns insignificant if observations with large impairment losses are excluded (See table B2). This suggests that the associations between the smoothing proxy *(SMOOTH)* and impairment losses are not very robust. The associations between the big-bath proxy and impairment losses are all insignificant (See table 7.18 and table B1 to table B3). Taken together, the above results provide some weak support for hypothesis 3af, suggesting a positive association between smoothing incentives and size of impairment losses. Hypothesis 3ae, suggesting a positive association between smoothing incentives *(SMOOTH)* and impairment decisions *(IMP_DECISION)*, however, is rejected. Hypotheses 3ac and 3ad, suggesting a negative association between big-bath incentives *(BATH)* and impairment losses *(IMP_DECISION, IMP_AMOUNT)*, should also be rejected.

COB changes *(ΔCOB)* are found to be negatively associated with impairment decisions *(IMP_DECISION)* and size of impairment losses *(IMP_AMOUNT)* for non-winsorised variables (See table 7.18). These results, however, are sensitive to the exclusion of financial-recession observations and observations with large impairment losses (See table B1 and table B2). The coefficient on COB changes *(ΔCOB)* is insignificant or barely insignificant in these regressions. Some of these results are inconsistent with predictions in hypotheses 3ag and 3ah. Top management changes are expected to be associated with more and larger impairment losses. Some weak evidence consistent with these predictions, however, is reported for CEO changes *(ΔCEO)*. The association between these changes and size of impairment losses *(IMP_AMOUNT)* is barely insignificant (t-value: 1.61) when the regression is run for winsorised variables (See table 7.18). When changes rather than levels of cash-bonus payments are used as explanatory variables, the association becomes significantly positive (See table B3). The association is insignificant, however, when financial-recession observations and observations with large impairment losses are excluded (See table B1 and table B2). Taken together, this provides some support for hypothesis 3ah that CEO changes *(ΔCEO)* are positively associated with size of impairment losses *(IMP_AMOUNT)*.

Debt-covenant incentives measured by pre-impairment debt-to-equity ratios *(DEBT)* are found to be positively associated with impairment decisions *(IMP_DECISION)* and size of impairment losses *(IMP_AMOUNT)* when regressions are run on winsorised variables (See table 7.18). This unpredicted positive association is robust to the exclusion of financial-recession observations (See table B1), the exclusion of observations with large impairment losses (See table B2) and when changes rather than levels of cash-bonus payments are included in the regressions (See table B3). The positive association between debt-to-equity and impairment losses may indicate financial distress. Firms exposed to financial distress may have high leverage and report more and larger impairment losses. Little support, however, is found for this claim. When debt-to-equity *(DEBT)* is regressed on firm-level performance variables, such as stock returns *(RET)*, percentage changes in total sales *(ΔSALES%)*, changes in pre-impairment return-on-assets *(ΔROA)* and percentage changes in operating cash flows *(ΔOCF%)*, all associations are insignificant (Results are not tabulated). This is somewhat different for firms having high debt-to-equity ratios. An indicator variable is generated which equals 1 when debt-to-equity ratios are above the 75^{th} percentile of the debt-to-equity ratios and otherwise 0. This indicator variable is logit regressed on the above performance variables. A significantly negative association is found between the debt-indicator variable and stock returns *(RET)* (t-value: -2.58), suggesting that firms with high leverage generally have lower stock returns. The other associations are insignificant (Results are not tabulated).

The results in table 7.18 are unchanged if the above indicator variable is employed as explanatory variable of impairment losses rather than debt-to-equity ratios *(DEBT)*. The association between this indicator variable and impairment decisions *(IMP_DECISION)* is significantly positive (t-value: 2.95) (non-winsorised variables). Similar results are found when the tobit regression in table 7.18 is rerun with this indicator variable. The association between this indicator variable and size of impairment losses is also significantly positive *(IMP_AMOUNT)* (t-value: 2.83) (Results are not tabulated). Rather, if the regressions in table 7.18 are rerun on firm-year observations with debt-to-equity ratios below the 75th percentile, the associations between the pre-impairment debt-to-equity ratios *(DEBT)*, impairment decisions *(IMP_DECISION)* and size of impairment losses *(IMP_AMOUNT)* become highly insignificant (t-values: -0.78 and -0.13, respectively). These results suggest that the positive associations between debt-to-equity ratios and impairment losses are driven by firms with very high debt-to-equity ratios. These firms seem to suffer from lower market performance than the average firm which may indicate financial distress. Taking these results together, hypotheses 3ai and 3aj should be rejected. Debt-covenant incentives indicated by debt-to-equity ratios *(DEBT)* are not negatively associated with impairment losses *(IMP_DECISION, IMP_AMOUNT)*.

The final results concern associations between firm size *(lnSIZE_MV)* and impairment losses. Larger firms tend to report more and larger impairment losses. These results are to some extent robust to the exclusion of financial-recession observations (See table B1), the exclusion of observations with large impairment losses (See table B2) and when changes rather than levels in cash-bonus payments are employed (See table B3). These results support hypotheses 3ak and 3al, suggesting a positive association between firm size *(lnSIZE_MV)* and impairment losses *(IMP_DECISION, IMP_AMOUNT)*. There might be several explanations of these results where political-cost considerations are one. An alternative explanation is that larger firms hold more financial-accounting expertise, which results in the recognition of more impairment losses. A related explanation is that larger firms are followed by more market participants, which leads to higher accounting quality and the recognition of more impairment losses. These two arguments are based on the assumption that firms generally understate rather than overstate impairment losses (e.g. Ramanna 2008, Ramanna and Watts 2009). A final explanation is that larger firms tend to be diversified over multiple segments, which increases the likelihood of impairment losses. To make an attempt to disentangle between these possible explanations, a regression with firm size *(lnSIZE_MV)* as dependent variable is run on three explanatory variables: natural logarithm of audit-committee members *(lnAUDIT_SIZE)*, an indicator variable which equals 1 if the firm has a financial-accounting expert on the board *(ACCEXP)*, and the natural logarithm of the number of business segments. The audit-committee members (t-value: 7.19) and the number of business segments (t-value: 1.82) are significantly positively associated with firm size. The coefficient on the indicator variable, financial-accounting expertise, is negative (t-value: -2.03), however, suggesting that larger firms tend to lack financial-accounting experts on the board. This last result is not sufficient to conclude that larger firms lack financial-accounting expertise in general. Without additional data, it is difficult to disentangle one reason from the other. Nevertheless, hypotheses 3ak and 3al are supported.

All in all, the results in table 7.18, along with additional results in table B1 to table B3, suggest that goodwill-impairment losses reported under current IFRS are associated with variables for economic impairment. This is demonstrated by significant associations between these impairment losses and variables supposed to reflect economic impairment. Some rather weak results, however, indicate that these losses might be associated with CFO cash-bonus payments, CFO conditional stocks, smoothing incentives and CEO changes. The other incentive variables have insignificant associations or unpredicted significant associations with impairment losses. Caution, however, should be exercised when interpreting the insignificant associations. There might be at least two explanations for insignificant associations between variables for earnings-management incentives and impairment losses: Reported impairment losses have no significant association with the true, but unobservable, earnings-management incentives, which suggests that these impairment losses are not influenced by earnings management. Or these insignificant associations might be the result of econometrical problems, potentially caused by measurement errors in the earnings-management incentive variables.

7.3.3. Abnormal-impairment losses, earnings-management incentives and corporate-governance mechanisms

This section investigates associations between goodwill-impairment losses, variables for earnings-management incentives and corporate-governance mechanisms. Abnormal-impairment losses are estimated as the difference between reported impairment losses and estimates of normal-impairment losses. These normal-impairment losses are fitted values from a regression of reported impairment losses on variables for economic impairment. An ordninary-least-square regression is employed rather than a tobit regression since the former regression model has better specified residuals than the latter regression model (Lapointe-Antunes et al. 2008). Given that these normal-impairment losses reflect economic impairment, any positive or negative deviation from these estimated normal-impairment losses should be interpreted as misrepresentation of the the underlying economic impairment. Misrepresentation might reflect unintended and intended measurement errors. Intended measurement errors will probably reflect earnings management.

Estimates of abnormal-impairment losses are determined by the set of economic variables employed to estimate normal-impairment losses. To investigate the robustness of this estimation, three alternative sets of economic variables are employed. In contrast to previous analysis, multicollinearity is not a concern here. Muliticollinearity is only a concern when estimating and interpreting the strength and the significance of associations between a dependent variable and explanatory variables, not when estimating fitted values on estimated regression parameters. No economic variables should, therefore, be excluded from the estimation of normal-impairment losses based on arguments of multicollinearity.

The first of these three sets of variables comprises all, but one, of the economic variables specified in subchapter 6.3 above. The variable excluded is the indicator variable for previous year's impairment losses *(HIST)*. As argued above, this variable might reflect economic impairment (successive economic impairment) as well as incentives to avoid and/or delay impairment recognition. The second set of variables comprises only market-based variables of firm-performance: stock returns *(RET)* and pre-impairment book-to-market ratios *(BM)*. These variables are sometimes perceived as the sole indicators of impairment. Deteriorated stock returns signify lower firm performance, and thereby, lower future earnings capacity. Pre-impairment book-to-market ratios indicate whether firms are in an impairment position or not. Fitted values from a regression of impairment losses on these two market-based variables will provide market-based estimates of normal, and thereby, abnormal-impairment losses in goodwill. The results for the regressions employing these abnormal-impairment losses as dependent variable are reported in table B5 in appendix B. The third set of economic variables comprises firm-level economic variables *(RET, ΔSALES%, ΔROA*, *ΔOCF%, BM)*. Normal and abnormal-impairment losses are estimated on market-based, accounting-based and cash-based economic variables. The results from regressions employing these abnormal-impairment losses as dependent variable are reported in table B6 in appendix B.

Abnormal-impairment losses take negative and positive values. Negative abnormal-impairment losses imply that reported impairment losses are lower than expected impairment losses. This indicates understated losses. In contrast, positive abnormal-impairment losses imply that reported impairment losses are larger than expected impairment losses, which indicates overstated losses. Expected impairment losses are censored at zero if predicted values of impairment losses are negative. Negative values on estimated impairment losses are consistent with positive revaluations of goodwill, which are prohibited under current IFRS. To be consistent with GAAP, these values are set equal to zero. Estimation of abnormal-impairment losses (based on the full set of economic variables) reveals that understated impairment losses are more frequent among the sample firms than overstated impairment losses. Impairment losses are found to be understated in 886 out of 1086 firm-year observations. The picture is somewhat different, however, for overstated impairment losses. Indications of overstated losses are only found in 125 firm years. If normal-impairment losses are estimated on the second set of market-based impairment variables (numbers for the third set are given in parentheses), the ratio of understated and overstated impairment losses is rather unchanged. There are indications that 896 (902) out of 1093 (1068) reported impairment losses are understated, whereas 132 (124) are overstated.

The high frequency of understated impairment losses relative to overstated impairment losses might have several reasons. One reason is that managers exploit the discretionary freedom in reporting impairment losses to avoid and/or delay recognition of impairment losses. Some evidence in the previous section indicates that impairment losses might be understated (See table 7.18, results for variable *HIST*). An alternative reason is that impairment losses are systematically understated relative to impairment losses in total goodwill as a result of the impairment-testing procedure. Several factors may shield an impairment loss from being recognised in goodwill. First, positive differences between book values and recoverable amounts of assets constitute impairment losses. Goodwill is tested in an indirect way where recoverable amounts of cash-generating units to which goodwill is allocated are compared to book values of the assets (inclusive book value of goodwill) of the cash-generating units. If recoverable amounts of these assets (exclusive goodwill) are higher than their book values, the extra benefits associated with these assets increase the recoverable amounts of the cash-generating units where goodwill is tested and may shield impairment losses in goodwill. Second, a related issue is that internally-generated goodwill may replace impaired purchased goodwill. The impairment test requires no distinction to be made between internally-generated goodwill and purchased goodwill when estimating recoverable amounts.

Third, estimates of normal-impairment losses will likely reflect impairment losses in total goodwill, that is, the sum of impairment losses in internally-generated goodwill and book goodwill. The estimated impairment losses might be too large on average to reflect economic impairment in book goodwill, which apparently leads to the estimation of more understated than overstated impairment losses. This represents a potential source of measurement errors in normal and abnormal-impairment losses. As stated above, alternative sets of economic variables are employed to estimate abnormal-impairment losses in order to investigate the robustness of the results. However, these robustness tests do not seem to face the core of the problem, that is, to estimate the portion of total economic impairment losses to be deducted from book goodwill. Such estimates are hard to obtain. The problem of their estimation is related to the fundamental challenge of distinguishing internally-generated goodwill from remaining purchased goodwill.

The regressions are run for two sets of explanatory variables: variables for earnings-management incentives only, and variables for earnings-management incentives along with corporate-governance mechanisms. The results from regressions with variables for earnings-management incentives and corporate-governance mechanisms will be emphasised in the discussion below. Regressions are run separately for negative and positive abnormal-impairment losses. When negative abnormal-impairment losses are used as dependent variable, they are right censored at zero. Similarly, when positive abnormal-impairment losses are used as dependent variable, they are left censored at zero. Since the dependent variables are either right or left censored, a tobit regression is employed. In order to investigate the influence of outliers, the regressions are rerun with continuous variables censored at 5^{th} and 95^{th} percentile. Firm-year observations over the period 2005-2009 are employed, and all t-statistics from the regressions are White-adjusted and clusted at firm level.

Table 7.19 Abnormal-impairment losses, earnings-management incentives and corporate-governance mechanisms – hypotheses 4a to 4al[36]

	Understated impairment losses					Overstated impairment losses				
		Earnings management		*Earnings management and corporate governance*			*Earnings management*		*Earnings management and corporate governance*	
Test variables	*Pred*	*Non-winsorised*	*Winsorised*	*Non-winsorised*	*Winsorised*	*Pred*	*Non-winsorised*	*Winsorised*	*Non-winsorised*	*Winsorised*
Intercept		0.006*	0.003**	0.010**	0.004**		-0.022*	-0.009**	0.007	0.002
		(1.96)	(2.23)	(2.41)	(2.54)		(-1.85)	(-2.21)	(0.38)	(0.41)
$COB\_BON_{i,t}$	-	$8.16*10^{-4}$	$1.09*10^{-4}$	$1.57*10^{-4}$	$4.39*10^{-4}$	-	0.008*	0.003	0.009*	0.003
		(0.62)	(0.12)	(0.09)	(0.44)		(1.78)	(1.17)	(1.64)	(1.18)
$CEO\_BON_{i,t}$	-	$-6.37*10^{-5}$	$2.68*10^{-4}$	$-8.71*10^{-5}$	$-1.98*10^{-4}$	-	0.002*	0.006***	$8.22*10^{-4}$	0.005**
		(-0.19)	(0.31)	(-0.25)	(-0.23)		(1.96)	(2.89)	(1.48)	(2.36)
$CFO\_BON_{i,t}$	-	-0.001	-0.001	-0.001	$-6.84*10^{-4}$	-	-0.019***	-0.010***	-0.019***	-0.010***
		(-1.56)	(-1.19)	(-1.58)	(-0.82)		(-3.29)	(-4.61)	(-3.53)	(-4.19)
$COB\_COSTOCK_{i,t}$	-	$1.73*10^{-4}$	$8.94*10^{-4}$	$2.23*10^{-4}$	$3.69*10^{-4}$	-	-0.0032	-0.002	-0.002	$1.98*10^{-4}$
		(0.73)	(0.66)	(0.90)	(0.25)		(-1.41)	(-0.38)	(-0.86)	(0.04)
$CEO\_COSTOCK_{i,t}$	-	$7.78*10^{-5}$**	$3.78*10^{-5}$*	$5.55*10^{-5}$	$1.38*10^{-5}$	-	$-5.94*10^{-7}$	$3.61*10^{-5}$	$5.38*10^{-6}$	$1.34*10^{-7}$
		(2.00)	(1.73)	(1.50)	(0.66)		(-1.53)	(0.76)	(0.09)	(0.00)
$CFO\_COSTOCK_{i,t}$	-	$5.04*10^{-7}$	$-3.91*10^{-6}$	$8.06*10^{-7}$	$5.76*10^{-6}$	-	$-3.11*10^{-5}$	$-3.60*10^{-5}$	$-4.38*10^{-5}$	$-2.97*10^{-5}$
		(1.31)	(-0.48)	(1.01)	(0.65)		(-0.83)	(-1.66)	(-1.16)	(-1.26)
$COB\_OPTION_{i,t}$	-	$-1.11*10^{-4}$	$6.94*10^{-5}$	$-1.29*10^{-4}$	$-7.10*10^{-7}$	-	$-9.58*10^{-4}$	$-2.05*10^{-4}$	-0.002	-0.002
		(-1.39)	(0.14)	(-1.54)	(-0.00)		(-1.00)	(-0.12)	(-1.12)	(-0.91)
$CEO\_OPTION_{i,t}$	-	$-2.55*10^{-5}$***	$-1.82*10^{-5}$	$-2.75*10^{-5}$***	$-1.21*10^{-6}$	-	$4.54*10^{-6}$	$-3.49*10^{-5}$	$-3.20*10^{-5}$	$-8.93*10^{-5}$*
		(-2.90)	(-1.26)	(-2.81)	(-0.08)		(0.61)	(-0.85)	(-1.44)	(-1.95)
$CFO\_OPTION_{i,t}$	-	$6.01*10^{-7}$	$-8.22*10^{-7}$	$-3.30*10^{-7}$	$-1.09*10^{-5}$*	-	$1.12*10^{-5}$**	$2.49*10^{-5}$	$1.37*10^{-5}$**	$3.59*10^{-5}$**
		(0.59)	(-0.15)	(-0.31)	(-1.84)		(2.44)	(1.40)	(2.36)	(2.01)

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[36] No test results are provided for hypotheses 4g and 4h.

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		Understated impairment losses					**Overstated impairment losses**			
		Earnings management		*Earnings management and corporate governance*			*Earnings management*		*Earnings management and corporate governance*	
Test variables	*Pred*	*Non-winsorised*	*Winsorised*	*Non-winsorised*	*Winsorised*	*Pred*	*Non-winsorised*	*Winsorised*	*Non-winsorised*	*Winsorised*
$BATH_{i,t}$	-	0.004	$4.81*10^{-4}$	0.003	$-1.03*10^{-4}$	-	-0.016	-0.016***	-0.011	-0.011*
		(1.08)	(0.18)	(0.89)	(-0.03)		(-1.38)	(-2.64)	(-1.03)	(-1.74)
$SMOOTH_{i,t}$	+	-0.001**	$-3.60*10^{-4}$**	$-9.40*10^{-4}$*	$-1.90*10^{-4}$	+	-0.001	$-1.55*10^{-4}$	-0.001	$-3.34*10^{-4}$
		(-2.34)	(-2.51)	(-1.93)	(-1.20)		(-0.92)	(-0.40)	(-1.00)	(-0.87)
$\Delta COB_{i,t}$	+	$-7.67*10^{-4}$	$-2.70*10^{-4}$	$-7.70*10^{-4}$	$-2.46*10^{-4}$	+	-0.001	$-1.29*10^{-4}$	-0.003*	$-4.40*10^{-4}$
		(-1.42)	(-1.43)	(-1.34)	(-1.31)		(-0.79)	(-0.25)	(-1.67)	(-0.81)
$\Delta CEO_{i,t}$	+	$3.84*10^{-4}$	$8.52*10^{-5}$	$6.05*10^{-4}$	$3.38*10^{-5}$	+	0.002	$8.64*10^{-4}$*	0.002	$8.59*10^{-4}$*
		(0.71)	(0.45)	(0.92)	(0.16)		(1.36)	(1.81)	(1.26)	(1.78)
$\Delta CFO_{i,t}$	+	$2.79*10^{-5}$	$3.51*10^{-5}$	$-1.77*10^{-4}$	$-4.55*10^{-5}$	+	0.002	$3.09*10^{-5}$	0.002	$3.33*10^{-5}$
		(0.05)	(0.17)	(-0.29)	(-0.21)		(0.93)	(0.07)	(0.98)	(0.07)
$DEBT_{i,t}$	-	$-6.85*10^{-6}$	$1.80*10^{-5}$	$1.44*10^{-6}$	$5.40*10^{-5}$	-	$5.24*10^{-5}$	$1.38*10^{-4}$*	$5.90*10^{-5}$	$1.41*10^{-4}$*
		(-0.78)	(0.52)	(0.22)	(1.54)		(1.62)	(1.85)	(1.35)	(1.90)
$lnSIZE\_MV_{i,t}$	+	$-1.30*10^{-5}$	$-4.42*10^{-5}$	$-2.59*10^{-4}$	$-1.17*10^{-4}$	+	$7.96*10^{-4}$	$3.07*10^{-4}$	-0.002*	$-4.29*10^{-4}$
		(-0.09)	(-0.72)	(-1.16)	(-1.27)		(1.37)	(1.63)	(-1.66)	(-1.57)

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		Understated impairment losses					Overstated impairment losses			
		Earnings management		*Earnings management and corporate governance*			*Earnings management*		*Earnings management and corporate governance*	
Test variables	*Pred*	*Non-winsorised*	*Winsorised*	*Non-winsorised*	*Winsorised*	*Pred*	*Non-winsorised*	*Winsorised*	*Non-winsorised*	*Winsorised*
$lnBOARD\_SIZE_{i,t}$	+			$3.30*10^{-4}$	$1.36*10^{-4}$	-			0.008	0.002*
				(0.30)	(0.31)				(1.53)	(1.93)
$NONEXE_{i,t}$	+			$5.25*10^{-4}$	$1.79*10^{-4}$	-			0.016*	0.002
				(0.25)	(0.23)				(1.79)	(1.13)
$lnBOARD\_MEET_{i,t}$	+			$1.40*10^{-4}$	$2.19*10^{-5}$	-			0.001	-0.002*
				(0.21)	(0.05)				(0.29)	(-1.67)
$COB\_STOCK_{i,t}$	+			-0.003	-0.003	-			0.009	0.003
				(-1.06)	(-0.99)				(0.81)	(0.23)
$CEO\_STOCK_{i,t}$	+			$-1.96*10^{-4}$	-0.003	-			-0.018	-0.012
				(-0.38)	(-1.42)				(-1.23)	(-1.11)
$CFO\_STOCK_{i,t}$	+			-0.013	-0.052	-			-0.240	-0.258
				(-0.51)	(-0.78)				(-1.27)	(-1.01)
$ACCEXP_{i,t}$	+			$4.87*10^{-4}$	$1.07*10^{-4}$	-			0.001	$1.49*10^{-4}$
				(0.94)	(0.58)				(0.83)	(0.29)
$lnAUDIT\_SIZE_{i,t}$	+			$-1.04*10^{-4}$	$-7.79*10^{-5}$	-			-0.003	$-1.83*10^{-5}$
				(-0.10)	(-0.29)				(-0.91)	(-0.02)
$lnAUDIT\_MEET_{i,t}$	+			-0.001	$-4.25*10^{-4}$	-			0.006**	0.002*
				(-1.40)	(-1.53)				(2.08)	(1.65)
$BLOCK\%_{i,t}$	+			$2.42*10^{-5}$	$8.99*10^{-6}$	-			$-1.57*10^{-6}$	$9.98*10^{-6}$
				(1.54)	(1.45)				(-0.03)	(0.60)
$lnBLOCK\_NUM_{i,t}$	+			$-4.15*10^{-4}$	$-7.99*10^{-5}$	-			-0.004**	-0.001**
				(-0.79)	(-0.41)				(-2.21)	(-2.41)
$CROSS_{i,t}$	+			0.0029**	$7.24*10^{-4}$*	-			0.003	0.001
				(2.49)	(1.94)				(1.10)	(1.55)
N		899	899	806	806		869	869	779	779
Log-likelihood		168.314	236.190	147.684	210.105		326.752	529.311	314.119	499.617
Wald Chi2-test		3.20***	1.51*	1.43*	1.51**		1.82**	3.60***	1.35	3.03***
Pseudo R^2		-0.078	-0.043	-0.102	-0.068		-0.094	-0.059	-0.179	-0.102
Max VIF		1.91	4.15	2.65	4.22		1.91	4.15	2.65	4.22
Mean VIF		1.18	1.67	1.49	1.69		1.18	1.67	1.49	1.69

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Understated impairment losses (AB_IMP_NEG) equal negative abnormal impairment losses equals negative differences between reported impairment losses period *t* scaled by total assets at time t-1 and estimated normal (expected) impairment losses of firm i period t. If the estimated normal (expected) impairment losses are negative, they are censored at zero. Overstated impairment losses (AB_IMP_POS) equal positive differences between reported impairment losses period *t* scaled by total assets at time t-1 and estimated normal (expected) impairment losses of firm i period t. If the estimated normal (expected) impairment losses are negative, they are censored at zero. $COB\_BON_{i,t}$ is cash-bonus payment to COB of firm i period t, scaled by total cash compensation to COB period t; $CEO\_BON_{i,t}$ is cash-bonus payment to CEO of firm i period t, scaled by total cash compensation to CEO period t; $CFO\_BON_{i,t}$ is cash-bonus payment to CFO of firm i period t, scaled by total cash compensation to CFO period t; $COB\_COSTOCK_{i,t}$ is number of conditional stocks held by COB of firm i time t, scaled by number of common stocks held by COB at time t; $CEO\_COSTOCK_{i,t}$ is number of conditional stocks held by CEO of firm i time t, scaled by number of common stocks held by CEO at time t; $CFO\_COSTOCK_{i,t}$ is number of conditional stocks held by CFO of firm i time t, scaled by number of common stocks held by CFO at time t; $COB\_OPT_{i,t}$ is number of executive stock options held by COB of firm i time t, scaled by number of common stocks held by COB at time t; $CEO\_OPT_{i,t}$ is number of executive stock options held by CEO of firm i time t, scaled by number of common stocks held by CEO at time t; $CFO\_OPT_{i,t}$ is number of executive stock options held by CFO of firm i time t, scaled by number of common stocks held by CFO at time t; $BATH_{i,t}$ is changes in pre-impairment earnings of firm i from period t-1 to t, scaled by total assets at time t-1, when below the median of nonzero negative values of this variable; otherwise 0; $SMOOTH_{i,t}$ is changes in pre-impairment earnings of firm i from period t-1 to t, scaled by total assets at time t-1, when above the median of nonzero positive values of this variable; otherwise 0; $\Delta COB_{i,t}$ equals 1 if firm i changes COB in period t; otherwise 0; $\Delta CEO_{i,t}$ equals 1 if firm i changes CEO in period t; otherwise 0; $\Delta CFO_{i,t}$ equals 1 if firm i changes CFO in period t; otherwise 0; $DEBT_{i,t}$ is pre-impairment debt-to-equity ratio of firm i, period t; $lnSIZE\_MV_{i,t}$ is natural logarithm of equity-market value of firm i time t; $lnBOARD\_SIZE_{i,t}$ is natural logarithm of number of board members of firm i time t; $NONEXE_{i,t}$ is number of independent non-executive directors in firm i time t, scaled by total number of board members of firm i time t; $lnBOARD\_MEET_{i,t}$ is natural logarithm of number of board meetings of firm i time t; $COB\_STOCK_{i,t}$ is number of common stocks held by COB of firm i time t, scaled by total number of outstanding common stocks of firm i time t; $CEO\_STOCK_{i,t}$ is number of common stocks held by CEO of firm i time t, scaled by total number of outstanding common stocks of firm i time t; $CFO\_STOCK_{i,t}$ is number of common stocks held by CFO of firm i time t, scaled by total number of outstanding common stocks of firm i time t; $ACCEXP_{i,t}$ equals 1 if firm i time t has at least one audit-committee member being financial-accounting expert; otherwise 0; $lnAUDIT\_SIZE_{i,t}$ is natural logarithm of number of audit-committee members of firm i time t; $lnAUDIT\_MEET_{i,t}$ is natural logarithm of number of audit-committee meetings of firm i time t; $BLOCK\%_{i,t}$ is cumulative percentage of outstanding common stocks held by blockholders owning at least 5% of outstanding common stocks of firm i time t; $lnBLOCK\_NUM_{i,t}$ is natural logarithm of number of blockholders owning at least 5% of outstanding stocks of firm i time t; $CROSS_{i,t}$ equals 1 if firm i is cross-listed on the New York Stock Exchange or the NASDAQ Stock Exchange time t; otherwise 0. *indicates significant at 10% level (two-tailed), **indicates significant at 5 % level (two-tailed), *** indicates significant at 1% level (two-tailed). To investigate the effect of outliers, all the continuous variables are winsorised at 5^{th} and 95^{th} percentile.

Table 7.19 reports some predicted and some unpredicted associations between abnormal-impairment losses, variables for earnings-management incentives and corporate-governance mechanisms. Negative abnormal-impairment losses are supposed to be associated with earnings-management incentives to avoid and/or delay recognition of impairment losses, whereas positive abnormal-impairment losses are supposed to be associated with incentives to accelerate and/or overstate recognition of impairment losses. However, hypotheses are not limited to predict associations between earnings-management incentives and either understated or overstated impairment losses. Rather, for a given incentive, they predict associations between this incentive and both understated and overstated impairment losses (See hypotheses 4a to 4r). The absolute size of abnormal impairment losses, that is, the degree of misrepresentation, is believed to be constrained by corporate-governance mechanisms (e.g. Warfield et al. 1995, Dechow et al. 1996, Beasley 1996, Chtourou et al. 2001, Klein 2002, Koh 2003, Xie et al. 2003, Peasnell et al. 2005, Mulgrew and Forker 2006, Ebrahim 2007). This suggests that stronger and more efficient corporate-governance mechanisms should be associated with less abnormal-impairment losses (See hypotheses 4s to 4al).

Elements of the remuneration package such as cash-bonus payments, conditional stocks and stock options are predicted to reflect incentives for reporting understated impairment losses (See hypotheses 4a, 4c and 4e). If impairment losses are overstated, these remuneration variables are predicted to be associated with less overstated impairment losses (See hypotheses 4b, 4d and 4f).

Table 7.19 provides limited support for these hypotheses. Most of the associations are insignificant. Among those associations which are significant, some are significantly negative, whereas others are significantly positive. COB, CEO and CFO cash-bonus payments *(COB_BON, CEO_BON, CFO_BON)* are supposed to be negatively associated with impairment losses (e.g. Beatty and Weber 2006, Lapointe-Antunes et al. 2008, Ramanna and Watts 2009). These cash-bonus payments are, therefore, predicted to be negatively associated with understated (take negative values) *(AB_IMP_NEG)* and negatively associated with overstated impairment losses *(AB_IMP_POS)*. Table 7.19 shows that none of the associations between these cash-bonus payments and understated impairment losses are statistically significant. The results are unchanged when financial-recession observations are excluded (See table B4). Somewhat different results, however, are found when abnormal-impairment losses *(AB_IMP_NEG, AB_IMP_POS)* are estimated on alternative sets of economic variables. If normal, and thereby, abnormal-impairment losses are estimated on stock returns *(RET)* and book-to-market ratios *(BM)*, CFO cash-bonus payments *(CFO_BON)* are close to be significantly negatively associated with understated impairment losses (See table B5). Surprisingly, CEO cash-bonus payments *(CEO_BON)* are found to be positively associated with understated impairment losses *(AB_IMP_NEG)* when regressions are run on winsorised variables (See table B5). Somewhat weaker results are found for COB cash-bonus payments *(COB_BON)*. The coefficient on COB cash-bonus payments *(COB_BON)* is barely insignificantly positive (See table B5). Stronger results are found when normal and abnormal-impairment losses are estimated on a broader set of firm-level economic variables *(RET, ΔSALES%, ΔROA*, *ΔOCF%, BM)*. CFO cash-bonus payments *(CFO_BON)* are now significantly negatively associated with understated impairment losses *(AB_IMP_NEG)*, whereas COB cash-bonus payments *(COB_BON)* and CEO cash-bonus payments *(CEO_BON)* are positively associated with understated impairment losses *(AB_IMP_NEG)* (See table B6). The coefficient on COB cash-bonus payments *(COB_BON)* is significant when regressions are run on non-winsorised variables, whereas CEO cash-bonus payments and CFO cash-bonus payments are significant when regressions are run on winsorised variables. Taking these results together, they provide some support for a negative association between CFO cash-bonus payments *(CFO_BON)* and understated impairment losses *(AB_IMP_NEG)*. No support is found for a negative association between COB cash-bonus payments *(COB_BON)*, CEO cash-bonus payments *(CEO_BON)*, respectively, and understated impairment losses *(AB_IMP_NEG)*. Hypothesis 4a is, therefore, to some extent supported for CFO cash-bonus payments, but not COB and CEO cash-bonus payments.

Some predicted and some unpredicted associations are also found between cash-bonus payments and overstated impairment losses. CFO cash-bonus payments *(CFO_BON)* are negatively associated with overstated impairment losses *(AB_IMP_POS)*, which is consistent with predictions in hypothesis 4b. A positive regression coefficient, however, is found on COB cash-bonus payments *(COB_BON)* when regression is run on non-winsorised variables and CEO cash-bonus payments *(CEO_BON)* when regression is run on winsorised variables (See table 7.19). These results are unpredicted. If financial-recession observations are excluded, the coefficients on COB cash-bonus payments *(COB_BON)* and CEO cash-bonus payments *(CEO_BON)* turn insignificant, whereas the coefficient on CFO cash-bonus payments *(CFO_BON)* remains significantly negative (See table B4). When normal and abnormal-impairment losses are estimated on stock returns *(RET)* and book-to-market ratios *(BM)*, the results are somewhat more significant than those reported in table 7.19. Both COB cash-bonus payments *(COB_BON)* and CEO cash-bonus payments *(CEO_BON)* are positively associated with overstated impairment losses, while CFO cash-bonus payments *(CFO_BON)* are negatively associated with these losses (See table B5). Also somewhat stronger results than those reported in table 7.19 are found when normal and abnormal-impairment losses are estimated on a broader set of firm-level economic variables (See table B6). The above results suggest that CFO cash-bonus payments are negatively associated with overstated impairment losses. Hypothesis 4b is, therefore, supported for CFO cash-bonus payments, but not COB and CEO cash-bonus payments.

The significantly positive coefficients on COB and CEO cash-bonus payments, however, are rather puzzling. These positive associations are basically found between COB and CEO cash-bonus payments and overstated impairment losses, when these overstated losses are estimated on alternative sets of economic variables (See table B5 and table B6). Results reported in the previous section suggest that COB cash-bonus payments *(COB_BON)* have no associations with levels or changes in earnings-per-share or any other earnings measure. Besides, the COBs that actually receive bonus payments have some special characteristics. They generally serve as both COBs and CEOs and have held their position as COBs longer than the average COB. This raises the question whether these bonus payments are related to earnings at all.

This does not explain, however, any positive association between CEO cash-bonus payments *(CEO_BON)* and overstated impairment losses *(AB_IMP_POS)*. A closer investigation is, therefore, needed. In the asset-impairment literature the bonus-plan hypothesis (e.g. Watts and Zimmerman 1986, 1990) is usually tested by including an indicator variable for bonus payment or a variable which equals the actual bonus payment scaled by fixed salary as explanatory variables of impairment losses (e.g. Beatty and Weber 2006, Lapointe-Antudes et al. 2008, Ramanna and Watts 2009). These tests are based on the assumption that there exists a simple linear relationship between the bonus payments and the earnings-based bonus target. This test design, however, fails to reflect the more complex structure usually found in earnings-based compensation contracts. In order to receive a bonus payment, the bonus target, e.g. earnings-per-share, must exceed a lower bound for bonus payment. In some cases, the contract also involves an upper bound which determines the maximum bonus payment. For instance, Healy (1985) reports that when earnings fall between the upper and the lower bound, managers tend to make earnings-increasing decisions. When earnings are expected to be either above the upper bound or below the lower bound, managers shift earnings to future periods to maximise the expected bonus payment. Similar results are reported by Gaver et al. (1995) and Holthausen et al. (1995). Incentives to avoid and/or delay impairment losses are, therefore, present only when earnings are expected to fall between the lower and the upper bound of bonus payment. In other cases, there might be incentives to overstate rather than understate impairment losses.

Rather than investigating the bonus payments for the current year, annual changes in bonus payments scaled by the current year's total cash compensation are used to reflect bonus-payment incentives. These variables reflect the extent to which the bonus target is reached the current and the previous year. Positive changes in bonus payments the current year suggest that earnings are higher relative to the threshold of bonus payment this year than the previous year. Negative changes in bonus payments the current year suggest the opposite, namely that earnings are lower relative to the threshold for bonus payment this year than the previous year. Significantly negative associations will be consistent with the notion that bonus payments are negatively associated with reported impairment losses. If cash-bonus payments increase, they are supposed to be associated with fewer impairment losses, smaller impairment losses and potentially understated impairment losses. A negative association is, therefore, expected between changes in cash-bonus payments and both understated and overstated impairment losses. When rerunning for the regressions in table 7.19, changes in COB cash-bonus payments *(ΔCOB_BON)* and changes in CEO cash-bonus payments *(ΔCEO_BON)* are generally insignificantly associated with understated *(AB_IMP_NEG)* and overstated impairment losses *(AB_IMP_POS)* (See table B7). There are some exceptions. COB cash-bonus payments *(ΔCOB_BON)* and understated impairment losses *(AB_IMP_NEG)* are negatively associated when the regression is run on non-winsorised variables. Changes in CFO cash-bonus payments *(ΔCFO_BON)*, however, are significantly negatively associated with both understated *(AB_IMP_NEG)* and overstated impairment losses *(AB_IMP_POS)* (See table B7). These results are consistent with the notion that impairment losses are avoided and/or understated in order to increase bonus payments.

Conditional stocks and stock options are generally not found to have significant associations with understated or overstated impairment losses. COB, CEO and CFO conditional stocks *(COB_COSTOCK, CEO_COSTOCK, CFO_COSTOCK)* are all insignificantly associated with understated *(AB_IMP_NEG)* and overstated impairment losses *(AB_IMP_POS)* in table 7.19. Similar results are found when financial-recession observations are excluded (See table B4). There are found some significant associations, however, when alternative estimates of abnormal-impairment losses are employed. If normal and abnormal-impairment losses are estimated on stock returns *(RET)* and book-to-market ratios *(BM)*, a significantly negative association is found between CFO conditional stocks *(CFO_COSTOCK)* and overstated impairment losses *(AB_IMP_POS)* (See table B5). Even stronger evidence for a negative association is found when normal and abnormal-impairment losses are estimated on firm-level economic variables (See table B6). When changes rather than levels of cash-bonus payments are included, the associations between conditional stocks and overstated and understated impairment losses are all insignificant (See table B7). Some support is, therefore, found for a negative association between CFO conditional stocks *(CFO_COSTOCK)* and overstated impairment losses *(AB_IMP_POS)*, which is consistent with predictions for CFO conditional stocks in hypothesis 4d. Hypothesis 4c, however, is rejected.

Results for stock options are in some cases consistent with predictions, in other cases not. No significant associations are found between COB stock options *(COB_OPTION)* and understated *(AB_IMP_NEG)* and overstated impairment losses *(AB_IMP_POS)* (See table 7.19). These results, however, are not robust to alternative estimates of abnormal-impairment losses. If abnormal-impairment losses are estimated on stock returns *(RET)* and book-to-market ratios *(BM)*, the association between COB stock options *(COB_OPTION)* and understated impairment losses turns significantly positive (See table B5). Moreover, if abnormal-impairment losses are estimated on firm-level economic variables, COB stock options *(COB_OPTION)* are found to be positively associated with understated impairment losses *(AB_IMP_NEG)* and negatively associated with overstated impairment losses *(AB_IMP_POS)* when these regressions are run on non-winsorised variables (See table B6). Taken together, no support is found for a negative association between COB stock options *(COB_OPTION)* and understated and overstated impairment losses. This is inconsistent with predictions for COB stock options in hypotheses 4e and 4f.

CEO stock options *(CEO_OPTION)* are in some cases found to be insignificantly associated with understated and overstated impairment losses and in other cases significantly negatively associated. The latter results are consistent with predictions in hypotheses 4e and 4f. CEO stock options *(CEO_OPTION)* are found to be negatively associated with understated impairment losses *(AB_IMP_NEG)* when regressions are run on non-winsorised variables and negatively associated with overstated impairment losses *(AB_IMP_POS)* when regressions are run on winsorised variables (See table 7.19). A significantly negative association is also found between CEO stock options *(CEO_OPTION)* and understated impairment losses *(AB_IMP_NEG)* when regressions are run on a sample of firm years without financial-recession observations (See table B4). This result is limited to the regression with non-winsorised variables. If abnormal-impairment losses are estimated on alternative sets of economic variables, the coefficient on CEO stock options *(CEO_OPTION)* turns insignificant (See table B5 and table B6).

Rather surprising results, however, are found for CFO stock options *(CFO_OPTION)*. The association between these stock options and and overstated impairment losses *(AB_IMP_POS)* are generally positive, which is unpredicted. The association between these stock options and understated impairment losses *(AB_IMP_NEG)* is negative, however, consistent with predictions (See table 7.19). These results, however, are to some extent driven by financial-recession observations. When these observations are excluded, the associations generally turn insignificant. The only exception is the association between these stock options and overstated impairment losses *(AB_IMP_POS)* when the regression is run on winsorised variables (See table B4). This might suggest that the surprising positive association CFO stock options and overstated impairment losses might be driven by firms with CFOs receiving substantial amounts of stock options in the years prior to the financial-recession year 2008. Postive associations between CFO stock options *(CFO_OPTION)* and understated *(AB_IMP_NEG)* and overstated impairment losses *(AB_IMP_POS)* are also found when alternative estimates of abnormal-impairment losses are employed (See table B5 and table B6). A positive association is also found between CFO stock options *(CFO_OPTION)* and overstated impairment losses *(AB_IMP_POS)* when changes rather than levels of cash-bonus payments are included in the regressions (See table B7). Taken together, some weak support is found for a negative association between CEO stock options and understated impairment losses, which is consistent with predictions in hypothesis 4e. No support, however is found for hypothesis 4e concerning COB stock options and CFO stock options. And finally, no support is found for negative associations between stock options and overstated impairment losses. Hypothesis 4f is, therefore, rejected.

The reporting-strategy variable, big bath *(BATH)*, is predicted to be negatively associated with understated *(AB_IMP_NEG)* and overstated impairment losses *(AB_IMP_POS)*, whereas smoothing *(SMOOTH)*, is predicted to be positively associated with understated *(AB_IMP_NEG)* and overstated impairment losses *(AB_IMP_POS)* (See hypotheses 4i to 4l). If there are large negative changes in pre-impairment net earnings, the big-bath hypothesis predicts that impairment losses will be relatively larger. Similarly, if there are large positive changes in pre-impairment net earnings, the income-smoothing hypothesis predicts relatively larger impairment losses (e.g. Zucca and Campbell 1992, Francis et al. 1996, Rees et al. 1996, Massoud and Raiborn 2003, Riedl 2004). Both reporting strategies will potentially lead to the recognition of overstated impairment losses. Some evidence is consistent with these predictions, whereas other evidence is inconsistent. Table

7.19 reports a significantly negative association between the smoothing proxy *(SMOOTH)* and understated impairment losses *(AB_IMP_NEG)* when regressions are run on non-winsorised variables. This is inconsistent with hypothesis 4k. A negative association is also found between the big-bath proxy *(BATH)* and overstated impairment losses *(AB_IMP_POS)* when regressions are run on winsorised variables, which is consistent with predictions in hypothesis 4j (See table 7.19). Excluding financial-recession observations has basically no influence on the results in table 7.19. The smoothing proxy *(SMOOTH)* is negatively associated with understated impairment losses *(AB_IMP_NEG)*, and the big-bath proxy *(BATH)* is negatively associated with overstated impairment losses *(AB_IMP_POS)* (See table B4). Alternative estimates of abnormal-impairment losses and some of the explanatory variables, however, do have substantial effect on the results in table 7.19. When abnormal-impairment losses are estimated on stock returns *(RET)* and book-to-market ratios *(BM)*, the smoothing proxy *(SMOOTH)* becomes positively associated with understated impairment losses *(AB_IMP_NEG)*, which is consistent with hypothesis 4k (See table B5). Inconsistent with predictions, however, the big-bath proxy *(BATH)* is now significantly positively associated with both understated *(AB_IMP_NEG)* and overstated impairment losses *(AB_IMP_POS)*. These results are again somewhat altered when abnormal-impairment losses are estimated on firm-level economic variables (See table B6). The smoothing proxy *(SMOOTH)* is, still, significantly positively associated with understated impairment losses *(AB_IMP_NEG)*. The other associations between big-bath proxy *(BATH)*, smoothing proxy *(SMOOTH)* and impairment losses are now insignificant (See table B6). And finally, results consistent with those reported in table 7.19 for big-bath proxy *(BATH)* and smoothing proxy *(SMOOTH)* are found when alternative cash-bonus variables are employed (See table B7). As demonstrated above, the results for these reporting-strategy variables are not very robust. This suggests that hypotheses 4i to 4l should all be rejected.

Impairment losses are expected to be associated with management changes. Prior literature has demonstrated that impairment losses are more likely in years with such changes and that these impairment losses on average are larger and potentially overstated (e.g. Strong and Meyer 1987, Francis et al. 1996, Riedl 2004, Kvaal 2005, Zang 2008). Consistent with these predictions, a significantly positive association is found between CEO changes *(ΔCEO)* and overstated impairment losses *(AB_IMP_POS)* (See table 7.19). This result is limited to winsorised variables. COB changes *(ΔCOB)*, however, are found to be negatively associated with overstated impairment losses *(AB_IMP_POS)*, which is inconsistent with predictions. When financial-recession observations are excluded, no significant associations are found between management changes and understated *(AB_IMP_NEG)* and overstated impairment losses *(AB_IMP_POS)* (See table B4). More supportive results are found when abnormal-impairment losses are estimated on stock returns *(RET)* and book-to-market ratios *(BM)*. CEO changes *(ΔCEO)* are now significantly positively associated with both understated *(AB_IMP_NEG)* and overstated impairment losses *(AB_IMP_POS)* (See table B5). Similar results are found when these losses are estimated on a broader set of firm-level economic variables (See table B6). A positive association between CEO changes *(ΔCEO)* and overstated impairment losses *(AB_IMP_POS)* is also demonstrated when changes rather than levels of cash-bonus payments are used as explanatory variables (See table B7). Some weak results are found for a negative association between COB changes *(ΔCOB)* and overstated impairment losses *(AB_IMP_POS)* (See table 7.19, table B6 and table B7). These results are limited to non-winsorised variables. Taken together, the above results support a positive association between CEO changes and understated and overstated impairment losses. This is consistent with hypotheses 4m and 4n. No support, however, is found for positive associations between other management changes and understated or overstated impairment losses. This suggests that hypotheses 4m and 4n should be rejected for COB changes and CFO changes.

Higher debt-to-equity *(DEBT)* is predicted to be associated with fewer impairment losses, smaller impairment losses and potentially understated impairment losses. Debt-to-equity is believed to be positively associated with the risk of violating debt covenants (e.g. Watts and Zimmerman 1978, 1986, 1990, Beneish and Press 1993, Sweeney 1994, DeFond and Jiambalvo 1994, Dichev and Skinner 2002, Kvaal 2005, Zang 2008, Ramanna and Watts 2009). This suggests that debt-to-equity ratios *(DEBT)* should be negatively associated with understated *(AB_IMP_NEG)* and overstated impairment losses *(AB_IMP_POS)*. Table 7.19, however, indicates that debt-to-equity *(DEBT)* is positively rather than negatively associated with overstated impairment losses *(AB_IMP_POS)*. Even stronger results for a positive association between debt-to-equity ratios *(DEBT)* and overstated impairment losses *(AB_IMP_POS)* are found when financial-recession observations are excluded (See table B4). Similar results to those reported in table 7.19 are found when alternative specifications are employed for bonus-incentive variables (See table B7). Mixed results, however, are reported when regressions are run on alternative estimates of abnormal-impairment losses (See table B5 and table B6).

There might be more than one reason for these results. One explanation is that the positive association between debt-to-equity ratios *(DEBT)* and overstated impairment losses *(AB_IMP_POS)* are driven by firms being financially distressed. An indicator variable, which equals 1 when debt-to-equity ratios are above the 75th percentile of that variable and otherwise 0, is employed instead of the conventional debt-to-equity ratio *(DEBT)*. As demonstrated in the previous section, this indicator variable is negatively associated with stock returns, which suggests that firms with high debt-to-equity might be financially distressed. Splitting the firm-year observations on this indicator variable, however, does not support the notion that the positive association between debt-to-equity *(DEBT)* and overstated impairment losses *(AB_IMP_POS)* is driven by firms with high debt-to-equity ratios. An insignificantly negative association is found between debt-to-equity *(DEBT)* and overstated impairment losses *(AB_IMP_POS)* when the regression is run on firm years with high debt-to-equity (t-value: -0.77) (Results are not tabulated). When running this regression on firm years with debt-to-equity below the 75th percentile, the association is insignificantly positive (t-value: 1.07) (Results are not tabulated). Thus, the positive association between debt-to-equity ratios and overstated impairment losses remains a puzzle. Nevertheless, these results are inconsistent with predictions in hypotheses 4o and 4p.

Firm size (*lnSIZE_MV)* is found to be negatively associated with overstated impairment losses *(AB_IMP_POS)*. This suggests that impairment losses are less overstated in large firms compared to small firms, which is inconsistent with predictions in hypothesis 4r. Still, this is consistent with the notion that larger firms have less misrepresentation and higher accounting quality. No significant association is found between firm size (*lnSIZE_MV)* and understated impairment losses *(AB_IMP_NEG)* in table 7.19. These results are not robust to the exclusion of firm-year observations or alternative estimates of abnormal-impairment losses. When financial-recession observations are excluded, the significantly negative association in table 7.19 turns insignificantly negative (See table B4). Alternative estimates of abnormal-impairment losses have some effect on the results in table 7.19. Firm size (*lnSIZE_MV)* is now positively associated with understated impairment losses *(AB_IMP_NEG)*, which is consistent with hypothesis 4q (See table B5 and table B6). At the same time, no significantly positive association is found between firm size (*lnSIZE_MV)* and overstated impairment losses *(AB_IMP_POS)*, which is inconsistent with hypothesis 4r. And finally, negative associations are found between firm size (*lnSIZE_MV)* and understated *(AB_IMP_NEG)* and overstated impairment losses *(AB_IMP_POS)* when changes rather than levels of cash-bonus payments are included in the regressions (See table B7). Taken together, this suggests that larger firms are less inclined to overstate and to some extent understate impairment losses in goodwill. This might be consistent with the notion that larger firms have higher accounting quality. Nevertheless, the above results reject hypotheses 4q and 4r.

Corporate-governance structures are believed to constrain opportunism and the extent of misrepresentation in financial accounting (e.g. Warfield et al. 1995, Dechow et al. 1996, Beasley 1996, Chtourou et al. 2001, Klein 2002, Koh 2003, Xie et al. 2003, Peasnell et al. 2005, Mulgrew and Forker 2006, Ebrahim 2007). Strong corporate-governance mechanisms are, therefore, supposed to be associated with less misrepresentation of impairment losses. Most corporate-governance variables are found to be insignificantly associated with understated and overstated impairment losses (See table 7.19). Only one corporate-governance variable is associated with understated impairment losses *(AB_IMP_NEG)* and that is cross-listing *(CROSS)*. Firms that are cross-listed on the New York Stock Exchange or the NASDAQ Stock Exchange seem to understate impairment losses to a less extent than the average sample firm. This is indicated by a positive association between cross-listing *(CROSS)* and understated impairment losses *(AB_IMP_NEG)* (See table 7.19). A positive association is also found when financial-recession observations are excluded (See table B4) and when alternative specifications of cash-bonus variables are employed (See table B7). The results in table 7.19, however, are sensitive to alternative estimates of abnormal-impairment losses (See table B5 and table B6). The associations between cross-listing *(CROSS)* and understated impairment losses turn insignificant when abnormal-impairment losses are estimated on stock returns *(RET)* and book-to-market ratios *(BM)* (See table B5) or firm-level economic variables (See table B6). Taken together, the above evidence provides some support for hypothesis 4ak.

None of the other corporate-governance variables are associated with understated impairment losses in table 7.19, but some significant associations between these variables and understated impairment losses are found in robustness tests and these should be commented. For instance, board size *(lnBOARD_SIZE)* is found to be negatively associated with understated impairment losses when abnormal-impairment losses are estimated on stock returns *(RET)* and book-to-market ratios *(BM)* (See table B5) and firm-level economic variables (See table B6). These associations, however, are insignificant when alternative specifications of cash-bonus payments are employed as explanatory variables (See table B7). A negative association is inconsistent with predictions in hypothesis 4s. This suggests that firms with larger boards tend to understate impairment losses more than firms with smaller boards. These results, however, are limited to alternative estimates of abnormal-impairment losses and should, therefore, be interpreted with caution.

Some significant associations are also found between COB stockholdings *(COB_STOCK)*, CEO stockholdings *(CEO_STOCK)* and understated impairment losses *(AB_IMP_NEG)*. A positive association is found between COB stockholdings *(COB_STOCK)* and understated impairment losses *(AB_IMP_NEG)* when abnormal-impairment losses are estimated on stock returns *(RET)* and book-to-market ratios *(BM)* (See table B5). Similar results are found for COB stockholdings when abnormal-impairment losses are estimated on firm-level economic variables (See table B6). These results provide some support for hypothesis 4y. However, CEO stockholdings *(CEO_STOCK)* are found to be negatively associated with understated impairment losses in table B5 and table B6. This suggests the opposite of what is predicted. Firms with CEOs holding more stocks generally understate impairment losses in goodwill. This evidence is, therefore, inconsistent with predictions for CEO stockholdings in hypothesis 4y. There is also some evidence suggesting that larger audit committees *(lnAUDIT_SIZE)* are associated with more understated impairment losses *(AB_IMP_NEG)*. This evidence, however, is limited to alternative estimates of abnormal-impairment losses when regressions are run on winsorised variables (See table B5 and table B6). A negative association is also found between the number of audit-committee meetings *(lnAUDIT_MEET)* and understated impairment losses *(AB_IMP_NEG)* when financial-recession observations are excluded (See table B6) and when alternative specifications are used for bonus-incentive variables (See table B7). This evidence is not very robust and should be interpreted with caution. And finally, a positive association, consistent with predictions in hypothesis 4ag, is found between cumulative percentage of blocholdings *(BLOCK%)* and understated impairment losses *(AB_IMP_NEG)*. This result, however, is only found when alternative bonus-incentive variables are employed (See table B7). Taken together, limited support is found for predicted associations between corporate-governance variables and understated impairment losses. This suggests that all hypotheses concerning associations between corporate-governance variables and understated impairment losses should be rejected except hypothesis 4ak which predicts a positive association between cross-listing and understated impairment losses.

Stronger results are found for corporate-governance variables and overstated impairment losses. Board size *(lnBOARD_SIZE)* is found to be significantly positively associated with overstated impairment losses *(AB_IMP_POS)* (See table 7.19), which is inconsistent with predictions in hypothesis 4t. Even stronger evidence of a positive association is found when changes rather than levels of cash-bonus payments are used as explanatory variables (See table B7). The results in table 7.19, however, are sensitive to the exclusion of financial-recession observations (See table B4) and alternative estimates of abnormal-impairment losses (See table B5 and table B6). Taken together, this suggests that hypothesis 4t should be rejected. Similar positive associations are found between independent non-executive directors *(NONEXE)* and overstated impairment losses *(AB_IMP_POS)*. More independent non-executive directors on the board are associated with more overstated impairment losses (See table 7.19). These findings, however, are limited to the main results in table 7.19 and the robustness results where changes rather than levels of cash-bonus payments are used as explanatory variables (See table B7). Hypotheses 4v is, therefore, rejected. Number of board meetings *(lnBOARD_MEET)* is generally found to be insignificantly associated with overstated impairment losses *(AB_IMP_POS)*. There are two exceptions suggesting a negative association between number of board meetings and overstated impairment losses. The first exception is found in main results (See table 7.19) and the second exception is found when changes rather than levels of cash-bonus payments are used as explanatory variables (See B7). This latter evidence is considered too weak to support a negative association between board meetings and overstated impairment losses as predicted in hypothesis 4x.

COB, CEO and CFO stockholdings *(COB_STOCK, CEO_STOCK, CFO_STOCK)* have no significant associations with overstated impairment losses *(AB_IMP_POS)* (See table 7.19). These results, however, are not robust to alternative estimates of abnormal-impairment losses. When these losses are estimated on stock returns *(RET)* and book-to-market ratios *(BM)*, a positive coefficient is found on COB stockholdings *(COB_STOCK)* and a negative coefficient is found on CEO stockholdings *(CEO_STOCK)* and CFO stockholdings *(CFO_STOCK)* (See table B5 and table B6). When changes rather than levels of cash-bonus payments are employed, the associations between managerial stockholdings and overstated impairment losses are generally insignificant (See table B7). This provides some weak support that CEO and CFO stockholdings are associated with less overstated impairment losses, which is consistent with hypothesis 4z.

Audit-committee characteristics are generally found to be insignificantly associated with overstated impairment losses. Somewhat surprisingly, no significant association is found between the indicator variable for financial-accounting expert *(ACCEXP)* and overstated impairment losses *(AB_IMP_POS)*. This result is very robust (See table B4 to table B7). This suggests that having a financial-accounting expert on the audit committee does not prevent misrepresentation of impairment losses. Hypothesis 4ab should, therefore, be rejected. Audit-committee size measured by number of audit-committee meetings *(lnAUDIT_SIZE)* is insignificantly associated with overstated impairment losses *(AB_IMP_POS)* in table 7.19. This result is sensitive to alternative estimates of abnormal-impairment losses (See table B5 and table B6). When alternative estimates of abnormal-impairment losses are employed, larger audit committees are found to be associated with less overstated impairment losses, which is consistent with predictions in hypothesis 4ad. A negative association, however, is only found when these alternative estimates are employed. This suggests that hypothesis 4ad should be rejected. Audit-committee activity measured by number of audit-committee meetings *(lnAUDIT_MEET)* is found to be positively associated with overstated impairment losses (See table 7.19). This result is rather robust. It is robust to the exclusion of financial-recession observations (See table B4) and to alternative estimates of abnormal-impairment losses (See table B5 and table B6). This suggests that firms with more audit-committee activity generally overstate impairment losses in goodwill. This evidence is surprising as it suggests that more audit-committee activity leads to more rather than less misrepresentation of goodwill-impairment losses. One potential explanation is conservative accounting. Conservatism is seen as a remedy to constrain the tendency to opportunistically overstate net earnings and net-asset values (e.g. Watts 2003). A more active audit committee may lead to more conservative accounting, and thereby, potentially overstated impairment losses. Nevertheless, these results reject hypothesis 4af.

Cumulative percentage of blockholdings *(BLOCK%)* is not found to be associated with overstated impairment losses in any of the regressions, which rejects hypothesis 4ah. Number of blockholders *(lnBLOCK_NUM)*, however, is found to be negatively associated with overstated impairment losses (See table 7.19). A negative association is also found when alternative specifications are employed for bonus-incentive variables (See table B7). The associations turn, however, insignificant when financial-recession observations are excluded (See table B4), and when alternative estimates of abnormal-impairment losses are used as dependent variables (See table B5 and table B6). Taken together, these results provide some support for hypothesis 4aj that more blockholders are associated with less overstated impairment losses. And finally, the indicator variable for cross-listing *(CROSS)* is not found to be associated with overstated impairment losses in the main results (See table 7.19). Some significant associations, however, are found in robustness tests. A significantly positive association is found when financial-recession observations are excluded (See table B4). Similar results are reported when alternative estimates of abnormal-impairment losses are employed (See table B5 and table B6). These associations, however, turn insignificant when alternative specifications are employed for bonus-incentive variables (See table B7). This indicates that cross-listed firms overstate impairment losses in goodwill. The reason why this association is positive, rather than negative, might be that cross-listing leads to more conservative accounting. Like audit-committee activity *(lnAUDIT_MEET)*, a positive association may signify that these firms follow more conservative accounting principles, which leads to potentially overstated impairment losses. Nevertheless, the above results reject hypothesis 4al.

The results from this section suggest that understated and overstated impairment losses have some associations with variables reflecting earnings-management incentives and corporate-governance mechanisms. There is, for instance, a tendency that firms paying large cash-bonus payments to CFOs and/or CEOs that hold more stock options generally understate goodwill-impairment losses. There is also some evidence suggesting that CEO changes are associated with less understated and more overstated impairment losses. These results indicate that misrepresentation of impairment losses might reflect reporting incentives triggered by CEO and CFO remuneration and CEO changes. There is found limited evidence suggesting that misrepresentation of impairment losses is constrained by corporate-governance mechanisms. There are some exceptions, however. Higher CEO and CFO stockholdings are found to be associated with less overstated impairment losses. Other corporate-governance mechanisms, however, are found to be associated with more overstated impairment losses. This is the case for board size, audit-committee activity and cross-listing. A positive association between board characteristics, cross-listing and overstated impairment losses might be the result of conservative accounting. Stronger monitoring performed by the board and the audit committee along with cross-listing at stock exchanges with strict disclosure regulations and enforcement, may lead to more conservative and potentially overstated impairment losses.

8. Discussion, conclusion and future research

This dissertation investigates the decision usefulness of goodwill-accounting number under current IFRS. Decision usefulness is interpreted as the extent to which these numbers reflect relevant and reliable information for equity valuation. The argument put forward by the leading standard setters, IASB and FASB, is that the new impairment-only method provides more decision-useful information than the previous amortisation-and-impairment method. Three not mutually exclusive factors are essential when it comes to decision usefulness of accounting numbers: the extent to which accounting numbers reflect economic fundamentals, the measurement uncertainty in these numbers and the risk of opportunistic earnings management in these numbers (e.g. Wilson 1996, Healy and Wahlen 2001).

The impairment-only method is based on a screening test where goodwill is impaired only if the total of purchased and internally-generated goodwill no longer can justify book goodwill. This test procedure does not distinguish remaining purchased goodwill from internally-generated goodwill, which may lead to indirect capitalisation of internally-generated goodwill. Some of the accounting asymmetry between purchased and internally-generated goodwill is, therefore, removed. This suggests that the impairment-only method gives room for more faithful representation of total goodwill than the previous amortisation method, which improves decision usefulness. However, the lack of verifiability and the risk of opportunistic earnings management in these reported losses may impair reliability, relevance and decision usefulness of these goodwill numbers (Watts 2003, Ramanna 2008, Ramanna and Watts 2009).

Goodwill-amortisation charges are believed to be void of any decision usefulness (e.g. Jennings et al. 2001, Moehrle et al. 2001). The reason for this claim is not that purchased goodwill is supposed to have unlimited economic lifetime. Rather, the reason is found in considerable measurement challenges when determining the pattern and the time period over which goodwill is consumed (IASB 2004b, 2004d). Still, some guidance might be found for the estimation of these amortisation charges. Purchased goodwill, as all other assets, represents expected future benefits. On acquiring these benefits, the managers will have some expectations as to the period and the pattern over which these benefits are to be received. These expectations may serve as reference when choosing the amortisation period and amortisation method for goodwill.

Three lines of literature serve as theoretical and methodological foundation for this dissertation: value relevance and information-content literature, earnings-management literature and literature investigating the link between corporate governance and earnings management. The value-relevance methodology provides tests of relevance and to some extent reliability of accounting numbers by examining associations between these numbers and stock prices or stock returns (e.g. Barth 2000, Barth et al. 2001, Beaver 2002). Demonstrated value relevance suggests that accounting numbers provide information reflected in the capital market, that is, information that has valuation usefulness. Still, it is important to emphasise that demonstrated value relevance is not sufficient to make accounting-policy recommendations (e.g. Barth 2000, Scott 2012:153).

This dissertation provides evidence on value relevance of goodwill numbers reported under alternative accounting methods. This evidence is believed to provide some aid and support on standard setters' accounting decisions regarding goodwill. Goodwill-accounting numbers reported under the impairment-only method (current IFRS) is found to be value relevant. Book goodwill is positively associated with stock prices, and goodwill-impairment losses are negatively associated with stock prices and stock returns. This suggests that both book goodwill and goodwill-impairment losses provide incremental value-relevant information to book equity (less book goodwill) and net earnings (less goodwill-impairment losses). It also suggests that goodwill-impairment losses are not totally unreliable although accounting for these losses involves significant discretion. These results are robust to alternative time lags in stock prices and stock returns and alternative remedies to mitigate scale effects. In sum, the impairment-only method provides information that are relevant, timely and sufficient reliable to be reflected in stock prices. This suggests that the accounting numbers reported under this method provide useful information.

With reference to prior research, goodwill-amortisation charges are predicted to lack any associations with stock prices and stock returns, which suggests that these charges are void of any relevant information (e.g. Jennings et al. 2001, Moehrle et al. 2001). Inconsistent with predictions, however, these charges are found to be significantly associated with stock prices and stock returns. More surprisingly, the associations are significantly positive, not negative, which suggests that these charges do not reflect economic charges. Somewhat similar results are also found in prior literature, but are generally explained by potential econometrical problems, for instance, the influence of scale effects (Huigjen 1996, Vincent 1997, Jennings et al. 2001, Petersen 2002). A careful investigation of scale effects, however, suggests that these results are not driven by insufficient correction for scale. Rather, additional analysis reveals that goodwill-amortisation charges are driven by firms that have high economic performance, high economic growth or firms not reporting goodwill-impairment losses. The sample firms are assigned to three groups: a group with high economic performance or growth, medium economic performance or growth and low economic performance or growth. Variables used to reflect performance are stock returns and return-on-assets, and variables used to reflect growth are growth in sales and market-to-book ratios. A significantly positive association is found between goodwill-amortisation charges and stock prices for firms with high performance and/or growth. For firms with low performance and/or growth, the coefficient on goodwill-amortisation charges are in some cases insignificantly positive, in other cases insignificantly negative and in yet other cases barely insignificantly negative. This suggests that for firms with high performance and/or growth goodwill-amortisation charges proxy for some unrecognised economic assets or more generally an unrecognised economic value. A likely candidate is the economic value of internally-generated goodwill. For some firms with low performance and/or growth, goodwill-amortisation charges seem to reflect economic charges. And finally, cumulative goodwill-amortisation charges are found to be positively associated with stock prices, suggesting that the amortisation method leads to over-amortisation of goodwill (Kang and Zhao 2010). Along with the impairment-only method and the amortisation method, an accounting method combining amortisation and impairment testing is investigated. This method provides similar results as those found for the impairment-only method and the amortisation method. A significantly negative coefficient is found on goodwill-impairment losses, whereas a significantly positive coefficient is found on goodwill-amortisation charges. Neither goodwill-impairment losses nor goodwill-amortisation charges are pre-emptied of significance when explaining stock prices and stock returns.

The relative decision usefulness is tested by comparing value relevance of goodwill numbers reported under the impairment-only method with value relevance of goodwill numbers reported under alternative methods. The comparison is conducted by employing as-accounted numbers under the impairment-only method and as-if accounted numbers under four alternative methods: impairment-only method (current IFRS), amortisation-only method, amortisation-and-impairment method and permanent retention. The amortisation period is the one applied by the firms prior to IFRS adoption. The accounting method with no amortisation and impairment testing is the one providing least value-relevant information. Adjusted R-squares when employing this method are significantly lower than adjusted R-squares from any other accounting method for goodwill. This suggests that any other method than permanent retention of book goodwill is better at explaining variations in stock prices and stock returns. The other comparisons do not provide as clear order of preference. Still, some indications might be found. The impairment-only method is not superior to the amortisation or the combined amortisation-and-impairment method. Rather, some of the results indicate that an accounting method with amortisation and impairment testing provides accounting numbers that better explain variations in stock prices and stock returns. Still, this does not imply that the amortisation method (or a combined method) is better in terms of faithful representation of economic fundamentals than the impairment-only method. As argued previously in this chapter, amortisation charges do not seem to reflect economic charges. They rather seem to proxy for some unrecognised economic assets or some unrecognised economic value, which means that reporting these as charges is inconsistent with faithful reporting. However, for some firms with low economic performance and/or growth, there are indications that goodwill-amortisation charges might reflect economic charges. But in these cases, the reduction in economic goodwill could, and perhaps should, be reflected as impairment losses rather than amortisation charges. Taken together, this suggests that the impairment-only method provides more faithful reporting of goodwill than a method with amortisation.

The value-relevance methodology is believed to be insufficient to provide evidence on the reliability of accounting numbers. Impairment testing of goodwill makes use of unverifiable fair-value estimates, which involves high measurement uncertainty and the risk of opportunistic earnings management. Thus, goodwill-impairment losses might reflect earnings-management incentives rather than economic impairment. However, the fact that goodwill-impairment losses are significantly negatively associated with stock prices and stock returns suggests that they to some extent reflect economic impairment in goodwill. Still, for certain firms and in certain situations, goodwill-impairment losses might be biased depictions of economic impairment.

Earnings-management incentives may influence the accounting for impairment losses. Two regression models are employed to investigate this influence: One model where earnings-management incentives explain the impairment decisions and another model where earnings-management incentives explain the size of impairment losses. To control for the extent to which these losses are faithfully reported, variables supposed to reflect economic impairment are included as additional variables. The results from these regressions suggest that impairment losses under current IFRS are associated with variables for economic impairment rather than earnings-management incentives. The decision to report impairment losses and the size of reported impairment losses are associated with economic variables at three different aggregation levels: macro-economic level, industry-sector level and firm level. Some rather weak evidence, however, indicates that these losses might be influenced by CFO cash-bonus payments, CFO conditional stocks, income smoothing and CEO changes. These results are sensitive to the use of winsorised or non-winsorised variables, to the exclusion of financial-recession observations and the use of alternative specifications of cash-bonus variables and conditional stock or stock-option variables. To the extent these findings are not driven by econometrical problems such as measurement errors, the lack of significance of variables for earnings-management incentives supports the claim that impairment decisions and size of impairment losses reflect economic impairment rather than earnings-management incentives. An alternative explanation of insignificant results is that the variables for earnings-management incentives suffer from non-trivial measurement errors which result in insignificant associations between these variables and impairment losses. The development of more sensitive variables for earnings-management incentives might be an exercise for future research in order to try to distinguish these two explanations of insignificant results.

The above research design does not investigate the degree of misrepresentation in goodwill-impairment losses. In order to derive a measure of misrepresentation, some inspiration is found in the idea of separating total accruals in normal and abnormal accruals and the recent contributions made by Zang (2008) and Lapointe-Antundes et al. (2008) to the asset-impairment literature. Abnormal-impairment losses are calculated as differences between reported impairment losses and estimates of normal or expected impairment losses. These normal-impairment losses are estimated as fitted values from a regression of reported impairment losses on economic variables supposed to reflect economic impairment. Any deviation from this estimate of normal-impairment losses is interpreted as evidence of either understated or overstated impairment losses.

The degree of misrepresentation in reported goodwill-impairment losses is supposed to increase in earnings-management incentives to misrepresent and decrease in the presence of corporate-governance mechanisms. Efficient corporate governance is expected to constrain opportunistic earnings management and thereby the degree of misrepresentation in goodwill-impairment losses. Corporate-governance variables for board and audit-committee characteristics are employed along with variables for managerial stockholdings, the presence of blockholders and cross-listing. The investigation reveals that most variables for earnings-management incentives lack any associations with understated or overstated impairment losses. These results are found to be rather robust to the exclusion of financial-recession observations, to alternative estimates of abnormal-impairment losses and to alternative specifications of cash-bonus variables. There is a tendency, however, that firms paying large CFO-cash bonuses generally report more understated impairment losses in goodwill. Similar evidence is found for firms with CEOs with large stock-options holdings. There is also some evidence suggesting that CEO changes are associated with less understated and more overstated impairment losses. These results suggest that misrepresentation of impairment losses might reflect reporting incentives triggered by CEO and CFO remuneration or CEO changes. Misrepresentation in reported impairment losses is to a limited extent constrained by corporate-governance mechanisms. There are some exceptions. Higher CEO and CFO stockholdings are found to be associated with less overstated impairment losses. Other corporate-governance mechanisms, however, are found to be associated with more rather than less misrepresentation. This is the case for board size, audit-committee activity and cross-listing. A positive association is found between these board characteristics, cross-listing and overstated impairment losses. Yet other corporate-governance mechanisms are not found to have any associations with understated or overstated impairment losses.

There is more than one possible explanation of these results. Historically, conservatism has been considered a qualitative characteristic of accounting (Kothari et al. 2010). A certain degree of conservatism has been considered necessary to prevent the management from overstating net earnings and net-asset values. Overstated impairment losses could, therefore, reflect conservatism. To the extent that board members, audit-committee members, blockholders and other corporate structures consider conservatism a remedy to prevent earnings management, a positive rather than a negative association might be revealed between these corporate-governance structures and overstated impairment losses. A similar argument, however, cannot be found for a negative association between these corporate-governance structures and understated impairment losses. There are also some potential explanations of insignificant coefficients on corporate-governance variables. The impairment-testing procedure for goodwill is highly technical and requires advanced expertise in financial accounting and valuation. Most board members (except the financial-accounting expert) do not hold such expertise. Moreover, impairment losses in goodwill are basically unverifiable. The impairment-testing procedure is discretionary in most of its facets. It is, therefore, difficult even for trained auditors to question the assumptions and the input information applied when conducting the impairment test (Ramanna 2008, Zang 2008, Ramanna and Watts 2009). This may explain why some of the board characteristics are found to have no associations with overstated or understated impairment losses. A last explanation is econometrical problems caused by measurement errors, confounding variables and endogeneity problems.

8.1. Conclusion

This dissertation is aimed at answering questions concerning the decision usefulness of goodwill numbers under current IFRS. This involves questions regarding the value relevance of goodwill numbers and the risk of goodwill-impairment losses being opportunistically managed. An investigation of value relevance is supposed to provide evidence on relevance and to some extent reliability of accounting numbers for equity valuation. An investigation of the risk of opportunistic earnings management is supposed to provide evidence on the reliability of reported goodwill-impairment losses. The first research question concerns the value relevance of goodwill numbers reported under current IFRS. Book goodwill is found to be positively associated with stock prices. This is consistent with the notion that book goodwill represents an economic asset which is reflected in stock prices. Goodwill-impairment losses are found to be negatively associated with stock prices and stock returns, respectively. This is consistent with the notion that these impairment losses represent economic impairment reflected in stock prices and stock returns. Goodwill numbers reported under current IFRS are, therefore, value relevant.

The second research question concerns the value relevance of goodwill numbers reported under current IFRS compared to the value relevance of goodwill numbers reported under alternative accounting methods. Four different accounting methods are investigated: impairment-only method (current IFRS), amortisation-only method, amortisation-and-impairment method and permanent retention. All methods allowing reporting of amotisation charges and/or impairment losses are better in terms of value relevance than the permanent retention method. The order of preference is not as clear when it comes to the other methods. There are some results, however, indicating that an accounting method with amortisation and impairment testing provides accounting numbers that better explain variation in stock prices and stock returns. This does not suggest, however, that a combined amortisation-and-impairment method should be preferred compared to the current impairment-only method. Amortisation charges are found to be positively associated with stock prices and stock returns, respectively. These charges are not reflecting economic charges. Reporting these charges in the profit and loss account is, therefore, inconsistent with faithful reporting.

A set of alternative tests are conducted to investigate whether this positive association might be driven by scale effects. Alternative scaling and control for scale by using the residuals from regressions of stock prices or stock returns on size have no significant effect on the positive association. Moreover, the positive association is in fact more significant when return-earnings rather than price-book earnings regressions are employed bringing further support that the positive association is not driven by scale effects. Rather, the positive association seems to be driven by firms with high performance and/or growth. Moreover, accumulated goodwill-amortisation charges are found to be positively associated with stock prices. This may suggest that these charges are reflecting economic value for instance the economic value of internally-generated goodwill. More investigation of this positive association might be an issue for future research.

Research questions three and four concern the risk of goodwill-impairment losses being opportunistically reported. Goodwill-impairment losses might reflect earnings-management incentives rather than economic impairment. The value-relevance findings suggest that impairment losses are not totally unreliable, but value relevance does not address reliability in particular. Research question three concerns the extent to which goodwill-impairment losses are associated with variables supposed to reflect economic impairment and earnings-management incentives. Both the impairment decision and size of reported impairment losses are found to be associated with variables for economic impairment. This is consistent with the value-relevance findings suggesting that these impairment losses are associated with economic impairment reflected in stock prices and stock returns. Still, for certain firms or in certain situations impairment losses might be managed. Some rather weak evidence is found that the reporting of these losses might be influenced by CFOs remuneration, incentives to smooth earnings and CEO changes. COB and CEO remuneration, COB and CFO changes, big-bath incentives and debt-contracting incentives are not found to have any predicted associations with impairment losses in goodwill. There are at least two contradicting explanations of these findings. These earnings-management incentives play no role when reporting impairment losses in goodwill or the earnings-management incentives suffer from non-trivial measurement errors which bias the results. Earnings-management incentives are not directly observable. Proxies supposed to be highly positively correlated with the unobservable incentives are, therefore, employed. The risk of substantial measurement errors is especially profound when measuring remuneration incentives, debt-covenant incentives and political-cost incentives. These incentives are reflected by rather crude proxies. The unpredicted associations should, therefore, be interpreted with caution. Still, the value-relevance findings for impairment losses and the results demonstrating predicted associations between these losses and variables supposed to reflect economic impairment, suggest that these impairment losses are not on average heavily influenced by earnings-management incentives.

Research question four concerns misrepresentation of impairment losses. Misrepresentation, not caused by accounting regulation, will probably be the result of earnings management. Earnings-management incentives are supposed to increase misrepresentation, whereas corporate-governance mechanisms are supposed to decrease misrepresentation of impairment losses. Impairment losses might be understated or overstated. Most of the results are inconsistent with the hypotheses. Variables for earnings-management incentives are generally not significantly associated with understated or overstated impairment losses. There are some exceptions. There is a tendency that firms paying large CFO cash-bonus payments generally understate impairment losses. A similar association is found between CEOs stock options and understated impairment losses. There is also some evidence suggesting that CEO changes are associated with less understated and more overstated impairment losses. These results indicate that misrepresentation of impairment losses might reflect reporting incentives triggered by CEO and CFO remuneration and CEO changes. Like variables for earnings-management incentives, variables for corporate-governance mechanisms are generally insignificantly associated with misrepresentation of impairment losses. Rather, some corporate-governance variables are found to be associated with more overstated impairment losses. This is the case for board size, audit-committee activity and cross-listing. This could be the result of conservatism. Stronger monitoring performed by the board and the audit committee along with cross-listing at stock exchanges with strict disclosure regulations and enforcement, may lead to more conservative accounting and thereby potentially overstated impairment losses. As for research question three, the above results must be interpreted with caution. The estimates of misrepresentation are based on fitted values from a regression of reported impairment losses on variables for economic impairment. Thus, the estimates of misrepresentation will, therefore, be determined by the set of variables supposed to be highly positively correlated with economic impairment. As the true impairment is unobservable, these estimates might be measured with some unobservable error. Moreover, both earnings-management incentives and corporate-governance mechanisms will likely be measured with error. It is, therefore, not absolutely clear whether unpredicted associations are the result of true unpredicted associations or measurement errors. Still, taking the results together, they support the arguments of IASB and FASB that the impairment-only method provides more decision-useful information of goodwill than the previous amortisation method. Goodwill numbers under the impairment-only method are value relevant. Moreover, goodwill-impairment losses have strong predicted associations with variables of economic impairment. Goodwill-amortisation charges have positive associations with stock prices and stock returns, which suggests that these charges are not reflecting economic charges in goodwill.

8.2. Future research

The present dissertation might be expanded in several ways. Two of these are in particular focus here: Alternative research designs and alternative specifications of some main variables. One important research finding of this dissertation is the positive association between goodwill-amortisation charges and stock prices and stock returns. The positive association is driven by firms with high performance, high growth or firms not reporting impairment losses in goodwill. One suggestion is that these amortisation charges are associated with some unrecognised assets or benefits that are reflected in stock prices and stock returns. A more careful investigation of this positive association might be an interesting avenue for future research.

A potential expansion might be to investigate whether purchased goodwill loses value relevance when goodwill becomes older. By including goodwill purchased the current year and the previous years as explanatory variables of stock prices, the size and significance of the coefficients might be used to investigate economic lifetime of purchased goodwill. If coefficients on older goodwill are discounted relative to more recent goodwill, this might be interpreted as evidence of goodwill having limited economic lifetime.

The investigation of decision usefulness of goodwill-accounting numbers is conducted in several steps in this dissertation. First, the value relevance of these impairment losses is investigated and then the associations between impairment losses, variables for economic impairment, earnings-management incentives and corporate-governance mechanisms. One step forward might be to develop a test design where value relevance of goodwill-impairment losses is investigated conditional on variables for earnings-management incentives and corporate-governance mechanisms. Such a test design would make it possible to investigate whether value relevance of goodwill-impairment losses varies by earnings-management incentives and corporate-governance mechanisms. If the capital market is sufficiently efficient, value relevance of impairment losses should be impaired in those cases where there are strong incentives to misrepresent economic impairment in goodwill. Similarly, value relevance is expected to be enhanced in those cases where there is strong corporate governance. One way to conduct such an analysis is to generate indicator variables of earnings-management incentives and corporate-governance mechanisms and include these variables as categorical moderator variables in the value-relevance regressions (e.g. Marquardt and Wiedman 2004, Aboody et al. 1999, Kallapur and Kwan 2004). To be consistent with the notion that the presence of earnings-management incentives impairs value relevance, the coefficients on interaction variables with earnings-management indicators should be significantly negative. Similarly, the coefficients on interaction variables with corporate-governance indicators should be significantly positive.

A more powerful test design should take into account the likelihood that goodwill-impairment losses are explained by variables for earnings-management incentives. One way to do this is to form indicator variables of earnings-management on the likelihood that these impairment losses are explained by variables for earnings-management incentives. The estimated probabilities from a logit regression of impairment losses on earnings-management incentives might be used to make a probability ranking. Based on this ranking, two indicator variables might be generated: One indicator which equals 1 if estimated probabilities are above the upper quartile of the probability ranking and otherwise 0 and another indicator which equals 1 if estimated probabilities are between the upper quartile and the lower quartile and otherwise 0. Impairment losses with probabilities below the lower quartile might be used as reference group. These indicator variables could next be employed as categorical moderator variables in the value-relevance regressions.

A common problem of studies investigating earnings management and corporate governance is endogeneity (e.g. Field et al. 2001, Armstrong et al. 2010). A classical example is whether variables such as CEO changes reflect earnings-management incentives or economic fundamentals. The association between CEO changes and impairment losses might be driven by the fact that firms that suffer from financial distress change CEOs and report impairment losses. Thus, the positive association between CEO changes and impairment losses might be explained by economic fundamentals rather than earnings-management incentives (Murphy and Zimmerman 1993, Fields et al. 2001). Still, the inclusion of variables for economic impairment is supposed to provide some control for this endogeneity (Francis et al. 1996, Riedl 2004). Similar examples of endogeneity problems can be found for corporate-governance mechanisms. Firms with strong corporate governance are found to have less earnings management (e.g. Warfield et al. 1995, Dechow et al. 1996, Beasley 1996, Chtourou et al. 2001, Klein 2002, Koh 2003, Xie et al. 2003, Peasnell, et al. 2005, Davidson, Goodwin-Stewart and Kent 2005, Mulgrew and Forker 2006, Ebrahim 2007, Koh, LaPlante and Tong 2007). This might be the result of endogeneity. Firms engaging in less earnings management might choose stronger corporate-governance structures because they have less to conceal (Brickley and Zimmerman 2010). If this is the case, corporate-governance structures are not the reason why these firms have less earnings management. One way to mitigate endogeneity problems is to investigate earnings management and corporate governance in more controlled settings, where, for instance, incentives for earnings management are supposed to be particularly strong.

A related problem is measurement errors in variables reflecting earnings-management incentives and corporate-governance mechanisms. Most of the employed variables are rather crude, which suggests that they may suffer from significant measurement errors (Field et al. 2001). For instance, conditional stocks and stock options might be inadequate measures of the incentives triggered by stock and option-based compensation. An ideal measure of conditional stock and stock-option incentives should reflect how sensitive managers' wealth in conditional stocks and stock options is to changes in underlying stock prices. Such direct measures are hard to obtain. An alternative would be to employ the firm's earnings-response coefficients as estimates of how sensitive the firms' stock prices are to changes in net earnings. Alternative measures might also be employed for management changes (e.g. Kvaal 2010), debt-covenant incentives (e.g. Armstrong et al. 2010) and some of the corporate-governance mechanisms (e.g Brickley and Zimmerman 2010).

The disseration could also be expanded in other ways. For instance, do firms with stronger corporate-governance structures report more and larger impairment losses? Positive associations between stronger corporate-governance structures and more and larger impairment losses might be consistent with the notion that these structures lead to more conservative accounting. Another possible extension is to investigate the value relevance and information content of abnormal-impairment losses. Do these losses reflect any value-relevant information or are they only pure noise? Are there any significant differences in value relevance between reported impairment losses, normal-impairment losses and abnormal-impairment losses? And finally, what is the information content of abnormal-impairment losses? Do abnormal-impairment losses make larger or less market responses than normal-impairment losses? Only future research can answer these questions.

Appendix A – Research question 1 and 2

Table A1 – Descriptive statistics for variables in value-relevance regressions – non-missing sample

Price-book-earnings regressions	***N***	***Mean***	***Median***	***Firs quartile***	***Third quartile***	***Standard deviation***
$P_{i,t}$	762	6.101	4.221	2.276	7.73	6.176
$(E+GIM)_{i,t}$	762	0.472	0.282	0.129	0.572	0.796
$GIM_{i,t}$	762	0.033	0	0	$1.32*10^{-4}$	0.221
$(EQ\text{-}GW)_{i,t-1}$	762	1.183	0.498	0.002	1.582	2.695
$GW_{i,t-1}$	762	1.028	0.483	0.203	1.327	1.412
$GAM_{i,t}$	762	0.072	0.035	0.015	0.094	0.093
$(EQCA\text{-}GWCA)_{i,t-1}$	762	1.183	0.498	0.002	1.582	2.695
$GWCA_{i,t-1}$	762	0.910	0.435	0.178	1.174	1.264
$GIMC_{i,t}$	762	0.026	0	0	0	0.191
$GAMC_{i,t}$	762	0.071	0.034	0.014	0.092	0.093
$(EQCAI\text{-}GWCAI)_{i,t-1}$	762	1.183	0.498	0.002	1.582	2.695
$GWCAI_{i,t-1}$	762	0.881	0.421	0.156	1.173	1.240

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Return-earnings regressions	***N***	***Mean***	***Median***	***First quartile***	***Third quartile***	***Standard deviation***
$R_{i,t}$	762	0.134	0.118	-0.150	0.339	0.484
$(E+GIM)_{i,t,t-1}$	762	0.081	0.073	0.051	0.099	0.086
$\Delta(E+GIM)_{i,t,t-1}$	762	0.011	0.009	-0.013	0.030	0.118
$GIM_{i,t}$	762	0.008	0	0	$1.60*10^{-5}$	0.053
$\Delta GIM_{i,t,t-1}$	762	-0.007	0	0	0	0.185
$GAM_{i,t,}$	762	0.019	0.011	0.004	0.024	0.036
$\Delta GAM_{i,t,t-1}$	762	$5.58*10^{-4}$	$1.36*10^{-4}$	$-2.67*10^{-4}$	0.002	0.015
$GIMC_{i,t}$	762	0.006	0	0	0	0.045
$\Delta GIMC_{i,t,t-1}$	762	-0.007	0	0	0	0.155
$GAMC_{i,t}$	762	0.018	0.011	0.003	0.024	0.031
$\Delta GAMC_{i,t,t-1}$	762	$5.22*10^{-5}$	$7.82*10^{-5}$	$-4.30*10^{-4}$	0.002	0.017

$P_{i,t}$ is stock price of firm i, time t; $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $GIM_{i,t}$ is reported goodwill-impairment losses of firm i, period t; $(EQ-GW)_{i,t-1}$is book equity reduced by book goodwill of firm i, time t-1; $GW_{i,t-1}$is book goodwill of firm i, time t-1; $GAM_{i,t}$ is as-if accounted goodwill-amortisation charges of firm i, period t (amortisation-only method); $(EQCA-GWCA)_{i,t-1}$ is as-if accounted book equity reduced by as-if accounted book goodwill of firm i, time t-1 (amortisation-only method); $GWCA_{i,t-1}$ is as-if accounted book goodwill of firm i, time t-1 (amortisation-only method); $GAMC_{i,t}$ is as-if accounted goodwill-amortisation charges of firm i, period t (amortisation-and-impairment method); $GIMC_{i,t}$ is as-if accounted goodwill-impairment losses of firm i, period t (amortisation-and-impairment method); $(EQCAI-GWCAI)_{i,t-1}$ is as-if accounted book equity reduced by as-if accounted book goodwill of firm i, time t-1(amortisation-and-impairment method); $GWCAI_{i,t-1}$ is as-if accounted book goodwill of firm i, time t-1(amortisation-and-impairment method); $R_{i,t}$ is stock return of firm i, period t; $\Delta(E+GIM)_{i,t,t-1}$ is changes in pre-impairment net earnings of firm i from period t-1 to t; $\Delta GIM_{i,t,t-1}$ is changes in reported goodwill-impairment losses of firm i from period t-1 to t; $\Delta GAM_{i,t,t-1}$ is as-if accounted goodwill-amortisation charges of firm i from period t-1 to t (amortisation-only method); $\Delta GIMC_{i,t,t-1}$ is changes in as-if accounted goodwill-impairment losses of firm i, period t-1 to t (amortisation-and-impairment method); $\Delta GAMC_{i,t,t-1}$ is changes in as-if accounted goodwill-amortisation charges of firm i from period t-1 to t (amortisation-and-impairment method). Goodwill-impairment losses and goodwill-amortisation charges take positive values. All independent variables in price-book-earnings regressions are deflated by number of outstanding common stocks at time t. All variables in return-earnings regressions are deflated by market value at time t-1. The descriptive statistics are calculated on on non-missing sample of observations (with outliers).

Table A2 – Correlation between variables in value-relevance regressions – non-missing sample

Panel A – Spearman(Top) and Pearson (Bottom) correlations for variables in price-book-earnings regressions

	$P_{i,t}$	$(E+GIM)_{i,t}$	$GIM_{i,t}$	$(EQ\text{-}GW)_{i,t-1}$	$GW_{i,t-1}$	$GAM_{i,t}$	$(EQCA\text{-}GWCA)_{i,t-1}$	$GWCA_{i,t-1}$	$GIMC_{i,t}$	$GAMC_{i,t}$	$(EQCAI\text{-}GWCAI)_{i,t-1}$	$GWCAI_{i,t-1}$
$-1P_{i,t}$	1.000	0.741***	0.021	0.396***	0.203***	0.225***	0.396***	0.227***	-0.002	0.221***	0.396***	0.225***
$(E+GIM)_{i,t}$	0.584***	1.000	0.053***	0.345***	0.192	0.198***	0.345***	0.219***	0.020***	0.191	0.345***	0.208***
$GIM_{i,t}$	0.021	0.083**	1.000	-0.008***	0.190***	0.175***	-0.008	0.194**	0.624	0.173	-0.008***	0.192***
$(EQ\text{-}GW)_{i,t-1}$	0.445***	0.487***	0.139***	1.000	-0.300***	-0.285***	1.000***	-0.274***	0.072**	-0.295***	1.000***	-0.287***
$GW_{i,t-1}$	0.312***	0.099***	0.289***	-0.111***	1.000	0.901***	-0.300***	0.967***	0.070*	0.914***	-0.300***	0.988***
$GAM_{i,t}$	0.342***	0.121	0.264***	-0.097***	0.886***	1.000	-0.285***	0.886***	0.032***	0.987***	-0.285***	0.870***
$(EQCA\text{-}GWCA)_{i,t-1}$	0.445***	0.487***	0.139***	1.000***	-0.111**	-0.097	1.000	-0.274***	0.072**	-0.295***	1.000***	-0.287***
$GWCA_{i,t-1}$	0.331***	0.107***	0.293***	-0.091**	0.986***	0.862***	-0.091	1.000	0.073**	0.868***	-0.274***	0.975***
$GIMC_{i,t}$	0.017***	0.068*	0.987***	0.139***	0.237***	0.213***	0.139***	0.244***	1.000	0.033	0.072**	0.074**
$GAMC_{i,t}$	0.336***	0.118***	0.263***	-0.103***	0.884***	0.996***	-0.103***	0.848***	0.213***	1.000	-0.295***	0.888***
$(EQCAI\text{-}GWCAI)_{i,t-1}$	0.445*	0.487***	0.139**	1.000***	-0.111***	-0.097***	1.000***	-0.091**	0.139***	-0.103***	1.000	-0.287***
$GWCAI_{i,t-1}$	0.326***	0.103***	0.295***	-0.102***	0.995***	0.864***	-0.102***	0.992***	0.246***	0.862***	-0.102***	1.000

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Panel B – Spearman(Top) and Pearson (Bottom) correlations for variables in price-book-earnings regressions

	$R_{i,t}$	$(E+GIM)_{i,t}$	$\Delta(E+GIM)_{i,t,t-1}$	$GIM_{i,t}$	$\Delta GIM_{i,t,t-1}$	$GAM_{i,t}$	$\Delta GAM_{i,t,t-1}$	$GIMC_{i,t}$	$GAMC_{i,t}$	$\Delta GIMC_{i,t,t-1}$	$\Delta GAMC_{i,t,t-1}$
$R_{i,t}$	1.000	0.291***	0.272***	-0.111***	-0.198***	0.021	-0.237***	-0.121***	0.020	-0.186***	-0.233***
$(E+GIM)_{i,t}$	0.305***	1.000	0.505***	-0.024	-0.013	-0.091**	-0.136***	-0.021	-0.100***	-0.006	-0.113***
$\Delta(E+GIM)_{i,t,t-1}$	0.166***	0.580***	1.000	-0.074***	-0.034	-0.029	-0.131***	-0.082**	-0.030	-0.022	-0.111***
$GIM_{i,t}$	-0.136***	-0.036	-0.060*	1.000	0.488***	0.136***	-0.046	0.622***	0.134***	0.336***	-0.073**
$\Delta GIM_{i,t,t-1}$	-0.207***	-0.043	0.019	0.281***	1.000	-0.031	0.063*	0.461***	-0.0001	0.671***	0.100*
$GAM_{i,t}$	0.196***	0.009	-0.047	0.187***	-0.683***	1.000	0.190***	0.010	0.987***	-0.019	0.157***
$\Delta GAM_{i,t,t-1}$	-0.004	-0.067*	-0.128***	0.012***	0.073**	0.014	1.000	-0.075**	0.203***	0.043	0.951***
$GIMC_{i,t}$	-0.132***	-0.041	-0.059	0.990***	0.281***	0.160***	0.013	1.000	0.010	0.587	-0.088***
$GAMC_{i,t}$	0.189***	-0.001	-0.047	0.217***	-0.572***	0.987***	0.030	0.188***	1.000	0.020	0.183***
$\Delta GIMC_{i,t,t-1}$	-0.196***	-0.044	0.011	0.274***	0.995***	-0.673***	0.071**	0.280***	-0.560***	1.000	0.096***
$\Delta GAMC_{i,t,t-1}$	-0.068*	-0.059	-0.087**	0.006	0.477***	-0.310***	0.877***	0.008	-0.248	0.475***	1.000

$P_{i,t}$ is stock price of firm i, time t; $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $GIM_{i,t}$ is reported goodwill-impairment losses of firm i, period t; $(EQ-GW)_{i,t-1}$ is book equity reduced by book goodwill of firm i, time t-1; $GW_{i,t-1}$ is book goodwill of firm i, time t-1; $GAM_{i,t}$ is as-if accounted goodwill-amortisation charges of firm i, period t (amortisation-only method); $(EQCA-GWCA)_{i,t-1}$ is as-if accounted book equity reduced by as-if accounted book goodwill of firm i, time t-1 (amortisation-only method); $GWCA_{i,t-1}$ is as-if accounted book goodwill of firm i, time t-1 (amortisation-only method); $GAMC_{i,t}$ is as-if accounted goodwill-amortisation charges of firm i, period t (amortisation-and-impairment method); $GIMC_{i,t}$ is as-if accounted goodwill-impairment losses of firm i, period t (amortisation-and-impairment method); $(EQCAI-GWCAI)_{i,t-1}$ is as-if accounted book equity reduced by as-if accounted book goodwill of firm i, time t-1(amortisation-and-impairment method); $GWCAI_{i,t-1}$ is as-if accounted book goodwill of firm i, time t-1(amortisation-and-impairment method); $R_{i,t}$ is stock return of firm i, period t; $\Delta(E+GIM)_{i,t,t-1}$ is changes in pre-impairment net earnings of firm i from period t-1 to t; $\Delta GIM_{i,t,t-1}$ is changes in reported goodwill-impairment losses of firm i from period t-1 to t; $\Delta GAM_{i,t,t-1}$ is as-if accounted goodwill-amortisation charges of firm i from period t-1 to t (amortisation-only method); $\Delta GIMC_{i,t,t-1}$ is changes in as-if accounted goodwill-impairment losses of firm i, period t-1 to t (amortisation-and-impairment method); $\Delta GAMC_{i,t,t-1}$ is changes in as-if accounted goodwill-amortisation charges of firm i from period t-1 to t (amortisation-and-impairment method). Goodwill-impairment losses and goodwill-amortisation charges take positive values. All independent variables in price-book-earnings regressions are deflated by number of outstanding common stocks at time t. All variables in return-earnings regressions are deflated by market value at time t-1. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). The correlation coefficients are estimated on non-missing sample of observations (with outliers).

Table A3 – Including year dummies – hypotheses 1a and 1b

		Stock price t							
		Main model				***Main model, year-dummies and control variables***			
		Available sample		*Non-missing*		*Available sample*		*Non-missing*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*
Intercept		2.924***	2.396***	2.865***	2.249***	-13.688**	-8.862**	-14.864**	-9.593**
		(8.35)	(10.49)	(6.92)	(9.27)	(-2.26)	(-2.38)	(-2.19)	(-2.45)
$(E+GIM)_{i,t}$	+	2.497***	3.681***	3.119***	4.325***	1.962***	3.352***	2.478***	4.130***
		(4.56)	(9.29)	(3.59)	(7.86)	(3.83)	(7.79)	(2.80)	(7.30)
$GIM_{i,t}$	-	-3.869***	-3.602**	-3.841**	-3.261**	-3.246**	-1.991**	-3.190*	-1.828**
		(-2.90)	(-2.59)	(-2.24)	(-2.39)	(-2.45)	(-2.09)	(-1.96)	(-1.98)
$(EQ-GW)_{i,t-1}$	+	0.775***	0.740***	0.725***	0.629***	0.706***	0.655***	0.649***	0.562***
		(5.55)	(13.08)	(2.75)	(5.76)	(4.83)	(10.69)	(2.60)	(4.94)
$GW_{i,t-1}$	+	1.687***	1.202***	1.592***	1.096***	1.435***	1.075***	1.350***	0.892***
		(5.32)	(6.91)	(4.32)	(6.12)	(4.73)	(6.46)	(3.84)	(5.24)
YEAR_2006		0.325*	0.292	0.207	0.367**	0.246	0.146	0.061	0.291
		(1.71)	(1.62)	(1.05)	(2.01)	(1.32)	(0.82)	(0.29)	(1.63)
YEAR_2007		-0.111	-0.173	-0.332	-0.231	-0.073	-0.019	-0.282	-0.152
		(-0.36)	(-0.80)	(-1.08)	(-1.02)	(-0.26)	(-0.09)	(-0.98)	(-0.66)
YEAR_2008		-2.012***	-1.444***	-2.268***	-1.385***	-1.673***	-1.208***	-1.832***	-1.135***
		(-4.35)	(-5.94)	(-4.27)	(-5.61)	(-3.94)	(-5.18)	(-3.77)	(-4.78)
YEAR_2009		-0.598	-0.345	-0.697	-0.288	-0.473	-0.195	-0.556	-0.102
		(-1.49)	(-1.42)	(-1.46)	(-1.20)	(-1.26)	(-0.79)	(-1.24)	(-0.38)
$GROWTH\_SALES_{i,t}$						0.644**	1.025**	0.561**	1.080**
						(2.57)	(2.43)	(2.38)	(2.50)
$lnSIZE\_MV_{i,t}$						0.912***	0.611***	0.977***	0.652***
						(3.16)	(3.40)	(3.05)	(3.44)
$RESOURCES_{i,t}$						-1.724	-1.481	-2.264	-2.119*
						(-0.75)	(-1.35)	(-0.80)	(-1.67)
$GENERAL\_INDUSTRIALS_{i,t}$						-2.082*	-1.312*	-2.425*	-1.720**
						(-1.76)	(-1.71)	(-1.91)	(-2.12)
$CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-3.596***	-2.908***	-3.719***	-2.700***
						(-2.64)	(-3.36)	(-2.68)	(-2.60)
$NON\text{-}CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-0.657	-0.394	-0.812	-0.563
						(-0.42)	(-0.43)	(-0.47)	(-0.56)
$CYCLICAL\_SERVICES_{i,t}$						-3.137**	-2.063***	-3.288**	-2.245***
						(-2.53)	(-2.67)	(-2.45)	(-2.75)
$NON\_CYCLICAL\_SERVICES_{i,t}$						-5.414***	-3.345***	-6.962***	-4.560***
						(-3.45)	(-3.44)	(-4.34)	(-4.33)
$UTILITIES_{i,t}$						-3.641**	-2.298**	-3.915**	-2.615**
						(-2.47)	(-2.17)	(-2.44)	(-2.27)
$INFORMATION\_TECHNOLOGY_{i,t}$						-3.466***	-2.415***	-3.873***	-2.898***
						(-2.69)	(-2.71)	(-2.87)	(-3.22)
$FINANCE_{i,t}$						-2.787**	-1.598*	-2.599*	-1.745*
						(-2.19)	(-1.89)	(-1.94)	(-1.93)
N		909	851	762	718	909	855	762	722
F-value		19.27***	71.74***	15.60***	40.30***	14.46***	44.23***	14.13***	27.17***
Adjusted R^2		0.503	0.591	0.496	0.587	0.557	0.639	0.546	0.650
Max VIF		1.57	1.55	1.57	1.55	5.35	5.35	5.31	5.52
Mean VIF		1.37	1.35	1.42	1.42	2.13	2.10	2.13	2.15

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Stock price of firm i, time t, is dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $GIM_{i,t}$ is reported goodwill-impairment losses of firm i, period t; $(EQ\text{-}GW)_{i,t-1}$ is book equity reduced by book goodwill of firm i, time t-1; $GW_{i,t-1}$ is book goodwill of firm i, time t-1; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, from period t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of the equity-market value of firm i, time t. YEAR_2006, YEAR_2007, YEAR_2008, YEAR_2009 are dummy variables equal 1 if the year is 2006, 2007, 2008 and 2009 respectively and otherwise 0. YEAR_2005 is the benchmark year. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector. Goodwill-impairment losses take positive values. Regression coefficients are unstandardised. t-statistics are given in parentheses. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). Observations with Cook's distance larger than 4/n where n is total number of observations are considered as outliers.

Table A4 – Excluding 2008 observations – hypotheses 1a and 1b

		Stock price t							
		Main model				***Main model with control variables***			
		Available sample		*Non-missing*		*Available sample*		*Non-missing*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*
Intercept		2.327*** (5.33)	1.960*** (7.87)	2.026*** (4.01)	1.751*** (7.10)	-9.154 (-1.51)	-6.754* (-1.84)	-11.548* (-1.66)	-8.146** (-2.05)
$(E+GIM)_{i,t}$	+	2.999*** (3.82)	4.539*** (9.15)	3.266*** (2.94)	5.257*** (8.57)	2.443*** (3.29)	3.899*** (8.12)	2.701** (2.43)	4.671*** (7.40)
$GIM_{i,t}$	-	-2.664* (-1.70)	-2.122 (-1.24)	-2.663 (-1.38)	-1.482 (-0.86)	-2.364 (-1.56)	-2.791* (-1.80)	-2.283 (-1.23)	-2.035 (-1.34)
$(EQ\text{-}GW)_{i,t-1}$	+	0.801*** (4.18)	0.716*** (8.96)	0.954*** (2.68)	0.735*** (6.42)	0.767*** (4.01)	0.655*** (10.50)	0.871** (2.57)	0.575*** (4.63)
$GW_{i,t-1}$	+	1.927*** (4.67)	1.366*** (6.00)	1.909*** (4.20)	1.198*** (6.15)	1.694*** (4.22)	1.121*** (6.44)	1.673*** (3.79)	0.933*** (5.66)
$GROWTH\_SALES_{i,t}$						0.562** (2.56)	0.448 (1.57)	0.512** (2.34)	0.534 (1.62)
$lnSIZE\_MV_{i,t}$						0.669** (2.34)	0.502*** (2.82)	0.778** (2.42)	0.579*** (2.98)
$RESOURCES_{i,t}$						-0.892 (-0.41)	-1.205 (-1.06)	-1.761 (-0.66)	-1.893 (-1.48)
$GENERAL\_INDUSTRIALS_{i,t}$						-2.249** (-2.01)	-1.355* (-1.74)	-2.552** (-2.16)	-1.842** (-2.25)
$CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-3.186** (-2.48)	-2.690*** (-3.16)	-3.177** (-2.53)	-2.568** (-2.53)
$NON\text{-}CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-0.230 (-0.15)	-0.049 (-0.05)	-0.391 (-0.24)	-0.597 (-0.58)
$CYCLICAL\_SERVICES_{i,t}$						-3.038** (-2.54)	-2.059** (-2.61)	-3.162** (-2.52)	-2.316*** (-2.74)
$NON\_CYCLICAL\_SERVICES_{i,t}$						-4.606*** (-3.26)	-2.596** (-2.45)	-6.032*** (-4.34)	-3.952*** (-3.75)
$UTILITIES_{i,t}$						-3.406** (-2.53)	-2.478** (-2.55)	-3.786*** (-2.66)	-2.880*** (-2.62)
$INFORMATION\_TECHNOLOGY_{i,t}$						-3.314*** (-2.68)	-2.486*** (-2.86)	-3.653*** (-2.89)	-2.941*** (-3.28)
$FINANCE_{i,t}$						-3.292** (-2.60)	-2.018** (-2.41)	-2.762** (-2.22)	-2.151** (-2.38)
N		734	685	615	574	734	688	615	581
F-value		19.82***	63.78***	18.43***	66.54***	9.62***	39.00***	10.42***	28.94***
Adjusted R^2		0.548	0.615	0.555	0.617	0.594	0.679	0.595	0.680
Max VIF		1.43	1.27	1.43	1.49	4.89	4.92	4.94	5.19
Mean VIF		1.25	1.16	1.25	1.28	2.13	2.10	2.12	2.18

Table continues on next page.

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Stock price of firm i, time t, is dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $GIM_{i,t}$ is reported goodwill-impairment losses of firm i, period t; $(EQ-GW)_{i,t-1}$ is book equity reduced by book goodwill of firm i, time t-1; $GW_{i,t-1}$ is book goodwill of firm i, time t-1; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, from period t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of the equity-market value of firm i, time t. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector. Goodwill-impairment losses take positive values. Regression coefficients are unstandardised. t-statistics are given in parentheses. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). Observations with Cook's distance larger than 4/n where n is total number of observations are considered as outliers.

Table A5 – Excluding large book goodwill – hypotheses 1a and 1b

		Stock price t							
		Main model				***Main model with control variables***			
		Available sample		*Non-missing*		*Available sample*		*Non-missing*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*
Intercept		2.719*** (7.85)	2.304*** (8.74)	2.422*** (6.38)	1.999*** (7.06)	-19.281*** (-2.72)	-10.363** (-2.59)	-21.273*** (-2.78)	-11.175*** (-2.60)
$(E+GIM)_{i,t}$	+	2.850*** (5.30)	4.281*** (8.82)	4.112*** (6.50)	4.918*** (9.00)	2.267*** (4.68)	3.270*** (6.80)	3.322*** (5.01)	4.387*** (6.37)
$GIM_{i,t}$	-	-5.044*** (-2.89)	-2.668** (-2.27)	-4.884* (-1.92)	-2.304** (-2.14)	-4.560*** (-2.69)	-2.407* (-1.80)	-4.306* (-1.81)	-2.115* (-1.69)
$(EQ\text{-}GW)_{i,t-1}$	+	0 .650*** (4.69)	0.628*** (8.77)	0.449* (1.83)	0.584*** (5.49)	0.588*** (3.97)	0.588*** (7.38)	0.402* (1.67)	0.504*** (4.04)
$GW_{i,t-1}$	+	2.068*** (5.98)	1.079*** (2.91)	1.910*** (5.08)	1.087*** (2.91)	1.930*** (6.08)	1.179*** (3.29)	1.773*** (5.01)	0.966*** (2.84)
$GROWTH\_SALES_{i,t}$						0.666** (2.53)	1.181** (2.27)	0.497** (2.55)	1.126** (2.26)
$lnSIZE\_MV_{i,t}$						1.157*** (3.40)	0.680*** (3.51)	1.254*** (3.41)	0.711*** (3.37)
$RESOURCES_{i,t}$						-2.257 (-1.01)	-1.658 (-1.44)	-2.918 (-1.07)	-2.130 (-1.61)
$GENERAL\_INDUSTRIALS_{i,t}$						-1.898 (-1.62)	-1.407* (-1.86)	-2.262* (-1.79)	-1.713** (-2.06)
$CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-3.094** (-2.44)	-2.793*** (-3.19)	-3.186** (-2.53)	-2.275** (-2.17)
$NON\text{-}CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-1.589 (-1.02)	-0.755 (-0.77)	-1.996 (-1.20)	-1.073 (-1.04)
$CYCLICAL\_SERVICES_{i,t}$						-2.542** (-2.06)	-1.647* (-1.98)	-2.725** (-2.08)	-1.663* (-1.88)
$NON\_CYCLICAL\_SERVICES_{i,t}$						-4.752*** (-3.12)	-2.899*** (-2.66)	-6.220*** (-3.89)	-3.884*** (-3.54)
$UTILITIES_{i,t}$						-3.610** (-2.47)	-2.154** (-2.02)	-3.794** (-2.34)	-2.176* (-1.85)
$INFORMATION\_TECHNOLOGY_{i,t}$						-2.909** (-2.22)	-2.619*** (-2.94)	-3.758*** (-3.26)	-2.954*** (-3.59)
$FINANCE_{i,t}$						-2.381** (-1.98)	-1.659** (-1.98)	-2.331* (-1.80)	-1.513* (-1.66)
N		682	637	559	522	682	642	559	527
F-value		29.43***	71.59***	25.81***	50.61***	11.37***	24.50***	17.72***	24.54***
Adjusted R^2		0 .524	0 .570	0.545	0.613	0.571	0.632	0.588	0.659
Max VIF		1.29	1.24	1.48	1.37	4.12	4.17	4.16	4.26
Mean VIF		1.24	1.18	1.38	1.24	2.03	1.98	2.03	1.97

Stock price of firm i, time t, is dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $GIM_{i,t}$ is reported goodwill-impairment losses of firm i, period t; $(EQ\text{-}GW)_{i,t-1}$is book equity reduced by book goodwill of firm i, time t-1;$GW_{i,t-1}$is book goodwill of firm i, time t-1; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, from period t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of the equity-market value of firm i, time t. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector. Goodwill-impairment losses take positive values. Regression coefficients are unstandardised. t-statistics are given in parentheses. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). Observations with Cook's distance larger than 4/n where n is total number of observations are considered as outliers.

Table A6 – Excluding large goodwill-impairment losses – hypotheses 1a and 1b

		Stock price t							
		Main model				*Main model with control variables*			
		Available sample		*Non-missing*		*Available sample*		*Non-missing*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*
Intercept		2.518***	2.038***	2.244***	1.825***	-15.340***	-12.023***	-15.636**	-11.562***
		(6.49)	(9.03)	(4.91)	(7.69)	(-2.54)	(-3.38)	(-2.33)	(-3.01)
$(E+GIM)_{i,t}$	+	2.840***	4.424***	3.923***	5.222***	2.261***	3.565***	3.163**	4.747***
		(3.99)	(9.04)	(2.91)	(9.51)	(3.49)	(7.75)	(2.40)	(8.53)
$GIM_{i,t}$	-	-6.544	-4.457	-9.104	-8.638	-2.926	-1.639	-4.987	0.781
		(-0.58)	(-0.73)	(-0.87)	(-1.12)	(-0.26)	(-0.31)	(-0.47)	(0.12)
$(EQ-GW)_{i,t-1}$	+	0.728***	0.645***	0.592*	0.580***	0.656***	0.633***	0.523*	0.545***
		(4.47)	(8.46)	(1.87)	(5.30)	(3.86)	(8.88)	(1.80)	(4.78)
$GW_{i,t-1}$	+	1.629***	1.128***	1.505***	1.036***	1.363***	1.067***	1.270***	0.889***
		(4.20)	(6.21)	(3.13)	(5.62)	(3.69)	(6.13)	(2.84)	(5.11)
$GROWTH\_SALES_{i,t}$						0.727**	0.992**	0.712**	1.117***
						(2.66)	(2.43)	(2.51)	(2.68)
$lnSIZE\_MV_{i,t}$						0.982***	0.754***	0.994***	0.722***
						(3.45)	(4.42)	(3.19)	(3.88)
$RESOURCES_{i,t}$						-1.983	-1.851*	-2.224	-2.234*
						(-0.89)	(-1.69)	(-0.80)	(-1.77)
$GENERAL\_INDUSTRIALS_{i,t}$						-2.377**	-1.305*	-2.756**	-1.466*
						(-2.05)	(-1.84)	(-2.23)	(-1.94)
$CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-3.363***	-2.690***	-3.395***	-2.668***
						(-2.71)	(-3.35)	(-2.70)	(-3.25)
$NON\text{-}CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-0.877	-0.575	-0.939	-0.553
						(-0.57)	(-0.65)	(-0.57)	(-0.58)
$CYCLICAL\_SERVICES_{i,t}$						-3.309***	-2.224***	-3.406***	-2.170***
						(-2.82)	(-3.00)	(-2.74)	(-2.76)
$NON\_CYCLICAL\_SERVICES_{i,t}$						-4.678***	-3.428***	-5.901***	-3.853***
						(-3.25)	(-3.48)	(-4.46)	(-3.86)
$UTILITIES_{i,t}$						-3.761***	-2.351**	-3.867***	-2.492**
						(-2.71)	(-2.36)	(-2.62)	(-2.27)
$INFORMATION\_TECHNOLOGY_{i,t}$						-3.658***	-2.654***	-4.067***	-2.708***
						(-2.76)	(-3.10)	(-3.02)	(-3.09)
$FINANCE_{i,t}$						-2.939**	-1.723**	-2.755**	-1.674*
						(-2.42)	(-2.16)	(-2.19)	(-1.96)
N		864	800	719	673	864	812	719	681
F-value		25.81***	67.59***	20.35***	52.93***	12.32***	36.91***	10.06***	29.70***
Adjusted R^2		0.497	0.560	0.502	0.600	0.553	0.648	0.551	0.671
Max VIF		1.29	1.35	1.54	1.50	5.02	5.05	4.99	5.05
Mean VIF		1.20	1.20	1.33	1.29	2.18	2.14	2.17	2.15

Stock price of firm i, time t, is dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $GIM_{i,t}$ is reported goodwill-impairment losses of firm i, period t; $(EQ-GW)_{i,t-1}$ is book equity reduced by book goodwill of firm i, time t-1; $GW_{i,t-1}$ is book goodwill of firm i, time t-1; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, from period t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of the equity-market value of firm i, time t. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector. Goodwill-impairment losses take positive values. Regression coefficients are unstandardised. t-statistics are given in parentheses. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). Observations with Cook's distance larger than 4/n where n is total number of observations are considered as outliers.

Table A7 – Stock prices measured with time lag t+2 months – hypotheses 1a and 1b

		Stock price t+2 months							
		Main model				*Main model with control variables*			
		Available sample		*Non-missing*		*Available sample*		*Non-missing*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*
Intercept		2.667*** (7.38)	2.164*** (9.20)	2.535*** (6.46)	1.890*** (8.16)	-14.537*** (-2.40)	-9.679*** (-2.61)	-16.332*** (-2.42)	-10.704*** (-2.76)
$(E+GIM)_{i,t}$	+	2.696*** (4.79)	3.951*** (8.65)	3.339*** (4.10)	4.900*** (9.56)	2.072*** (4.12)	3.540*** (7.85)	2.591*** (3.25)	4.063*** (7.55)
$GIM_{i,t}$	-	-3.628*** (-2.87)	-3.093** (-2.08)	-3.453** (-2.07)	-2.325 (-1.62)	-2.894** (-2.27)	-1.797* (-1.73)	-2.655* (-1.68)	-1.344 (-1.37)
$(EQ-GW)_{i,t-1}$	+	0.757*** (4.86)	0.764*** (11.61)	0.647** (2.48)	0.727*** (11.61)	0.676*** (4.15)	0.652*** (8.60)	0.563** (2.25)	0.528*** (4.44)
$GW_{i,t-1}$	+	1.524*** (5.28)	1.130*** (6.63)	1.389*** (4.14)	0.969*** (5.71)	1.283*** (4.76)	1.009*** (6.21)	1.164*** (3.69)	0.841*** (5.23)
$GROWTH\_SALES_{i,t}$						0.706*** (3.10)	1.063** (2.56)	0.723*** (3.12)	1.248*** (2.78)
$lnSIZE\_MV_{i,t}$						0.970*** (3.35)	0.661*** (3.70)	1.060*** (3.31)	0.661*** (3.70)
$RESOURCES_{i,t}$						-1.793 (-0.76)	-1.507 (-1.30)	-2.460 (-0.89)	-1.408 (-1.12)
$GENERAL\_INDUSTRIALS_{i,t}$						-2.790** (-2.20)	-1.740** (-2.41)	-3.171** (-2.26)	-2.061** (-2.51)
$CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-3.415** (-2.23)	-3.310*** (-3.90)	-3.523** (-2.23)	-2.784*** (-2.69)
$NON\text{-}CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-1.253 (-0.80)	-0.824 (-0.95)	-1.429 (-0.81)	-1.076 (-1.12)
$CYCLICAL\_SERVICES_{i,t}$						-3.683*** (-2.83)	-2.518*** (-3.42)	-3.754** (-2.60)	-2.485*** (-3.01)
$NON\_CYCLICAL\_SERVICES_{i,t}$						-5.791*** (-3.39)	-4.391*** (-4.97)	-7.441*** (-4.37)	-4.457*** (-4.31)
$UTILITIES_{i,t}$						-4.213*** (-2.70)	-2.714** (-2.60)	-4.480** (-2.53)	-2.776** (-2.29)
$INFORMATION\_TECHNOLOGY_{i,t}$						-4.084*** (-2.89)	-2.823*** (-3.12)	-4.415*** (-2.84)	-2.823*** (-3.12)
$FINANCE_{i,t}$						-3.349** (-2.52)	-2.080** (-2.59)	-3.097** (-2.15)	-1.932** (-2.14)
N		909	845	762	711	909	853	762	718
F-value		20.10***	64.33***	18.79***	61.58***	9.62***	36.85***	10.11***	26.66***
Adjusted R^2		0 .479	0 .532	0.467	0.552	0.541	0.624	0.526	0.614
Max VIF		1.22	1.18	1.40	1.31	5.27	5.32	5.26	5.34
Mean VIF		1.16	1.12	1.26	1.20	2.23	2.19	2.22	2.18

Stock price of firm i, time t+2 months, is dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $GIM_{i,t}$ is reported goodwill-impairment losses of firm i, period t; $(EQ-GW)_{i,t-1}$is book equity reduced by book goodwill of firm i, time t-1;$GW_{i,t-1}$is book goodwill of firm i, time t-1; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, from period t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of the equity-market value of firm i, time t. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector. Goodwill-impairment losses take positive values. Regression coefficients are unstandardised. t-statistics are given in parentheses. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). Observations with Cook's distance larger than 4/n where n is total number of observations are considered as outliers.

Table A8 – Stock prices measured with time lag t+3 months – hypotheses 1a and 1b

		Stock price t+3 months							
		Main model				*Main model with control variables*			
		Available sample		*Non-missing*		*Available sample*		*Non-missing*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*
Intercept		2.761***	2.167***	2.527***	1.883***	-14.908***	-9.889***	-16.679**	-10.790***
		(8.00)	(9.26)	(6.66)	(8.43)	(-2.50)	(-2.80)	(-2.51)	(-2.85)
$(E+GIM)_{i,t}$	+	2.703***	4.268***	3.478***	5.033***	2.097***	3.511***	2.728***	4.219***
		(4.80)	(9.71)	(4.27)	(10.20)	(4.14)	(8.69)	(3.46)	(8.11)
$GIM_{i,t}$	-	-3.366***	-2.987	-3.293**	-2.053	-2.617***	-1.746*	-2.511*	-1.422
		(-3.45)	(-1.43)	(-2.31)	(-1.02)	(-2.68)	(-1.69)	(-1.88)	(-1.46)
$(EQ-GW)_{i,t-1}$	+	0.680***	0.729***	0.583**	0.667***	0.601***	0.606***	0.499**	0.465***
		(5.01)	(10.69)	(2.38)	(6.90)	(4.14)	(8.56)	(2.12)	(3.83)
$GW_{i,t-1}$	+	1.534***	1.120***	1.422***	1.028***	1.293***	0.961***	1.202***	0.848***
		(5.42)	(6.48)	(4.31)	(6.02)	(4.89)	(5.64)	(3.89)	(4.97)
$GROWTH\_SALES_{i,t}$						0.759***	0.974**	0.673***	1.076**
						(3.07)	(2.53)	(3.06)	(2.36)
$lnSIZE\_MV_{i,t}$						0.997***	0.671***	1.075***	0.715***
						(3.51)	(3.91)	(3.42)	(3.86)
$RESOURCES_{i,t}$						-2.186	-1.228	-2.410	-1.392
						(-0.95)	(-1.22)	(-0.86)	(-1.22)
$GENERAL\_INDUSTRIALS_{i,t}$						-2.890**	-1.614**	-3.096**	-1.926**
						(-2.25)	(-2.29)	(-2.20)	(-2.53)
$CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-3.544**	-2.708***	-3.443**	-2.760***
						(-2.29)	(-3.02)	(-2.19)	(-2.98)
$NON\text{-}CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-1.561	-0.819	-1.614	-1.107
						(-1.00)	(-0.98)	(-0.94)	(-1.24)
$CYCLICAL\_SERVICES_{i,t}$						-3.792***	-2.356***	-3.748***	-2.451***
						(-2.89)	(-3.36)	(-2.63)	(-3.24)
$NON\_CYCLICAL\_SERVICES_{i,t}$						-5.965***	-4.271***	-7.385***	-4.296***
						(-3.49)	(-4.94)	(-4.38)	(-4.35)
$UTILITIES_{i,t}$						-4.529***	-2.776***	-4.626***	-3.063***
						(-2.88)	(-2.73)	(-2.64)	(-2.77)
$INFORMATION\_TECHNOLOGY_{i,t}$						-4.075***	-2.828***	-4.285***	-2.985***
						(-2.78)	(-3.29)	(-2.73)	(-3.18)
$FINANCE_{i,t}$						-3.314**	-1.862**	-2.949**	-1.761**
						(-2.47)	(-2.43)	(-2.06)	(-2.09)
N		909	846	762	707	909	848	762	718
F-value		24.08***	69.12***	20.49***	78.37***	10.36***	38.67***	9.87***	27.91***
Adjusted R^2		0.465	0.542	0.473	0.557	0.527	0.595	0.530	0.618
Max VIF		1.22	1.16	1.40	1.35	5.27	5.41	5.26	5.36
Mean VIF		1.16	1.11	1.26	1.22	2.23	2.19	2.22	2.19

Stock price of firm i, time t+3 months, is dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $GIM_{i,t}$ is reported goodwill-impairment losses of firm i, period t; $(EQ-GW)_{i,t-1}$is book equity reduced by book goodwill of firm i, time t-1;$GW_{i,t-1}$is book goodwill of firm i, time t-1; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, from period t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of the equity-market value of firm i, time t. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\_ GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\ \_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector. Goodwill-impairment losses take positive values. Regression coefficients are unstandardised. t-statistics are given in parentheses. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). Observations with Cook's distance larger than 4/n where n is total number of observations are considered as outliers.

Table A9 – Stock prices measured with time lag t+4 months – hypotheses 1a and 1b

		Stock price t+4 months							
		Main model				*Main model with control variables*			
		Available sample		*Non-missing*		*Available sample*		*Non-missing*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*
Intercept		2.837***	2.196***	2.576***	2.017***	-14.466***	-10.178***	-16.224**	-10.915***
		(8.53)	(9.62)	(7.20)	(8.68)	(-2.37)	(-2.79)	(-2.38)	(-2.79)
$(E+GIM)_{i,t}$	+	2.759***	4.385***	3.529***	4.959***	2.115***	3.730***	2.750***	4.108***
		(4.66)	(9.77)	(4.16)	(9.97)	(4.02)	(8.43)	(3.41)	(7.98)
$GIM_{i,t}$	-	-3.097***	-2.703**	-3.045**	-2.095*	-2.371***	-1.637	-2.281*	-1.771**
		(-3.50)	(-2.26)	(-2.33)	(-1.92)	(-2.75)	(-1.55)	(-1.90)	(-2.05)
$(EQ-GW)_{i,t-1}$	+	0.706***	0 .741***	0.616**	0.631***	0.624***	0.607***	0.524**	0.557***
		(5.41)	(11.41)	(2.58)	(6.05)	(4.45)	(7.99)	(2.31)	(4.44)
$GW_{i,t-1}$	+	1.504***	1.135***	1.401***	1.044***	1.264***	0 .978***	1.181***	0.917***
		(5.59)	(6.28)	(4.41)	(5.89)	(5.15)	(5.84)	(4.08)	(5.43)
$GROWTH\_SALES_{i,t}$						0 .813***	1.079***	0.703***	1.101**
						(2.81)	(2.70)	(2.91)	(2.41)
$lnSIZE\_MV_{i,t}$						0 .981***	0 .682***	1.054***	0.715***
						(3.38)	(3.87)	(3.28)	(3.74)
$RESOURCES_{i,t}$						-1.761	-1.034	-1.960	-1.297
						(-0.76)	(-0.98)	(-0.70)	(-1.15)
$GENERAL\_INDUSTRIALS_{i,t}$						-2.881**	-1.443**	-3.047**	-1.754**
						(-2.11)	(-1.96)	(-2.05)	(-2.21)
$CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-3.647**	-2.665***	-3.467**	-2.639**
						(-2.24)	(-2.86)	(-2.09)	(-2.77)
$NON\text{-}CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-1.455	-0.761	-1.426	-0.951
						(-0.89)	(-0.88)	(-0.80)	(-1.01)
$CYCLICAL\_SERVICES_{i,t}$						-3.833***	-2.353***	-3.730**	-2.371***
						(-2.81)	(-3.20)	(-2.52)	(-3.01)
$NON\_CYCLICAL\_SERVICES_{i,t}$						-6.003***	-4.184***	-7.326***	-4.645***
						(-3.40)	(-4.61)	(-4.15)	(-4.61)
$UTILITIES_{i,t}$						-4.586***	-2.797***	-4.600**	-2.849**
						(-2.83)	(-2.71)	(-2.56)	(-2.49)
$INFORMATION\_TECHNOLOGY_{i,t}$						-4.067***	-2.924***	-4.233**	-3.060***
						(-2.63)	(-3.61)	(-2.56)	(-3.58)
$FINANCE_{i,t}$						-3.493**	-1.909**	-2.997**	-1.753**
						(-2.51)	(-2.38)	(-2.01)	(-2.02)
N		909	849	762	713	909	850	762	717
F-value		30.30***	79.13***	26.17***	64.42***	12.58***	40.24***	11.19***	32.53***
Adjusted R^2		0.465	0.556	0.477	0.578	0.529	0.619	0.534	0.633
Max VIF		1.22	1.17	1.40	1.39	5.27	5.42	5.26	5.35
Mean VIF		1.16	1.12	1.26	1.25	2.23	2.20	2.22	2.18

Stock price of firm i, time t+4 months, is dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $GIM_{i,t}$ is reported goodwill-impairment losses of firm i, period t; $(EQ-GW)_{i,t-1}$is book equity reduced by book goodwill of firm i, time t-1;$GW_{i,t-1}$is book goodwill of firm i, time t-1; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, from period t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of the equity-market value of firm i, time t. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\_ GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION \_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector. Goodwill-impairment losses take positive values. Regression coefficients are unstandardised. t-statistics are given in parentheses. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). Observations with Cook's distance larger than 4/n where n is total number of observations are considered as outliers.

Table A10 – Scaled by total assets t-1 – hypotheses 1a and 1b

		Market value scaled by total assets t-1							
		Main model				***Main model with control variables***			
		Available sample		*Non-missing*		*Available sample*		*Non-missing*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*
Intercept		0.600***	0.274***	0.476***	0.240***	0.479	0.314	-0.286	-0.628
		(2.62)	(3.83)	(3.07)	(3.33)	(0.56)	(0.46)	(-0.31)	(-0.92)
$(E+GIM)_{i,t}$	+	10.076***	8.485***	6.812***	7.703***	10.052***	8.750***	6.741***	7.829***
		(3.56)	(13.32)	(3.79)	(11.94)	(3.51)	(11.01)	(3.77)	(12.26)
$GIM_{i,t}$	-	-3.995	-4.268***	-4.478**	-4.669***	-3.924	-3.876***	-4.006*	-3.206***
		(-1.61)	(-3.90)	(-2.11)	(-4.34)	(-1.53)	(-3.13)	(-1.88)	(-3.36)
$(EQ-GW)_{i,t-1}$	+	-0.440	0.570***	-0.497	0.652***	-0.587	0.525***	0.292	0.407***
		(-0.47)	(2.96)	(1.07)	(3.09)	(-0.63)	(2.73)	(0.67)	(2.05)
$GW_{i,t-1}$	+	-0.177	0.993***	0.805*	1.324***	-0.456	0.679**	0.534	0.722***
		(-0.19)	(4.74)	(1.70)	(5.07)	(-0.49)	(2.39)	(1.26)	(2.81)
$GROWTH\_SALES_{i,t}$						0.189*	0.435***	0.175*	0.292***
						(1.82)	(3.77)	(1.87)	(2.77)
$lnSIZE\_MV_{i,t}$						0.012	$-5.73*10^{-4}$	0.049	0.049
						(0.28)	(-0.02)	(1.08)	(1.52)
$RESOURCES_{i,t}$						-0.647**	-0.380*	-0.640*	-0.601***
						(-2.03)	(-1.69)	(-1.92)	(-2.61)
$GENERAL\_INDUSTRIALS_{i,t}$						-0.064	0.095	-0.176	0.001
						(-0.34)	(0.68)	(-1.00)	(0.01)
$CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-0.438**	-0.228	-0.435**	-0.226
						(-2.12)	(-1.40)	(-2.25)	(-1.62)
$NON\text{-}CYCLICAL\_CONSUMER\_GOODS_{i,t}$						0.117	0.206	-0.027	0.078
						(0.61)	(1.38)	(-0.13)	(0.52)
$CYCLICAL\_SERVICES_{i,t}$						-0.097	-0.070	-0.278	-0.104
						(-0.56)	(-0.57)	(-1.46)	(-0.87)
$NON\_CYCLICAL\_SERVICES_{i,t}$						0.104	0.307	-0.364	-0.164
						(0.39)	(1.31)	(-1.48)	(-0.93)
$UTILITIES_{i,t}$						-0.472**	-0.254	-0.611***	-0.390***
						(-2.29)	(-1.63)	(-2.97)	(-2.67)
$INFORMATION\_TECHNOLOGY_{i,t}$						0.692*	0.333*	0.328	0.334*
						(1.65)	(1.72)	(0.88)	(1.72)
$FINANCE_{i,t}$						-0.092	-0.187	-0.175	-0.235*
						(-0.44)	(-1.38)	(-0.66)	(-1.92)
N		909	867	762	726	909	868	762	723
F-value		13.36***	65.11***	19.79***	53.62***	10.65***	19.89***	12.85***	22.93***
Adjusted R^2		0.381	0.461	0.355	0.428	0.393	0.507	0.377	0.488
Max VIF		2.81	2.50	3.41	1.61	5.36	5.35	5.37	5.67
Mean VIF		1.91	1.76	2.20	1.33	2.43	2.26	2.48	2.28

Market value of firm i, time t, scaled by total assets at time t-1, is dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $GIM_{i,t}$ is reported goodwill-impairment losses of firm i, period t; $(EQ-GW)_{i,t-1}$is book equity reduced by book goodwill of firm i, time t-1;$GW_{i,t-1}$is book goodwill of firm i, time t-1; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, from period t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of the equity-market value of firm i, time t. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\_ GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\ \_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector. Goodwill-impairment losses take positive values. Regression coefficients are unstandardised. All variables (both dependent and independent variables) except from control variables and industry-sector dummies are scaled by total asset of firm i, time t-1. t-statistics are given in parentheses. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). Observations with Cook's distance larger than 4/n where n is total number of observations are considered as outliers.

Table A11 – Scaled by total sales t – hypotheses 1a and 1b

		Market value scaled by total sales t							
		Main model				***Main model with control variables***			
		Available sample		*Non-missing*		*Available sample*		*Non-missing*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*
Intercept		0.799***	0.661***	0.512***	0.451***	-0.828	-1.147***	-1.420***	-2.002**
		(7.26)	(9.82)	(4.43)	(8.08)	(-0.59)	(-1.20)	(-1.05)	(-2.21)
$(E+GIM)_{i,t}$	+	1.757***	2.351***	3.234***	4.121***	1.689***	2.299***	3.033***	3.603***
		(7.48)	(9.36)	(7.10)	(8.58)	(8.08)	(9.05)	(7.03)	(9.52)
$GIM_{i,t}$	-	-2.812***	-2.741***	-3.091***	-2.191***	-2.687**	-2.671***	-2.572***	-2.505***
		(-2.75)	(-3.23)	(-3.02)	(-3.26)	(-2.45)	(-3.97)	(-2.79)	(-6.03)
$(EQ\text{-}GW)_{i,t-1}$	+	0.836***	0.912***	0.908***	0.931***	0.777***	0.817***	0.814***	0.948***
		(22.22)	(16.34)	(6.73)	(11.28)	(16.64)	(30.85)	(5.41)	(14.83)
$GW_{i,t-1}$	+	1.662***	1.339***	1.692***	1.215***	1.421***	1.203***	1.428***	1.239***
		(3.98)	(8.34)	(4.55)	(7.87)	(3.60)	(9.14)	(3.94)	(9.00)
$GROWTH\_SALES_{i,t}$						0.221*	0.365**	0.162*	0.479***
						(1.84)	(2.14)	(1.88)	(3.31)
$lnSIZE\_MV_{i,t}$						0.073	0.078*	0.100	0.112***
						(1.15)	(1.76)	(1.63)	(2.63)
$RESOURCES_{i,t}$						0.058	0.013	-0.263	-0.329
						(0.14)	(0.05)	(-0.59)	(-1.42)
*GENERAL_*						0.025	0.140	-0.225	0.071
$INDUSTRIALS_{i,t}$						(0.08)	(0.78)	(-0.71)	(0.53)
*CYCLICAL_ CONSUMER_*						-0.515	-0.330*	-0.514	-0.246
$GOODS_{i,t}$						(-1.61)	(-1.71)	(-1.60)	(-1.52)
*NON-CYCLICAL_*						0.308	0.457*	0.103	0.239
$CONSUMER\_GOODS_{i,t}$						(0.86)	(1.91)	(0.28)	(1.26)
$CYCLICAL\_SERVICES_{i,t}$						-0.156	$-3.04*10^{-4}$	-0.342	-0.042
						(-0.48)	(-0.00)	(-1.07)	(-0.30)
*NON_CYCLICAL_*						1.005	Omitted[37]	-0.676*	-0.336*
$SERVICES_{i,t}$						(0.83)		(-1.93)	(-1.83)
$UTILITIES_{i,t}$						-0.058	0.029	-0.425	-0.046
						(-0.14)	(0.13)	(-1.13)	(-0.23)
*INFORMATION_*						1.026	0.498*	0.948	0.523*
$TECHNOLOGY_{i,t}$						(1.41)	(1.77)	(1.20)	(1.77)
$FINANCE_{i,t}$						0.867*	0.525***	0.572	0.356*
						(1.87)	(2.46)	(1.11)	(1.88)
N		909	852	762	710	909	856	762	713
F-value		137.43***	81.55***	16.80***	77.80***	47.18***	98.29***	16.98***	35.68***
Adjusted R^2		0.659	0.572	0.587	0.531	0.678	0.724	0.620	0.622
Max VIF		1.09	1.08	1.10	1.11	5.24	5.35	5.22	5.50
Mean VIF		1.07	1.02	1.08	1.09	2.20	2.26	2.17	2.18

Table continues on next page.

[37] No observations.

Table continues from previous page.

Market value of firm i, time t, scaled by total sales in period t, is dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $GIM_{i,t}$ is reported goodwill-impairment losses of firm i, period t; $(EQ\text{-}GW)_{i,t-1}$ is book equity reduced by book goodwill of firm i, time t-1; $GW_{i,t-1}$ is book goodwill of firm i, time t-1; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, from period t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of the equity-market value of firm i, time t. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector. Goodwill-impairment losses take positive values. Regression coefficients are unstandardised. All variables (both dependent and independent variables) except from control variables and industry-sector dummies are scaled by total sales of firm i, period t. t-statistics are given in parentheses. *indicates significant at 10% level (two-tailed), **indicates significant at 5 % level (two-tailed), *** indicates significant at 1% level (two-tailed). Observations having a value of Cook's distance larger than 4/n where n is total number of observations are classified as outliers.

Table A12 – Control for size – hypotheses 1a and 1b

		Unstandardised residuals t							
		Main model				***Main model with control variables***			
		Available sample		*Non-missing*		*Available sample*		*Non-missing*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*
Intercept		-2.710***	-3.021***	-2.850***	-3.210 ***	20.526***	24.515***	19.015***	24.945***
		(-6.75)	(-11.04)	(-6.22)	(-10.79)	(3.48)	(6.83)	(2.87)	(6.24)
$(E+GIM)_{i,t}$	+	1.736***	2.939***	2.128***	3.429***	2.039***	3.470***	2.493***	4.259***
		(3.60)	(7.01)	(2.61)	(7.75)	(3.96)	(7.86)	(2.79)	(7.35)
$GIM_{i,t}$	-	-3.335**	-2.179**	-3.367**	-1.920**	-3.630***	-2.542***	-3.550**	-2.275**
		(-2.53)	(-2.46)	(-2.13)	(-2.14)	(-2.73)	(-2.67)	(-2.20)	(-2.51)
$(EQ\text{-}GW)_{i,t-1}$	+	0 .642***	0.565***	0.602**	0.598***	0.683***	0.648***	0.621**	0.553***
		(4.12)	(7.77)	(2.20)	(5.81)	(4.56)	(10.56)	(2.45)	(5.06)
$GW_{i,t-1}$	+	1.305***	0.867***	1.268***	0.789***	1.373***	1.034***	1.292***	0.882***
		(4.25)	(4.63)	(3.58)	(4.10)	(4.58)	(6.29)	(3.73)	(5.29)
$GROWTH\_SALES_{i,t}$						0.677***	0.988**	0.613**	1.154***
						(2.76)	(2.54)	(2.56)	(2.71)
$lnSIZE\_MV_{i,t}$						-0.979***	-1.234***	-0.903***	-1.256***
						(-3.47)	(-7.15)	(-2.88)	(-6.50)
$RESOURCES_{i,t}$						-2.156	-1.948*	-2.552	-2.351*
						(-0.92)	(-1.81)	(-0.87)	(-1.82)
GENERAL_ $INDUSTRIALS_{i,t}$						-2.447**	-1.659**	-2.807**	-1.916**
						(-2.04)	(-2.34)	(-2.13)	(-2.51)
CYCLICAL_ CONSUMER_ $GOODS_{i,t}$						-3.397**	-2.864***	-3.511**	-2.939***
						(-2.54)	(-3.60)	(-2.56)	(-3.47)
NON-CYCLICAL_ $CONSUMER\_GOODS_{i,t}$						-0.951	-0.649	-1.091	-0.585
						(-0.60)	(-0.74)	(-0.62)	(-0.59)
$CYCLICAL\_SERVICES_{i,t}$						-3.309***	-2.268***	-3.461**	-2.273***
						(-2.63)	(-3.08)	(-2.51)	(-2.85)
NON_CYCLICAL_ $SERVICES_{i,t}$						-5.412***	-4.282***	-6.976***	-4.191***
						(-3.38)	(-4.83)	(-4.38)	(-4.17)
$UTILITIES_{i,t}$						-4.041***	-2.699***	-4.337**	-2.861**
						(-2.69)	(-2.68)	(-2.60)	(-2.51)
INFORMATION_ $TECHNOLOGY_{i,t}$						-3.732***	-2.820***	-4.167***	-3.005***
						(-2.85)	(-3.45)	(-2.85)	(-3.44)
$FINANCE_{i,t}$						-2.941**	-1.794**	-2.762**	-1.799**
						(-2.28)	(-2.25)	(-2.00)	(-2.06)
N		909	852	762	715	909	851	762	721
F-value		11.82***	56.17***	9.49***	56.94***	9.44***	56.63***	16.38***	33.14***
Adjusted R^2		0.357	0 .392	0.347	0.391	0.430	0.558	0.415	0.568
Max VIF		1.22	1.45	1.40	1.43	5.27	5.43	5.26	5.51
Mean VIF		1.16	1.27	1.26	1.27	2.23	2.21	2.22	2.24

Dependent variable is unstandardised residuals from a regression of stock prices on size where size is measured as natural logarithm of the equity-market value at the end of the fiscal year. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $GIM_{i,t}$ is reported goodwill-impairment losses of firm i, period t; $(EQ\text{-}GW)_{i,t-1}$is book equity reduced by book goodwill of firm i, time t-1;$GW_{i,t-1}$is book goodwill of firm i, time t-1; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, from period t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of the equity-market value of firm i, time t. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, CYCLICAL_CONSUMER_ $GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, INFORMATION _$TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector. Goodwill-impairment losses take positive values. Regression coefficients are unstandardised. All variables (both dependent and independent variables) except from control variables and industry-sector dummies are scaled by total sales of firm i, period t. t-statistics are given in parentheses. *indicates significant at 10% level (two-tailed), **indicates significant at 5 % level (two-tailed), *** indicates significant at 1% level (two-tailed). Observations having a value of Cook’s distance larger than 4/n where n is total number of observations are classified as outliers.

Table A13 – Including year dummies – hypothesis 1c

		Stock return t							
		Main model				***Main model, year-dummies and control variables***			
		Available sample		*Non-missing*		*Available sample*		*Non-missing*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*
Intercept		0.222***	0.196***	0.197***	0.187***	-0.120	-0.328*	-0.508**	-0.513***
		(6.13)	(8.18)	(5.26)	(7.83)	(-0.55)	(-1.98)	(-2.09)	(-3.32)
$(E+GIM)_{i,t}$	+	1.501***	1.263***	1.629***	1.335***	1.376***	1.056***	1.342***	1.090***
		(3.35)	(7.49)	(3.93)	(9.44)	(3.08)	(6.51)	(3.39)	(5.90)
$\Delta\ (E+GIM)_{i,t,t-1}$	+	-0.721*	-0.314**	-0.393	-0.276***	-0.699*	-0.273**	-0.303	-0.206*
		(-1.77)	(-2.38)	(-1.62)	(-2.72)	(-1.65)	(-2.46)	(-1.26)	(-1.84)
$GIM_{i,t}$	-	-0.549**	-1.248***	-0.495**	-1.033***	-0.393*	-0.891**	-0.350*	-0.910**
		(-2.57)	(-2.87)	(-2.49)	(-2.65)	(-1.83)	(-2.06)	(-1.78)	(-2.25)
$\Delta GIM_{i,t,t-1}$	-	-0.303***	-0.783***	-0.314***	-0.819***	-0.332***	-0.998***	-0.343***	-0.845***
		(-4.86)	(-3.15)	(-4.59)	(-3.21)	(-5.55)	(-2.94)	(-5.00)	(-3.03)
YEAR_2006		-0.122***	-0.090***	-0.103***	-0.069**	-0.132***	-0.092***	-0.121***	-0.067***
		(-3.90)	(-3.42)	(-3.17)	(-2.57)	(-4.18)	(-3.54)	(-3.66)	(-2.53)
YEAR_2007		-0.383***	-0.335***	-0.370***	-0.351***	-0.404***	-0.365***	-0.392***	-0.353***
		(-11.91)	(-12.11)	(-11.09)	(-12.38)	(-11.79)	(-12.66)	(-11.69)	(-12.35)
YEAR_2008		-0.616***	-0.581***	-0.595***	-0.578***	-0.638***	-0.597***	-0.605***	-0.567***
		(-13.95)	(-19.85)	(-13.00)	(-19.08)	(-13.61)	(-18.95)	(-13.52)	(-18.85)
YEAR_2009		0.146***	0.061*	0.129***	0.057	0.131**	0.075**	0.113**	0.085**
		(2.91)	(1.77)	(2.44)	(1.56)	(2.53)	(2.17)	(2.04)	(2.31)
$GROWTH\_SALES_{i,t}$						0.068	0.144***	0.034	0.104**
						(1.47)	(3.55)	(1.26)	(2.34)
$lnSIZE\_MV_{i,t}$						0.019*	0.029***	0.037***	0.037***
						(1.76)	(3.62)	(3.16)	(5.00)
$LEVERAGE_{i,t-1}$						$4.84*10^{-5}$**	$1.21*10^{-4}$	$4.05*10^{-5}$**	$7.70*10^{-5}$***
						(2.09)	(0.24)	(1.88)	(4.46)
$RESOURCES_{i,t}$						0.096	-0.054	0.128	0.055
						(1.21)	(-0.92)	(1.46)	(0.91)
$GENERAL\_INDUSTRIALS_{i,t}$						-0.001	-0.017	-0.029	-0.031
						(-0.02)	(-0.47)	(-0.80)	(-0.98)
$CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-0.171***	-0.165***	-0.166***	-0.165***
						(-3.97)	(-3.44)	(-4.23)	(-3.43)
$NON\text{-}CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-0.104**	-0.122***	-0.137***	-0.133***
						(-2.52)	(-3.27)	(-3.55)	(-3.68)
$CYCLICAL\_SERVICES_{i,t}$						-0.109***	-0.134***	-0.094***	-0.112***
						(-3.07)	(-3.99)	(-2.68)	(-3.39)
$NON\_CYCLICAL\_SERVICES_{i,t}$						-0.232***	-0.191**	-0.332***	-0.230***
						(-3.26)	(-2.44)	(-5.00)	(-2.80)
$UTILITIES_{i,t}$						-0.079*	-0.107**	-0.139***	-0.133***
						(-1.86)	(-2.56)	(-3.29)	(-3.26)
$INFORMATION\_TECHNOLOGY_{i,t}$						0.043	-0.090*	0.048	-0.059
						(0.51)	(-1.89)	(0.53)	(-1.33)
$FINANCE_{i,t}$						-0.030	-0.074*	-0.022	-0.065*
						(-0.72)	(-1.96)	(-0.52)	(-1.65)
N		895	856	762	726	895	855	762	720
F-value		52.13***	91.21***	45.05***	94.40***	31.46***	43.07***	33.04***	51.37***
Adjusted R^2		0.392	0.477	0.398	0.507	0.406	0.502	0.414	0.521
Max VIF		1.74	1.95	1.61	1.78	5.34	5.16	5.25	5.06
Mean VIF		1.50	1.61	1.45	1.55	2.10	2.12	2.03	2.01

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Stock return of firm i, period t is dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $\Delta (E+GIM)_{i,t,t-1}$ is changes in pre-impairment net earnings of firm i from period t-1 to t; $GIM_{i,t}$ is reported goodwill-impairment losses of firm i, period t; $\Delta GIM_{i,t,t-1}$ is changes in reported goodwill-impairment losses of firm i from period t-1 to t; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, period from t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of equity-market value of firm i, time t; $LEVERAGE_{i,t-1}$ is debt-to-equity ratio of firm i, time t-1. YEAR_2006, YEAR_2007, YEAR_2008, YEAR_2009 are dummy variables equal 1 if the year is 2006, 2007, 2008 and 2009 respectively and otherwise 0. YEAR_2005 is used as benchmark year. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector. Goodwill-impairment losses take positive values. Regression coefficients are unstandardised. t-statistics are given in parentheses. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). Observations with Cook's distance larger than 4/n where n is total number of observations are considered as outliers.

Table A14 – Excluding 2008 observations – hypothesis 1c

		Stock return t							
		Main model				***Main model with control variables***			
		Available sample		*Non-missing*		*Available sample*		*Non-missing*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*
Intercept		0 .052	0.048**	0.071*	0.063***	0.435	0.228	-0.047	-0.047
		(1.21)	(2.32)	(1.80)	(2.92)	(1.53)	(1.06)	(-0.16)	(-0.21)
$(E+GIM)_{i,t}$	+	2.375***	1.837***	2.051***	1.726***	2.226***	1.670***	1.724***	1.570***
		(3.80)	(7.56)	(3.84)	(6.99)	(3.32)	(6.82)	(3.21)	(6.08)
$\Delta\ (E+GIM)_{i,t,t-1}$	+	-0.894*	-0.396**	-0.487*	-0.301	-0.853*	-0.270**	-0.371	-0.197*
		(-1.83)	(-2.58)	(-1.64)	(-1.58)	(-1.66)	(-1.99)	(-1.24)	(-1.64)
$GIM_{i,t}$	-	-0.842	-0.317	-0.741	-0.385	-0.724	-0.223	-0.648	-0.223
		(-1.27)	(-0.41)	(-1.17)	(-1.08)	(-0.98)	(-0.32)	(-0.97)	(-0.38)
$\Delta GIM_{i,t,t-1}$	-	-0.380***	-1.396**	-0.390***	-0.444***	-0.397***	-1.429***	-0.410***	-1.374***
		(-7.26)	(-2.46)	(-7.72)	(-14.34)	(-7.68)	(-3.49)	(-7.95)	(-3.32)
$GROWTH\_SALES_{i,t}$						0.024	0.066	-0.004	0.008
						(0.87)	(1.25)	(-0.17)	(0.13)
$lnSIZE\_MV_{i,t}$						-0.014	-0.004	0.011	0.010
						(-0.97)	(-0.34)	(0.72)	(0.98)
$LEVERAGE_{i,t-1}$						$9.98*10^{-5}$***	$-2.37*10^{-4}$	$9.54*10^{-5}$***	$-2.56*10^{-4}$
						(4.49)	(-0.38)	(4.22)	(-0.38)
$RESOURCES_{i,t}$						0.142	-0.018	0.191*	0.079
						(1.45)	(-0.26)	(1.64)	(1.12)
$GENERAL\_INDUSTRIALS_{i,t}$						-0.056	-0.066	-0.098**	-0.084**
						(-1.04)	(-1.50)	(-2.31)	(-2.09)
$CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-0.217***	-0.151***	-0.212***	-0.157***
						(-3.02)	(-3.02)	(-3.62)	(-3.15)
$NON\text{-}CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-0.095*	-0.115***	-0.149***	-0.139***
						(-1.75)	(-2.63)	(-3.20)	(-3.24)
$CYCLICAL\_SERVICES_{i,t}$						-0.128***	-0.140***	-0.121***	-0.127***
						(-2.95)	(-3.66)	(-3.02)	(-3.29)
$NON\_CYCLICAL\_SERVICES_{i,t}$						-0.066	-0.128**	-0.163*	-0.110
						(-0.68)	(-2.46)	(-1.85)	(-1.32)
$UTILITIES_{i,t}$						-0.083*	-0.110**	-0.147***	-0.136***
						(-1.77)	(-2.32)	(-3.26)	(-2.82)
$INFORMATION\_TECHNOLOGY_{i,t}$						0.044	-0.113	0.028	-0.077
						(0.46)	(-1.63)	(0.28)	(-1.10)
$FINANCE_{i,t}$						-0.107*	-0.135***	-0.076	-0.108**
						(-1.93)	(-2.78)	(-1.42)	(-2.10)
N		720	681	615	584	720	685	615	580
F-value		25.16***	21.81***	22.38***	104.00***	14.08***	6.97***	12.33***	5.59***
Adjusted R^2		0.158	0.106	0.144	0.148	0.167	0.106	0.159	0.104
Max VIF		1.44	1.58	1.44	1.42	4.85	4.84	4.86	4.82
Mean VIF		1.23	1.31	1.23	1.23	2.02	2.02	2.00	1.99

Stock return of firm i, period t is dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $\Delta\ (E+GIM)_{i,t,t-1}$ is changes in pre-impairment net earnings of firm i from period t-1 to t; $GIM_{i,t}$ is reported goodwill-impairment losses of firm i, period t; $\Delta GIM_{i,t,t-1}$ is changes in reported goodwill-impairment losses of firm i from period t-1 to t; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, period from t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of equity-market value of firm i, time t; $LEVERAGE_{i,t-1}$ is debt-to-equity ratio of firm i, time t-1. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector. Goodwill-impairment losses take positive values. Regression coefficients are unstandardised. t-statistics are given in parentheses. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). Observations with Cook's distance larger than 4/n where n is total number of observations are considered as outliers.

Table A15 – Excluding large book goodwill – hypothesis 1c

		Stock return t							
		Main model				***Main model with control variables***			
		Available sample		*Non-missing*		*Available sample*		*Non-missing*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*
Intercept		0.014	0.014 (0.77)	-0.005	-0.008	-0.584*	-0.632**	-1.030***	-0.774***
		(0.34)		(-0.12)	(-0.34)	(-1.93)	(-2.39)	(-2.89)	(-2.86)
$(E+GIM)_{i,t}$	+	1.631***	1.145***	1.690***	1.320***	1.486**	1.033***	1.342**	0.849***
		(2.86)	(5.58)	(3.14)	(5.50)	(2.55)	(4.40)	(2.56)	(3.48)
$\Delta\ (E+GIM)_{i,t,t-1}$	+	-0.438	0.517***	-0.022	0.648***	-0.386	0.376*	0.114	0.802***
		(-0.84)	(2.64)	(-0.07)	(3.22)	(-0.71)	(1.76)	(0.35)	(3.59)
$GIM_{i,t}$	-	-0.916**	-1.815*	-0.901**	-1.482	-0.808**	0.518	-0.800**	-1.115
		(-2.59)	(-1.93)	(-2.37)	(-1.43)	(-2.60)	(0.46)	(-2.54)	(-1.18)
$\Delta GIM_{i,t,t-1}$	-	-0.476	-1.513**	-0.369	-1.564**	-0.509	-2.860***	-0.388	-1.392**
		(-1.38)	(-2.46)	(-1.15)	(-2.48)	(-1.43)	(-3.04)	(-1.19)	(-2.18)
$GROWTH\_SALES_{i,t}$						0.049	0.014	0.019	-0.020
						(1.41)	(0.20)	(0.72)	(-0.26)
$lnSIZE\_MV_{i,t}$						0.035**	0.039***	0.056***	0.046***
						(2.37)	(3.09)	(3.27)	(3.57)
$LEVERAGE_{i,t-1}$						$1.16*10^{-4}$***	$-8.64*10^{-4}$	$1.05*10^{-4}$***	$-1.08*10^{-3}$
						(4.13)	(-1.23)	(3.18)	(-1.57)
$RESOURCES_{i,t}$						-0.050	-0.158**	-0.002	-0.079
						(-0.58)	(-2.31)	(-0.02)	(-1.15)
$GENERAL\_INDUSTRIALS_{i,t}$						-0.141***	-0.156***	-0.176***	-0.179***
						(-2.98)	(-3.61)	(-4.62)	(-4.82)
$CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-0.163***	-0.160***	-0.148***	-0.127***
						(-2.88)	(-2.98)	(-3.33)	(-2.86)
$NON\text{-}CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-0.241***	-0.258***	-0.271***	-0.268***
						(-5.44)	(-6.20)	(-6.21)	(-6.82)
$CYCLICAL\_SERVICES_{i,t}$						-0.154***	-0.193***	-0.135***	-0.161***
						(-3.83)	(-4.81)	(-3.47)	(-4.21)
$NON\_CYCLICAL\_SERVICES_{i,t}$						-0.175***	-0.199***	-0.245***	-0.231***
						(-2.75)	(-3.72)	(-3.27)	(-3.97)
$UTILITIES_{i,t}$						-0.191***	-0.215***	-0.231***	-0.217***
						(-4.19)	(-4.98)	(-4.76)	(-4.97)
$INFORMATION\_TECHNOLOGY_{i,t}$						-0.103**	-0.299***	-0.092	-0.252***
						(-2.02)	(-3.15)	(-1.59)	(-3.10)
$FINANCE_{i,t}$						-0.113***	-0.168***	-0.086**	-0.098**
						(-2.69)	(-4.41)	(-2.18)	(-2.57)
N		670	644	559	531	670	639	559	531
F-value		6.56***	34.20***	6.06***	29.87***	6.97***	11.19***	6.71***	8.83***
Adjusted R^2		0.114	0.164	0.114	0.151	0.119	0.164	0.134	0.167
Max VIF		1.75	2.16	1.56	1.74	4.11	3.99	4.11	3.97
Mean VIF		1.48	1.99	1.39	1.71	1.99	2.05	1.91	1.94

Stock return of firm i, period t is dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $\Delta\ (E+GIM)_{i,t,t-1}$ is changes in pre-impairment net earnings of firm i from period t-1 to t; $GIM_{i,t}$ is reported goodwill-impairment losses of firm i, period t; $\Delta GIM_{i,t,t-1}$ is changes in reported goodwill-impairment losses of firm i from period t-1 to t; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, period from t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of equity-market value of firm i, time t; $LEVERAGE_{i,t-1}$ is debt-to-equity ratio of firm i, time t-1. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector. Goodwill-impairment losses take positive values. Regression coefficients are unstandardised. t-statistics are given in parentheses. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). Observations with Cook's distance larger than 4/n where n is total number of observations are considered as outliers.

Table A16 – Excluding large goodwill-impairment losses – hypothesis 1c

		Stock return t							
		Main model				***Main model with control variables***			
		Available sample		*Non-missing*		*Available sample*		*Non-missing*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*
Intercept		0 .008	-0.014	-0.018	-0.039*	-0.586**	-0.603***	-0.975**	-0.684***
		(0.19)	(-0.74)	(-0.43)	(-1.96)	(-2.29)	(-2.87)	(-3.10)	(-2.96)
$(E+GIM)_{i,t}$	+	1.730***	1.502***	1.956***	1.867***	1.599***	1.260***	1.642***	1.476***
		(3.06)	(7.29)	(3.46)	(8.03)	(2.77)	(5.85)	(3.00)	(6.08)
$\Delta\ (E+GIM)_{i,t,t-1}$	+	-0.406	0.329*	0.047	0.320**	-0.344	0.325**	0.189	0.502***
		(-0.80)	(1.94)	(0.15)	(2.19)	(-0.65)	(1.98)	(0.60)	(2.96)
$GIM_{i,t}$	-	1.781	-0.105	1.365	-1.539	2.221	-2.492	1.585	-5.284*
		(0.44)	(-0.05)	(0.27)	(-0.56)	(0.59)	(-1.05)	(0.35)	(-1.99)
$\Delta GIM_{i,t,t-1}$	-	-0.436***	-1.616***	-0.435***	-1.482***	-0.463***	-1.735***	-0.463***	-1.815***
		(-7.97)	(-2.96)	(-6.68)	(-2.79)	(-8.37)	(-3.16)	(-7.01)	(-3.16)
$GROWTH\_SALES_{i,t}$						0.041	0.018	0.021	0.013
						(1.25)	(0.32)	(0.89)	(0.22)
$lnSIZE\_MV_{i,t}$						0.034***	0.036***	0.052***	0.039***
						(2.71)	(3.66)	(3.46)	(3.56)
$LEVERAGE_{i,t-1}$						$6.80*10^{-4}$	$-8.24*10^{-4}$*	$-8.46*10^{-4}$	$-8.08*10^{-4}$*
						(-1.05)	(-1.78)	(-1.18)	(-1.65)
$RESOURCES_{i,t}$						-0.027	-0.149**	0.029	-0.076**
						(-0.31)	(-2.16)	(0.30)	(-0.83)
$GENERAL\_INDUSTRIALS_{i,t}$						-0.116***	-0.158***	-0.135***	-0.160***
						(-2.71)	(-4.27)	(-3.82)	(-5.35)
$CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-0.162***	-0.123***	-0.149***	-0.100**
						(-2.92)	(-2.51)	(-3.13)	(-2.04)
$NON\text{-}CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-0.195***	-0.217***	-0.216***	-0.210***
						(-4.59)	(-5.86)	(-5.47)	(-5.99)
$CYCLICAL\_SERVICES_{i,t}$						-0.164***	-0.187***	-0.140***	-0.155***
						(-4.51)	(-5.35)	(-4.11)	(-4.83)
$NON\_CYCLICAL\_SERVICES_{i,t}$						-0.160**	-0.181***	-0.218***	-0.197***
						(-2.55)	(-3.41)	(-2.90)	(-3.06)
$UTILITIES_{i,t}$						-0.181***	-0.208***	-0.230***	-0.216***
						(-3.99)	(-4.85)	(-4.84)	(-5.11)
$INFORMATION\_TECHNOLOGY_{i,t}$						0.002	-0.158**	-0.002	-0.125**
						(0.02)	(-2.52)	(-0.02)	(-2.07)
$FINANCE_{i,t}$						-0.109**	-0.176***	-0.087**	-0.146***
						(-2.54)	(-4.73)	(-2.14)	(-3.65)
N		850	815	719	682	850	812	719	684
F-value		24.87***	29.26***	17.49***	34.08***	10.56***	10.25***	8.47***	11.19***
Adjusted R^2		0.118	0.135	0.127	0.132	0.126	0.137	0.144	0.159
Max VIF		1.64	1.74	1.38	1.44	4.99	4.85	4.91	4.75
Mean VIF		1.32	1.37	1.19	1.22	2.09	2.08	2.01	1.97

Stock return of firm i, period t is dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $\Delta\ (E+GIM)_{i,t,t-1}$ is changes in pre-impairment net earnings of firm i from period t-1 to t; $GIM_{i,t}$ is reported goodwill-impairment losses of firm i, period t; $\Delta GIM_{i,t,t-1}$ is changes in reported goodwill-impairment losses of firm i from period t-1 to t; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, period from t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of equity-market value of firm i, time t; $LEVERAGE_{i,t-1}$ is debt-to-equity ratio of firm i, time t-1. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector. Goodwill-impairment losses take positive values. Regression coefficients are unstandardised. t-statistics are given in parentheses. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). Observations with Cook's distance larger than 4/n where n is total number of observations are considered as outliers.

Table A17 – Stock return measured with time lag t+2 months – hypothesis 1c

		Stock return t+2months							
		Main model				***Main model with control variables***			
		Available sample		*Non-missing*		*Available sample*		*Non-missing*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusiv e outliers*
Intercept		0.071**	0.020	0.071**	-0.003	-0.525**	-0.602**	-0.736***	-0.723***
		(2.07)	(1.19)	(2.07)	(-0.16)	(-2.20)	(-2.60)	(-2.92)	(-3.08)
$(E+GIM)_{i,t}$	+	0.730	0.965***	0.730	1.236***	0.553	0.659***	0.811**	0.658***
		(1.62)	(5.13)	(1.62)	(5.09)	(1.21)	(3.28)	(2.33)	(2.83)
Δ $(E+GIM)_{i,t,t-1}$	+	0.097	0.284*	0.097	0.374**	0.167	0.366**	0.202	0.460***
		(0.27)	(1.78)	(0.27)	(2.18)	(0.46)	(2.21)	(0.59)	(2.68)
$GIM_{i,t}$	-	-0.471***	-0.738**	-0.471***	$-2.29*10^{-4}$	-0.368**	-0.426***	-0.380**	-0.376***
		(-2.98)	(-2.02)	(-2.98)	(-0.00)	(-2.24)	(-2.75)	(-2.49)	(-2.81)
$\Delta GIM_{i,t,t-1}$	-	-0.362***	-0.438***	-0.362***	-0.885***	-0.380***	-0.444***	-0.348***	-0.428***
		(-3.52)	(-9.71)	(-3.52)	(-3.01)	(-3.69)	(-9.70)	(-3.30)	(-11.28)
$GROWTH\_SALES_{i,t}$						0.013	-0.088	0.008	-0.102
						(0.34)	(-1.46)	(0.23)	(-1.57)
$lnSIZE\_MV_{i,t}$						0.034***	0.038***	0.041***	0.042***
						(2.97)	(3.45)	(3.50)	(3.79)
$LEVERAGE_{i,t-1}$						$2.08*10^{-4}$***	-0.001**	$2.00*10^{-4}$***	-0.001*
						(4.36)	(-2.08)	(4.41)	(-1.84)
$RESOURCES_{i,t}$						0.033	-0.051	0.053	0.076
						(0.39)	(-0.59)	(0.62)	(0.77)
$GENERAL\_INDUSTRIALS_{i,t}$						-0.101**	0.134***	-0.098**	-0.110**
						(-2.03)	(-2.64)	(-2.33)	(-2.44)
$CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-0.079	-0.150	-0.050	-0.048
						(-1.22)	(-1.52)	(-0.87)	(-0.67)
$NON\text{-}CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-0.199***	-0.207***	-0.188***	-0.195***
						(-3.94)	(-3.81)	(-4.32)	(-3.87)
$CYCLICAL\_SERVICES_{i,t}$						-0.142***	-0.165***	-0.102***	-0.123***
						(-3.17)	(-3.35)	(-2.62)	(-2.68)
$NON\_CYCLICAL\_SERVICES_{i,t}$						-0.221***	-0.239***	-0.213***	-0.234***
						(-3.79)	(-3.91)	(-3.47)	(-3.43)
$UTILITIES_{i,t}$						-0.173***	-0.212***	-0.191***	-0.210***
						(-3.19)	(-3.63)	(-3.83)	(-3.78)
$INFORMATION\_TECHNOLOGY_{i,t}$						-0.013	-0.183***	0.024	-0.125**
						(-0.15)	(-2.81)	(0.26)	(-2.14)
$FINANCE_{i,t}$						-0.122**	-0.136**	-0.086*	-0.110**
						(-2.50)	(-2.53)	(-1.94)	(-2.12)
N		896	863	762	731	896	863	762	727
F-value		29.02***	51.63***	35.46***	28.53***	11.86***	12.86***	12.43***	14.38***
Adjusted R^2		0.047	0.076	0.063	0.080	0.058	0.110	0.075	0.107
Max VIF		1.62	1.82	1.53	3.16	5.25	5.39	5.19	5.32
Mean VIF		1.43	1.44	1.38	2.34	2.17	2.22	2.11	2.11

Stock return of firm i, period t+2 months, is dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; Δ $(E+GIM)_{i,t,t-1}$ is changes in pre-impairment net earnings of firm i from period t-1 to t; $GIM_{i,t}$ is reported goodwill-impairment losses of firm i, period t; $\Delta GIM_{i,t,t-1}$ is changes in reported goodwill-impairment losses of firm i from period t-1 to t; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, period from t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of equity-market value of firm i, time t; $LEVERAGE_{i,t-1}$ is debt-to-equity ratio of firm i, time t-1. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector. Goodwill-impairment losses take positive values. Regression coefficients are unstandardised. t-statistics are given in parentheses. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). Observations with Cook's distance larger than 4/n where n is total number of observations are considered as outliers.

Table A18 – Stock return measured with time lag t+3 months – hypothesis 1c

		Stock return t+3 months							
		Main model				***Main model with control variables***			
		Available sample		*Non-missing*		*Available sample*		*Non-missing*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*
Intercept		0.051**	0.011 (0.58)	0.056**	0.007 (0.37)	-0.489**	-0.644***	-0.744***	-0.790***
		(2.17)		(2.02)		(-2.20)	(-2.97)	(-3.05)	(-3.33)
$(E+GIM)_{i,t}$	+	1.044***	1.098***	0.890***	1.145***	0.896***	0.766***	0.666**	0.962***
		(3.28)	(5.47)	(2.71)	(5.16)	(2.74)	(3.67)	(2.01)	(3.74)
$\Delta (E+GIM)_{i,t,t-1}$	+	-0.016	0 .218	0.145	0.239*	0.034	0.316**	0.220	0.307*
		(-0.04)	(1.58)	(0.42)	(1.64)	(0.09)	(2.08)	(0.63)	(1.90)
$GIM_{i,t}$	-	-0.209	-0.077	-0.231	-0.083	-0.141	0.278	-0.158	0.475
		(-1.52)	(-0.15)	(-1.34)	(-0.17)	(-0.97)	(0.45)	(-0.89)	(0.79)
$\Delta GIM_{i,t,t-1}$	-	-0.326*	-1.172**	-0.281	-1.130**	-0.336*	-1.423**	-0.288	-1.313**
		(-1.86)	(-2.36)	(-1.41)	(-2.35)	(-1.89)	(-2.44)	(-1.42)	(-2.48)
$GROWTH\_SALES_{i,t}$						-0.002	-0.015	-0.003	-0.034
						(-0.06)	(-0.25)	(-0.08)	(-0.52)
$lnSIZE\_MV_{i,t}$						0.032***	0.039***	0.044***	0.044***
						(3.05)	(3.82)	(3.75)	(3.89)
$LEVERAGE_{i,t-1}$						$2.40*10^{-4}$***	-0.002**	$2.45*10^{-4}$***	-0.001**
						(4.79)	(-2.43)	(5.46)	(-2.10)
$RESOURCES_{i,t}$						-0.064	-0.131*	-0.002	-0.004
						(-0.86)	(-1.75)	(-0.02)	(-0.04)
$GENERAL\_INDUSTRIALS_{i,t}$						-0.119**	-0.121**	-0.120***	-0.103**
						(-2.33)	(-2.50)	(-2.66)	(-2.36)
$CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-0.047	-0.043	-0.017	-0.013
						(-0.87)	(-0.56)	(-0.34)	(-0.18)
$NON\text{-}CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-0.226***	-0.214***	-0.232***	-0.202***
						(-4.35)	(-4.06)	(-4.68)	(-4.12)
$CYCLICAL\_SERVICES_{i,t}$						-0.165***	-0.174***	-0.128***	-0.129***
						(-3.51)	(-3.77)	(-2.81)	(-3.02)
$NON\_CYCLICAL\_SERVICES_{i,t}$						-0.258***	-0.220***	-0.283***	-0.288***
						(-3.74)	(-3.29)	(-3.37)	(-4.44)
$UTILITIES_{i,t}$						-0.223***	-0.222***	-0.235***	-0.216***
						(-4.19)	(-4.02)	(-4.40)	(-3.94)
$INFORMATION\_TECHNOLOGY_{i,t}$						-0.033	-0.160**	0.016	-0.112
						(-0.37)	(-2.37)	(0.18)	(-1.56)
$FINANCE_{i,t}$						-0.155***	-0.141***	-0.118**	-0.101**
						(-3.17)	(-2.85)	(-2.51)	(-2.06)
N		896	866	762	737	896	864	762	727
F-value		11.03***	26.02***	8.07***	22.11***	7.87***	7.72***	7.51***	12.71***
Adjusted R^2		0.064	0.077	0.065	0.075	0.069	0.088	0.079	0.107
Max VIF		1.74	1.76	1.74	1.69	5.25	5.34	5.19	5.27
Mean VIF		1.51	1.71	1.51	1.62	2.19	2.27	2.14	2.21

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Stock return of firm i, period t+3 months, is dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $\Delta (E+GIM)_{i,t,t-1}$ is changes in pre-impairment net earnings of firm i from period t-1 to t; $GIM_{i,t}$ is reported goodwill-impairment losses of firm i, period t; $\Delta GIM_{i,t,t-1}$ is changes in reported goodwill-impairment losses of firm i from period t-1 to t; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, period from t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of equity-market value of firm i, time t; $LEVERAGE_{i,t-1}$ is debt-to-equity ratio of firm i, time t-1. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector. Goodwill-impairment losses take positive values. Regression coefficients are unstandardised. t-statistics are given in parentheses. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). Observations with Cook's distance larger than 4/n where n is total number of observations are considered as outliers.

Table A19 – Stock return measured with time lag t+4 months – hypothesis 1c

		Stock return t+4 months							
		Main model				Main model with control variables			
		Available sample		Non-missing		Available sample		Non-missing	
Test variables	Pred.	Inclusive outliers	Exclusive outliers	Inclusive outliers	Exclusive outliers	Inclusive outliers	Exclusive outliers	Inclusive outliers	Exclusive outliers
Intercept		0 .073*** (3.45)	0.032* (1.65)	0.065*** (2.70)	0.022 (1.12)	-0.377* (-1.85)	-0.579*** (-2.73)	-0.582*** (-2.64)	-0.773*** (-3.51)
$(E+GIM)_{i,t}$	+	0.669** (2.60)	0.994*** (4.64)	0.773*** (2.65)	1.045*** (4.68)	0.542** (2.06)	0.416*** (2.89)	0.580** (2.02)	0.670*** (3.01)
$\Delta\ (E+GIM)_{i,t,t-1}$	+	0.041 (0.18)	0.265* (1.64)	-0.030 (-0.13)	0.353** (2.04)	0.082 (0.36)	0.392*** (3.10)	0.031 (0.13)	0.330*** (2.73)
$GIM_{i,t}$	-	-0.299* (-1.86)	-0.394 (-0.74)	-0.305* (-1.96)	0.016 (0.04)	-0.217 (-1.41)	0.288 (0.54)	-0.225 (-1.57)	0.240 (0.48)
$\Delta GIM_{i,t,t-1}$	-	-0.158 (-0.82)	-0.763 (-1.62)	-0.159 (-0.83)	-0.697 (-1.57)	-0.182 (-0.97)	-0.849* (-1.75)	-0.177 (-0.96)	-0.798* (-1.76)
$GROWTH\_SALES_{i,t}$						0.032 (1.36)	0.012 (0.52)	0.019 (0.84)	-0.040 (-0.63)
$lnSIZE\_MV_{i,t}$						0.028*** (2.92)	0.038*** (3.76)	0.036*** (3.45)	0.043*** (4.08)
$LEVERAGE_{i,t-1}$						$1.66*10^{-4}$*** (4.31)	-0.001* (-1.81)	$1.63*10^{-4}$*** (4.70)	-0.002** (-2.37)
$RESOURCES_{i,t}$						-0.043 (-0.61)	-0.028 (-0.35)	0.010 (0.13)	0.038 (0.46)
$GENERAL\_INDUSTRIALS_{i,t}$						-0.138** (-2.50)	-0.144*** (-2.71)	-0.123** (-2.31)	-0.095* (-1.93)
$CYCLICAL\_CONSUMER\_GOODS_{i,t}$						0.027 (0.41)	0.038 (0.53)	0.063 (1.03)	0.090 (1.33)
$NON\text{-}CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-0.233*** (-4.06)	-0.237*** (-4.16)	-0.223*** (-4.02)	-0.198*** (-3.55)
$CYCLICAL\_SERVICES_{i,t}$						-0.169*** (-3.29)	-0.178*** (-3.53)	-0.126** (-2.57)	-0.109** (-2.26)
$NON\_CYCLICAL\_SERVICES_{i,t}$						-0.247*** (-2.93)	-0.262*** (-4.33)	-0.253** (-2.52)	-0.266*** (-4.69)
$UTILITIES_{i,t}$						-0.204*** (-3.56)	-0.217*** (-3.74)	-0.206*** (-3.59)	-0.185*** (-3.18)
$INFORMATION\_TECHNOLOGY_{i,t}$						-0.031 (-0.34)	-0.137** (-2.09)	0.041 (0.47)	-0.018 (-0.26)
$FINANCE_{i,t}$						-0.162*** (-2.98)	-0.172*** (-3.20)	-0.113** (-2.09)	-0.098* (-1.82)
N		896	864	762	733	896	859	762	722
F-value		13.45***	14.76***	12.36***	14.89***	7.92***	10.64***	7.92***	10.36***
Adjusted R^2		0.038	0.056	0.031	0.060	0.052	0.090	0.051	0.087
Max VIF		1.74	1.71	1.66	3.31	5.25	5.44	5.19	5.55
Mean VIF		1.67	1.55	1.60	2.43	2.23	2.50	2.16	2.48

Stock return of firm i, period t+4 months, is dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $\Delta\ (E+GIM)_{i,t,t-1}$ is changes in pre-impairment net earnings of firm i from period t-1 to t; $GIM_{i,t}$ is reported goodwill-impairment losses of firm i, period t; $\Delta GIM_{i,t,t-1}$ is changes in reported goodwill-impairment losses of firm i from period t-1 to t; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, period from t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of equity-market value of firm i, time t; $LEVERAGE_{i,t-1}$ is debt-to-equity ratio of firm i, time t-1. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector. Goodwill-impairment losses take positive values. Regression coefficients are unstandardised. t-statistics are given in parentheses. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). Observations with Cook's distance larger than 4/n where n is total number of observations are considered as outliers.

Table A20 – Control for size – hypothesis 1c

		Unstandardised residuals t							
		Main model				*Main model with control variables*			
		Available sample		*Non-missing*		*Available sample*		*Non-missing*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*
Intercept		-0.123***	-0.135***	-0.131***	-0.152***	0.066	0.049	-0.283	-0.123
		(-3.44)	(-7.66)	(-3.86)	(-8.06)	(0.27)	(0.22)	(-1.00)	(-0.52)
$(E+GIM)_{i,t}$	+	1.523***	1.154***	1.549***	1.416***	1.502***	1.184***	1.395***	0.986***
		(2.96)	(6.01)	(3.38)	(6.40)	(2.84)	(5.45)	(3.09)	(4.25)
$\Delta\ (E+GIM)_{i,t,t-1}$	+	-0.368	0.467***	0.014	0.490***	-0.365	0.208	0.070	0.536***
		(-0.79)	(2.74)	(0.05)	(2.95)	(-0.76)	(0.264)	(0.25)	(3.30)
$GIM_{i,t}$	-	-0.696***	-1.302**	-0.644***	-1.259**	-0.635***	-0.147	-0.579***	-1.321**
		(-3.96)	(-2.35)	(-3.79)	(-2.20)	(-3.56)	(-0.20)	(-3.47)	(-2.52)
$\Delta GIM_{i,t,t-1}$	-	-0.458***	-1.605***	-0.459***	-1.365***	-0.471***	-1.835***	-0.472***	-0.556***
		(-8.02)	(-3.05)	(-7.64)	(-2.86)	(-8.19)	(-3.47)	(-7.83)	(-13.27)
$GROWTH\_SALES_{i,t}$						0.037	-0.010	0.010	-0.037
						(1.14)	(-0.18)	(0.33)	(-0.60)
$lnSIZE\_MV_{i,t}$						-0.003	$4.79*10^{-4}$	0.014	$4.79*10^{-4}$
						(-0.24)	(-0.05)	(1.00)	(-0.05)
$LEVERAGE_{i,t-1}$						$1.17*10^{-4}$***	$7.19*10^{-4}$	$1.08*10^{-4}$***	$-8.43*10^{-4}$
						(4.03)	(-1.05)	(3.49)	(-1.15)
$RESOURCES_{i,t}$						-0.052	-0.160**	0.004	-0.055
						(-0.60)	(-2.26)	(0.05)	(-0.62)
$GENERAL\_INDUSTRIALS_{i,t}$						-0.132***	-0.162***	-0.145***	-0.157***
						(-3.16)	(-4.39)	(-4.06)	(-4.90)
$CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-0.154***	-0.140***	-0.140***	-0.111***
						(-2.84)	(-2.89)	(-3.18)	(-2.65)
$NON\text{-}CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-0.198***	-0.221***	-0.216***	-0.218***
						(-4.66)	(-5.56)	(-5.40)	(-5.74)
$CYCLICAL\_SERVICES_{i,t}$						-0.166***	-0.120***	-0.139***	-0.160***
						(-4.62)	(-5.54)	(-4.11)	(-4.75)
$NON\_CYCLICAL\_SERVICES_{i,t}$						-0.162**	-0.152**	-0.236***	-0.195***
						(-2.43)	(-2.15)	(-3.52)	(-2.84)
$UTILITIES_{i,t}$						-0.195***	-0.229***	-0.240***	-0.226***
						(-4.18)	(-4.85)	(-4.99)	(-5.06)
$INFORMATION\_TECHNOLOGY_{i,t}$						-0.030	-0.168***	-0.014	-0.137**
						(-0.36)	(-2.63)	(-0.15)	(-2.29)
$FINANCE_{i,t}$						-0.110***	-0.160***	-0.087**	-0.104***
						(-2.61)	(-4.23)	(-2.18)	(-2.63)
N		895	861	762	727	895	858	762	729
F-value		24.37***	38.86***	21.72***	33.29***	12.78***	10.34***	11.45***	19.14***
Adjusted R^2		0.117	0.144	0.124	0.139	0.118	0.121	0.128	0.154
Max VIF		1.69	1.94	1.52	1.52	5.25	5.10	5.19	5.03
Mean VIF		1.39	1.63	1.30	1.44	2.16	2.19	2.09	2.05

The dependent variable is the unstandardised residuals from a regression of stock return on size where size is measured as natural logarithm of equity-market value at the end of the fiscal year. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $\Delta\ (E+GIM)_{i,t,t-1}$ is changes in pre-impairment net earnings of firm i from period t-1 to t; $GIM_{i,t}$ is reported goodwill-impairment losses of firm i, period t; $\Delta GIM_{i,t,t-1}$ is changes in reported goodwill-impairment losses of firm i from period t-1 to t; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, period from t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of equity-market value of firm i, time t; $LEVERAGE_{i,t-1}$ is debt-to-equity ratio of firm i, time t-1. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector. Goodwill-impairment losses take positive values. Regression coefficients are unstandardised. t-statistics are given in parentheses. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). Observations with Cook's distance larger than 4/n where n is total number of observations are considered as outliers.

Table A21 – Split on stock return, return-on-assets, growth in sales, market-to-book and impairment losses – hypothesis 2a

Stock price t

		Split on stock return		*Split on return-on-assets*		*Split on growth*		*Split on market-to-book*		*Split on goodwill-impairment losses*	
		Available sample		*Available sample*		*Available sample*		*Available sample*		*Available sample*	
Test variables	*Pred*	*High stock return*	*Low stock return*	*High return-on-assets*	*Low return-on-assets*	*High growth in total sales*	*Low growth in total sales*	*High market-to-book*	*Low market-to-book*	*No impairment losses*	*Impairment losses*
Intercept		1.609***	1.996***	3.487***	1.901***	2.441***	2.137***	1.333***	2.015***	1.367***	3.347***
		(2.74)	(6.98)	(5.15)	(4.92)	(3.55)	(4.64)	(4.07)	(4.51)	(2.86)	(4.48)
$(E+GIM)_{i,t}$	+	3.542**	-0.004	2.550**	-0.789	2.523***	0.818	2.688***	2.168***	3.545**	2.743***
		(2.58)	(-0.00)	(2.47)	(-0.69)	(2.83)	(0.92)	(2.71)	(2.68)	(2.47)	(4.79)
$GAM_{i,t}$		19.555***	11.166	19.609*	6.347	21.900***	-1.545	17.865***	-7.342	19.064***	3.994
		(2.66)	(1.51)	(1.70)	(1.44)	(2.73)	(-0.10)	(2.84)	(-1.49)	(3.08)	(0.36)
$(EQCA\text{-}GWCA)_{i,t-1}$	+	1.184***	0.566***	1.038*	0.810***	0.798*	0.535***	2.569***	0.370***	1.015***	0.356**
		(2.96)	(2.93)	(1.71)	(3.91)	(1.78)	(3.37)	(6.22)	(2.89)	(2.69)	(2.14)
$GWCA_{i,t-1}$	+	0.907**	0.262	1.306	0.659*	0.053	2.016*	2.805***	0.912**	0.928*	0.466
		(2.22)	(0.43)	(0.99)	(1.92)	(0.05)	(1.90)	(3.56)	(2.50)	(1.85)	(0.77)
N		190	183	183	197	184	188	326	187	574	193
F-value		17.00***	11.37***	11.42***	7.47***	22.89***	10.00***	54.37***	95.43***	16.95***	11.06***
Adjusted R^2		0.682	0.275	0.499	0.366	0.559	0.386	0.709	0.581	0.571	0.412
Max VIF		2.70	5.42	2.28	6.39	2.63	7.55	3.28	6.39	3.64	4.62
Mean VIF		2.25	3.25	2.18	3.70	2.49	4.30	2.26	4.18	2.48	3.02

Stock price of firm i, time t, is dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $GAM_{i,t}$ is as-if accounted goodwill-amortisation charges of firm i, period t; $(EQCA\text{-}GWCA)_{i,t-1}$ is as-if accounted book equity reduced by book goodwill under the amortisation method of firm i, time t-1; $GWCA_{i,t-1}$ is as-if accounted book goodwill under the amortisation method of firm i, time t-1. Goodwill-amortisation charges take positive values. Regression coefficients are unstandardised. t-statistics are given in parentheses. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). Observations with Cook's distance larger than 4/n where n is total number of observations are considered as outliers. Subsamples of high firm-year observations are those with values on split variables higher than third quartile. Subsamples of low observations are those with values on split variables lower than the first quartile. High values on market-to-book are those above three whereas low values on market-to-book are those below 1.50.

Table A22 – Split on stock return, return-on-assets, growth in total sales and market-to-book – control variables – hypothesis 2a

		Stock price t									
		Split on stock return		***Split on return-on-assets***		***Split on growth***		***Split on market-to-book***		***Split on goodwill-impairment losses***	
		Available sample		*Available sample*		*Available sample*		*Available sample*		*Available sample*	
Test variables	*Pred.*	*High stock return*	*Low stock return*	*High return-on-assets*	*Low return-on-assets*	*High growth in total sales*	*Low growth in total sales*	*High market-to-book*	*Low market-to-book*	*Impairment losses*	*Non-impairment losses*
Intercept		-13.754**	-15.972***	-39.043***	-4.879	-20.516**	-21.063***	-17.176***	-14.346***	-23.879***	-14.322**
		(-2.01)	(-2.76)	(-4.86)	(-1.02)	(-2.35)	(-3.28)	(-3.94)	(-2.96)	(-6.80)	(-2.12)
$(E+GIM)_{i,t}$	+	2.941***	-0.191	1.401**	-0.816**	1.844***	0.432	2.143***	1.812***	2.474***	2.388***
		(5.64)	(-0.60)	(2.55)	(-2.31)	(3.11)	(1.23)	(6.81)	(4.92)	(8.62)	(5.21)
$GAM_{i,t}$		20.797***	5.934	21.411***	6.533	20.668***	1.305	17.792***	-7.145	18.377***	4.243
		(3.66)	(1.06)	(3.15)	(1.14)	(3.79)	(0.14)	(3.52)	(-1.40)	(5.26)	(0.58)
$(EQCA\text{-}GWCA)_{i,t-1}$	+	1.027***	0.519***	0.661***	0.737***	0.703***	0.436***	2.368***	0.291***	0.939***	0.379***
		(6.18)	(4.67)	(2.90)	(7.34)	(3.96)	(4.16)	(14.04)	(3.65)	(10.89)	(2.95)
$GWCA_{i,t-1}$	+	0.476	0.549	0.475	0.643	-0.214	1.586***	2.433***	0.801**	0.644**	0.222
		(1.22)	(1.32)	(0.67)	(1.59)	(-0.44)	(2.76)	(5.72)	(2.25)	(2.54)	(0.40)

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		Stock price t									
		Split on stock return		***Split on return-on-assets***		***Split on growth***		***Split on market-to-book***		***Split on goodwill-impairment losses***	
		Available sample		*Available sample*		*Available sample*		*Available sample*		*Available sample*	
Test variables	*Pred.*	*High stock return*	*Low stock return*	*High return-on-assets*	*Low return-on-assets*	*High growth in total sales*	*Low growth in total sales*	*High market-to-book*	*Low market-to-book*	*Impairment losses*	*Non-impairment losses*
GROWTH_SALES$_{i,t}$		0.273 (0.71)	-0.306 (-0.25)	0.381 (0.79)	0.578 (0.64)	0.144 (0.31)	-2.217 (-1.20)	0.249 (0.76)	0.161 (0.17)	0.379 (1.13)	1.172 (0.60)
lnSIZE_MV$_{i,t}$		0.892*** (2.72)	1.002*** (3.72)	2.070*** (5.31)	0.421* (1.89)	1.319*** (3.19)	1.167*** (3.92)	0 .904*** (4.27)	0.864*** (3.92)	1.354*** (8.09)	0.866*** (2.80)
RESOURCES$_{i,t}$		-2.471* (-1.65)	-3.139 (-1.36)	-0.076 (-0.04)	5.112** (2.02)	-4.514** (-2.30)	-0.898 (-0.37)	1.219 (1.00)	-1.234 (-0.61)	-1.402 (-1.34)	-2.160 (-0.85)
GENERAL_ INDUSTRIALS$_{i,t}$		-3.077** (-2.52)	-2.880 (-1.61)	0.337 (0.20)	-2.432* (-1.85)	-4.220** (-2.51)	-1.748 (-0.99)	-0.102 (-0.11)	-2.283 (-0.70)	-2.343*** (-3.19)	-0.314 (-0.16)
CYCLICAL_ CONSUMER_ GOODS$_{i,t}$		-4.262 (-1.06)	-3.277 (-0.85)	Omitted	-2.316 (-0.72)	-5.793 (-1.60)	-2.835 (-0.91)	-1.221 (-0.58)	-1.369 (-0.81)	-2.190 (-0.82)	-2.176 (-0.76)
NON-CYCLICAL_ CONSUMER_GOODS$_{i,t}$		-1.831 (-1.13)	0.082 (0.04)	1.216 (0.53)	-0.934 (-0.65)	-5.206** (-2.29)	0.779 (0.40)	1.159 (1.05)	-1.490 (-0.99)	-1.347 (-1.51)	1.213 (0.55)
CYCLICAL_SERVICES$_{i,t}$		-3.050** (-2.49)	-2.374 (-1.32)	-0.836 (-0.46)	-2.269* (-1.80)	-4.445** (-2.53)	-1.010 (-0.58)	-0.148 (-0.17)	-4.376* (-1.70)	-3.658*** (-4.96)	-0.185 (-0.09)
NON_CYCLICAL_ SERVICES$_{i,t}$		Omitted[38]	Omitted	Omitted	-4.587* (-1.83)	Omitted	-9.640** (-2.22)	-3.330 (-0.94)	-5.092*** (-2.72)	-6.526*** (-2.88)	-6.671 (-1.23)
UTILITIES$_{i,t}$		-4.661*** (-2.61)	-3.757* (-1.77)	-4.087 (-1.25)	-0.911 (-0.65)	-5.914*** (-2.67)	-2.089 (-0.97)	-2.120* (-1.88)	-0.226*** (-5.06)	-4.165*** (-4.36)	-3.095 (-1.28)
INFORMATION_ TECHNOLOGY$_{i,t}$		-4.755*** (-2.63)	-4.115* (-1.94)	-3.520 (-1.51)	-3.002* (-1.75)	-6.450*** (-3.25)	-2.089 (-0.92)	-1.585 (-1.19)	-2.492 (-1.37)	-4.311*** (-4.52)	-2.004 (-0.58)
FINANCE$_{i,t}$		-3.814*** (-2.78)	-2.755*** (-1.46)	-0.115 (-0.06)	-2.348* (-1.81)	-4.236** (-2.42)	-1.357 (-0.73)	-1.031 (-0.99)	-0.821 (-0.52)	-2.768*** (-3.35)	-0.906 (-0.42)

Table continues on next page.

[38] No observations.

Table continues from previous page.

N	190	183	183	197	184	188	326	187	574	193
F-value	32.25***	7.89***	23.54***	11.10***	19.49***	11.63***	61.53***	19.84***	69.26***	10.63***
Adjusted R^2	0.698	0.346	0.617	0.436	0.586	0.460	0.736	0.603	0.641	0.429
Max VIF	3.87	11.70	5.56	8.30	5.06	9.30	4.87	11.22	4.96	6.86
Mean VIF	2.36	4.32	2.93	3.48	2.85	4.02	2.45	4.62	2.47	3.26

Stock price of firm i, time t, is dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $GAM_{i,t}$ is as-if accounted goodwill-amortisation charges of firm i, period t; $(EQCA\text{-}GWCA)_{i,t-1}$ is as-if accounted book equity reduced by book goodwill under the amortisation method of firm i, time t-1; $GWCA_{i,t-1}$ is as-if accounted book goodwill under the amortisation method of firm i, time t-1; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, from period t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of equity-market value of firm i, time t. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector. Goodwill-amortisation charges take positive values. Regression coefficients are unstandardised. t-statistics are given in parentheses. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). Observations with Cook's distance larger than 4/n where n is total number of observations are considered as outliers. Subsamples of high firm-year observations are those with values on split variables higher than third quartile. Subsamples of low observations are those with values on split variables lower than the first quartile. High values on market-to-book are those above three whereas low values on market-to-book are those below 1.50. The t-statistics are not White-adjusted and clustered at firm level due to lack of degrees of freedom.

Table A23 – Including year dummies – hypothesis 2a

		Stock price t							
		Main model with year-dummies				***Main model, year-dummies and control variables***			
		Available sample		*Non-missing*		*Available sample*		*Non-missing*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*
Intercept		2.734***	2.010***	2.755***	2.011***	-14.261**	-11.736***	-14.521**	-11.875***
		(7.68)	(8.02)	(7.50)	(7.96)	(-2.01)	(-3.06)	(-2.05)	(-3.08)
$(E+GIM)_{i,t}$	+	3.016***	3.965***	3.049***	3.958***	2.400***	3.415***	2.422***	3.490***
		(3.45)	(8.58)	(3.44)	(8.57)	(2.63)	(7.61)	(2.64)	(7.19)
$GAM_{i,t}$		15.584***	8.201**	15.519***	8.134*	15.408***	9.716**	15.361***	9.677**
		(2.78)	(1.97)	(2.78)	(1.94)	(2.78)	(2.17)	(2.78)	(2.15)
$(EQCA\text{-}GWCA)_{i,t-1}$	+	0.673***	0.758***	0.681***	0.755***	0.610***	0.681***	0.618***	0.673***
		(2.90)	(8.08)	(2.95)	(8.04)	(2.82)	(7.59)	(2.85)	(7.33)
$GWCA_{i,t-1}$	+	0.632*	0.800**	0.633*	0.803**	0.388	0.418	0.385	0.401
		(1.68)	(2.56)	(1.68)	(2.55)	(1.17)	(1.35)	(1.16)	(1.27)
YEAR_2006		0.388**	0.484***	0.343*	0.490***	0.237	0.387**	0.168	0.450***
		(2.14)	(2.69)	(1.84)	(2.71)	(1.23)	(2.20)	(0.84)	(2.73)
YEAR_2007		-0.226	-0.186	-0.272	-0.179	-0.202	-0.109	-0.275	-0.115
		(-0.67)	(-0.86)	(-0.79)	(-0.82)	(-0.65)	(-0.48)	(-0.88)	(-0.50)
YEAR_2008		-2.551***	-1.408***	-2.594***	-1.402***	-2.107***	-1.170***	-2.171***	-1.158***
		(-4.34)	(-5.58)	(-4.39)	(-5.57)	(-3.95)	(-4.70)	(-4.04)	(-4.59)
YEAR_2009		-0.575	-0.164	-0.603	-0.150	-0.468	-0.070	-0.522	-0.049
		(-1.23)	(-0.68)	(-1.27)	(-0.62)	(-1.09)	(-0.28)	(-1.19)	(-0.19)
$GROWTH\_SALES_{i,t}$						0.379*	0.517***	0.373*	0.519***
						(1.83)	(3.22)	(1.80)	(3.21)
$lnSIZE\_MV_{i,t}$						0.945***	0.752***	0.959***	0.756***
						(2.83)	(4.05)	(2.86)	(4.04)
$RESOURCES_{i,t}$						-2.524	-1.582	-2.420	-1.625
						(-0.92)	(-1.26)	(-0.88)	(-1.25)
$GENERAL\_INDUSTRIALS_{i,t}$						-2.417*	-1.603*	-2.378*	-1.565*
						(-1.87)	(-1.85)	(-1.82)	(-1.76)
$CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-3.890***	-2.656**	-3.875***	-2.638**
						(-2.79)	(-2.59)	(-2.75)	(-2.54)
$NON\text{-}CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-0.646	-0.628	-0.649	-0.604
						(-0.38)	(-0.60)	(-0.38)	(-0.56)
$CYCLICAL\_SERVICES_{i,t}$						-3.319**	-2.316***	-3.300**	-2.237***
						(-2.48)	(-2.67)	(-2.41)	(-2.49)
$NON\_CYCLICAL\_SERVICES_{i,t}$						-7.222***	-4.350***	-7.288***	-4.307***
						(-4.10)	(-4.23)	(-4.03)	(-4.05)
$UTILITIES_{i,t}$						-3.796**	-2.117*	-3.806**	-2.105*
						(-2.30)	(-1.80)	(-2.27)	(-1.76)
$INFORMATION\_TECHNOLOGY_{i,t}$						-4.390***	-2.887***	-4.354***	-2.849***
						(-3.34)	(-3.17)	(-3.26)	(-3.05)
$FINANCE_{i,t}$						-2.822**	-1.863**	-2.785**	-1.815*
						(-2.11)	(-2.01)	(-2.04)	(-1.91)
N		767	721	762	717	767	724	762	721
F-value		22.54***	45.17***	22.54***	45.20***	15.10***	34.05***	15.01***	34.08***
Adjusted R^2		0.500	0.596	0.500	0.595	0.552	0.639	0.550	0.635
Max VIF		4.00	3.86	4.00	3.87	5.22	5.35	5.31	5.47
Mean VIF		2.12	2.03	2.12	2.04	2.43	2.37	2.44	2.40

Table continues on next page.

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Stock price of firm i, time t, is dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $GAM_{i,t}$ is as-if accounted goodwill-amortisation charges of firm i, period t; $(EQCA\text{-}GWCA)_{i,t-1}$ is as-if accounted book equity reduced by book goodwill under the amortisation method of firm i, time t-1;$GWCA_{i,t-1}$is as-if accounted book goodwill under the amortisation method of firm i, time t-1. YEAR_2006, YEAR_2007, YEAR_2008, YEAR_2009 are dummy variables equal 1 if the year is 2006, 2007, 2008 and 2009 respectively and otherwise 0. YEAR_2005 is the benchmark year. $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, from period t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of equity-market value of firm i, time t. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\ \_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector. Goodwill-amortisation charges take positive values. Regression coefficients are unstandardised. t-statistics are given in parentheses. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). Observations with Cook's distance larger than 4/n where n is total number of observations are considered as outliers.

Table A24 – Excluding 2008 observations – hypothesis 2a

		Stock price t							
		Main model				*Main model with control variables*			
		Available sample		*Non-missing*		*Available sample*		*Non-missing*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*
Intercept		1.823***	1.643***	1.790***	1.594***	-10.397	-8.918**	-10.863	-8.898**
		(3.72)	(6.54)	(3.71)	(6.31)	(-1.47)	(-2.21)	(-1.55)	(-2.20)
$(E+GIM)_{i,t}$	+	3.191***	4.737***	3.247***	4.934***	2.653**	4.217***	2.693**	4.214***
		(3.08)	(8.18)	(3.07)	(8.22)	(2.55)	(7.38)	(2.54)	(7.37)
$GAM_{i,t}$		18.864***	11.816***	18.718***	11.882***	19.188***	12.671***	19.059***	12.662***
		(2.71)	(2.90)	(2.70)	(2.92)	(2.76)	(2.93)	(2.76)	(2.91)
$(EQCA\text{-}GWCA)_{i,t-1}$	+	0.906***	0.828***	0.929***	0.826***	0.831***	0.675***	0.853***	0.674***
		(2.75)	(7.09)	(2.86)	(6.99)	(2.69)	(5.76)	(2.77)	(5.74)
$GWCA_{i,t-1}$	+	0.932**	0.679**	0.941**	0.665**	0.649*	0.452	0.654*	0.451
		(2.23)	(2.24)	(2.24)	(2.17)	(1.74)	(1.51)	(1.75)	(1.50)
$GROWTH\_SALES_{i,t}$						0.398**	0.353***	0.395**	0.354***
						(2.18)	(4.22)	(2.16)	(4.23)
$lnSIZE\_MV_{i,t}$						0.709**	0.609***	0.728**	0.608
						(2.16)	(3.11)	(2.23)	(3.08)
$RESOURCES_{i,t}$						-1.795	-1.626	-1.613	-1.606
						(-0.70)	(-1.34)	(-0.63)	(-1.30)
$GENERAL\_$ $INDUSTRIALS_{i,t}$						-2.348**	-1.740**	-2.298*	-1.723**
						(-2.00)	(-2.15)	(-1.94)	(-2.06)
$CYCLICAL\_$ $CONSUMER\_GOODS_{i,t}$						-3.118**	-2.577***	-3.065**	-2.564**
						(-2.48)	(-2.62)	(-2.44)	(-2.54)
$NON\text{-}CYCLICAL\_$ $CONSUMER\_GOODS_{i,t}$						-0.182	-0.762	-0.175	-0.745
						(-0.11)	(-0.76)	(-0.11)	(-0.72)
$CYCLICAL\_SERVICES_{i,t}$						-3.031**	-2.462***	-2.991**	-2.445***
						(-2.48)	(-2.95)	(-2.41)	(-2.83)
$NON\_CYCLICAL\_$ $SERVICES_{i,t}$						-5.944***	-3.950***	-5.954***	-3.933***
						(-3.96)	(-3.88)	(-3.88)	(-3.73)
$UTILITIES_{i,t}$						-3.409**	-2.590**	-3.428**	-2.572**
						(-2.38)	(-2.55)	(-2.35)	(-2.45)
$INFORMATION\_$ $TECHNOLOGY_{i,t}$						-4.100***	-3.049***	-4.025***	-3.036***
						(-3.40)	(-3.60)	(-3.33)	(-3.48)
$FINANCE_{i,t}$						-2.780**	-2.193**	-2.734**	-2.164**
						(-2.31)	(-2.45)	(-2.23)	(-2.34)
N		620	574	615	569	620	582	615	578
F-value		18.42***	65.78***	19.19***	61.35***	11.92***	38.55***	12.15***	38.34***
Adjusted R^2		0.574	0.612	0.575	0.617	0.612	0.690	0.614	0.688
Max VIF		3.91	3.64	3.92	3.66	4.84	5.14	4.95	5.27
Mean VIF		2.66	2.48	2.65	2.47	2.51	2.56	2.52	2.59

Stock price of firm i, time t, is dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $GAM_{i,t}$ is as-if accounted goodwill-amortisation charges of firm i, period t; $(EQCA\text{-}GWCA)_{i,t-1}$ is as-if accounted book equity reduced by book goodwill under the amortisation method of firm i, time t-1;$GWCA_{i,t-1}$is as-if accounted book goodwill under the amortisation method of firm i, time t-1; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, from period t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of equity-market value of firm i, time t. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\ \_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector. Goodwill-amortisation charges take positive values. Regression coefficients are unstandardised. t-statistics are given in parentheses. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). Observations with Cook's distance larger than 4/n where n is total number of observations are considered as outliers.

Table A25 – Excluding large book goodwill - hypothesis 2a

		Stock price t							
		Main model				***Main model with control variables***			
		Available sample		*Non-missing*		*Available sample*		*Non-missing*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*
Intercept		2.498***	1.945***	2.480***	2.006***	-21.002**	-12.151***	-21.318***	-12.435***
		(6.24)	(6.55)	(6.17)	(6.84)	(-2.60)	(-2.79)	(-2.64)	(-2.84)
$(E+GIM)_{i,t}$	+	3.932***	4.683***	3.977***	4.651***	3.165***	3.986***	3.203***	4.078***
		(5.70)	(8.99)	(5.69)	(8.97)	(4.05)	(6.42)	(4.08)	(6.47)
$GAM_{i,t}$		23.627**	19.760***	23.252**	19.289***	22.337**	19.580***	21.999**	16.590***
		(2.29)	(3.05)	(2.27)	(2.94)	(2.22)	(3.24)	(2.20)	(2.67)
$(EQCA\text{-}GWCA)_{i,t-1}$	+	0.406*	0.640***	0.415*	0.612***	0.369*	0.509***	0.379*	0.555***
		(1.91)	(5.62)	(1.95)	(5.76)	(1.80)	(3.60)	(1.83)	(4.50)
$GWCA_{i,t-1}$	+	0.129	-0.223	0.137	-0.242	0.121	0.087	0.121	0.233
		(0.22)	(-0.49)	(0.24)	(-0.53)	(0.21)	(0.19)	(0.21)	(0.50)
$GROWTH\_SALES_{i,t}$						0.356	0.908*	0.354	0.956*
						(1.59)	(1.88)	(1.58)	(1.92)
$lnSIZE\_MV_{i,t}$						1.252***	0.753***	1.267***	0.761***
						(3.20)	(3.53)	(3.22)	(3.54)
$RESOURCES_{i,t}$						-3.447	-2.030	-3.385	-1.876
						(-1.27)	(-1.57)	(-1.24)	(-1.44)
$GENERAL\_INDUSTRIALS_{i,t}$						-2.464*	-1.615*	-2.446*	-1.547*
						(-1.85)	(-1.89)	(-1.80)	(-1.79)
$CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-3.589***	-2.348**	-3.577***	-2.271**
						(-2.74)	(-2.24)	(-2.69)	(-2.20)
$NON\text{-}CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-1.905	-1.175	-1.931	-1.147
						(-1.14)	(-1.16)	(-1.13)	(-1.12)
$CYCLICAL\_SERVICES_{i,t}$						-2.859**	-1.698*	-2.859**	-1.659*
						(-2.13)	(-1.90)	(-2.07)	(-1.83)
$NON\_CYCLICAL\_SERVICES_{i,t}$						-6.359***	-3.847***	-6.393***	-3.841***
						(-3.74)	(-3.47)	(-3.66)	(-3.42)
$UTILITIES_{i,t}$						-3.717**	-2.027*	-3.747**	-2.054*
						(-2.22)	(-1.68)	(-2.20)	(-1.71)
$INFORMATION\_TECHNOLOGY_{i,t}$						-4.025***	-2.870***	-3.999***	-2.769***
						(-3.34)	(-3.35)	(-3.26)	(-3.21)
$FINANCE_{i,t}$						-2.837**	-1.676*	-2.830**	-1.687*
						(-2.06)	(-1.90)	(-2.02)	(-1.90)
N		563	518	559	517	563	528	559	526
F-value		22.83***	45.51***	22.78***	52.81***	20.40***	22.16***	20.41***	25.31***
Adjusted R^2		0.536	0.571	0.535	0.591	0.583	0.641	0.582	0.658
Max VIF		4.42	4.44	4.44	4.79	4.56	4.56	4.58	4.27
Mean VIF		2.94	2.85	2.93	3.07	2.44	2.38	2.45	2.37

Stock price of firm i, time t, is dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $GAM_{i,t}$ is as-if accounted goodwill-amortisation charges of firm i, period t; $(EQCA\text{-}GWCA)_{i,t-1}$ is as-if accounted book equity reduced by book goodwill under the amortisation method of firm i, time t-1; $GWCA_{i,t-1}$ is as-if accounted book goodwill under the amortisation method of firm i, time t-1; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, from period t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of equity-market value of firm i, time t. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector. Goodwill-amortisation charges take positive values. Regression coefficients are unstandardised. t-statistics are given in parentheses. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). Observations with Cook's distance larger than 4/n where n is total number of observations are considered as outliers.

Table A26 – Stock prices measured with time lag t+2 months - hypothesis 2a

		Stock price t+2 months							
		Main model				*Main model with control variables*			
		Available sample		*Non-missing*		*Available sample*		*Non-missing*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*
Intercept		2.459***	1.876***	2.445***	1.862***	-16.164**	-12.672***	-16.492**	-12.673***
		(6.75)	(7.49)	(6.75)	(7.43)	(-2.28)	(-3.46)	(-2.33)	(-3.45)
$(E+GIM)_{i,t}$	+	3.264***	4.573***	3.297***	4.527***	2.524***	3.419***	2.549***	3.417***
		(4.03)	(9.15)	(4.01)	(9.94)	(3.08)	(7.23)	(3.08)	(7.23)
$GAM_{i,t}$		12.084**	6.904*	12.021**	7.507*	11.974**	9.773***	11.911**	9.803***
		(2.25)	(1.67)	(2.24)	(1.85)	(2.31)	(2.85)	(2.30)	(2.84)
$(EQCA\text{-}GWCA)_{i,t-1}$	+	0.592**	0.693***	0.601***	0.722***	0.522**	0.573***	0.532**	0.571***
		(2.56)	(6.18)	(2.61)	(6.49)	(2.34)	(6.32)	(2.38)	(6.30)
$GWCA_{i,t-1}$	+	0.656*	0.694**	0.657*	0.669**	0.430	0.296	0.428	0.293
		(1.64)	(2.30)	(1.64)	(2.25)	(1.21)	(1.28)	(1.20)	(1.26)
$GROWTH\_SALES_{i,t}$						0.579***	1.083**	0.573***	1.077**
						(2.94)	(2.61)	(2.92)	(2.58)
$lnSIZE\_MV_{i,t}$						1.052***	0.812***	1.067***	0.811***
						(3.14)	(4.52)	(3.18)	(4.50)
$RESOURCES_{i,t}$						-2.734	-1.459	-2.645	-1.434
						(-1.03)	(-1.13)	(-1.00)	(-1.10)
$GENERAL\_INDUSTRIALS_{i,t}$						-3.193**	-1.997**	-3.187**	-1.982**
						(-2.29)	(-2.36)	(-2.25)	(-2.28)
$CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-3.623**	-2.905***	-3.616**	-2.890***
						(-2.35)	(-2.87)	(-2.32)	(-2.81)
$NON\text{-}CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-1.336	-1.177	-1.358	-1.159
						(-0.78)	(-1.20)	(-0.78)	(-1.15)
$CYCLICAL\_SERVICES_{i,t}$						-3.794***	-2.624***	-3.792***	-2.608***
						(-2.68)	(-3.10)	(-2.62)	(-2.99)
$NON\_CYCLICAL\_SERVICES_{i,t}$						-7.728***	-5.151***	-7.768***	-5.134***
						(-4.32)	(-4.94)	(-4.24)	(-4.78)
$UTILITIES_{i,t}$						-4.420**	-2.607**	-4.455**	-2.589**
						(-2.47)	(-2.25)	(-2.45)	(-2.19)
$INFORMATION\_TECHNOLOGY_{i,t}$						-4.829***	-3.446***	-4.811***	-3.433***
						(-3.34)	(-3.76)	(-3.28)	(-3.66)
$FINANCE_{i,t}$						-3.281**	-2.107**	-3.262**	-2.072**
						(-2.34)	(-2.33)	(-2.28)	(-2.24)
N		767	710	762	709	767	715	762	711
F-value		23.22***	49.07***	23.73***	53.05***	11.51***	31.17***	11.71***	30.86***
Adjusted R^2		0.469	0.554	0.468	0.568	0.531	0.614	0.530	0.612
Max VIF		3.91	3.85	3.92	3.79	5.14	5.20	5.24	5.31
Mean VIF		2.64	2.53	2.63	2.50	2.59	2.52	2.61	2.55

Stock price of firm i, time t+2 months, is dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $GAM_{i,t}$ is as-if accounted goodwill-amortisation charges of firm i, period t; $(EQCA\text{-}GWCA)_{i,t-1}$ is as-if accounted book equity reduced by book goodwill under the amortisation method of firm i, time t-1; $GWCA_{i,t-1}$ is as-if accounted book goodwill under the amortisation method of firm i, time t-1; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, from period t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of equity-market value of firm i, time t. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\ \_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector. Goodwill-amortisation charges take positive values. Regression coefficients are unstandardised. t-statistics are given in parentheses. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). Observations with Cook's distance larger than 4/n where n is total number of observations are considered as outliers.

Table A27 – Stock price measured with time lag t+3 months - hypothesis 2a

		Stock price t+3 months							
		Main model				***Main model with control variables***			
		Available sample		*Non-missing*		*Available sample*		*Non-missing*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*
Intercept		2.455***	1.905***	2.444***	1.799***	-16.575**	-11.391***	-16.847**	-11.378***
		(7.11)	(7.58)	(7.10)	(7.71)	(-2.39)	(-3.13)	(-2.43)	(-3.12)
$(E+GIM)_{i,t}$	+	3.414***	4.684***	3.440***	4.791***	2.672***	3.881***	2.692***	3.878***
		(4.26)	(10.68)	(4.24)	(11.25)	(3.33)	(8.16)	(3.32)	(8.15)
$GAM_{i,t}$		10.828**	5.738	10.779**	5.890	10.494**	5.865*	10.450**	5.882*
		(2.11)	(1.48)	(2.10)	(1.53)	(2.12)	(1.67)	(2.12)	(1.67)
$(EQCA\text{-}GWCA)_{i,t-1}$	+	0.531**	0.654***	0.538**	0.725***	0.460**	0.524***	0.468**	0.523***
		(2.44)	(5.82)	(2.48)	(7.23)	(2.21)	(5.39)	(2.24)	(5.37)
$GWCA_{i,t-1}$	+	0.788**	0.804***	0.789**	0.810***	0.582*	0.593**	0.579*	0.592**
		(2.13)	(2.81)	(2.13)	(2.83)	(1.81)	(2.20)	(1.80)	(2.19)
$GROWTH\_SALES_{i,t}$						0.545***	0.590***	0.543***	0.590***
						(2.89)	(3.95)	(2.87)	(3.95)
$lnSIZE\_MV_{i,t}$						1.070***	0.746***	1.082***	0.744***
						(3.28)	(4.16)	(3.30)	(4.13)
$RESOURCES_{i,t}$						-2.690	-1.242	-2.602	-1.207
						(-1.00)	(-1.13)	(-0.97)	(-1.08)
$GENERAL\_INDUSTRIALS_{i,t}$						-3.126**	-1.898**	-3.109**	-1.871**
						(-2.23)	(-2.49)	(-2.18)	(-2.40)
$CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-3.547**	-2.784***	-3.531**	-2.759***
						(-2.30)	(-3.24)	(-2.27)	(-3.14)
$NON\text{-}CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-1.550	-1.237	-1.557	-1.207
						(-0.93)	(-1.41)	(-0.91)	(-1.34)
$CYCLICAL\_SERVICES_{i,t}$						-3.792***	-2.522***	-3.780***	-2.494***
						(-2.70)	(-3.33)	(-2.64)	(-3.20)
$NON\_CYCLICAL\_SERVICES_{i,t}$						-7.661***	-4.861***	-7.682***	-4.829***
						(-4.31)	(-5.00)	(-4.23)	(-4.84)
$UTILITIES_{i,t}$						-4.583***	-2.708**	-4.600**	-2.677**
						(-2.60)	(-2.50)	(-2.56)	(-2.43)
$INFORMATION\_TECHNOLOGY_{i,t}$						-4.633***	-3.084***	-4.609***	-3.060***
						(-3.19)	(-3.61)	(-3.12)	(-3.52)
$FINANCE_{i,t}$						-3.124**	-1.912**	-3.096**	-1.871**
						(-2.23)	(-2.35)	(-2.16)	(-2.24)
N		767	711	762	706	767	716	762	712
F-value		26.09***	58.19***	26.09***	75.20***	10.90***	41.94***	11.07***	41.54***
Adjusted R^2		0.477	0.569	0.475	0.566	0.536	0.614	0.534	0.612
Max VIF		3.91	3.76	3.92	3.77	5.14	5.17	5.24	5.28
Mean VIF		2.64	2.50	2.63	2.47	2.59	2.51	2.61	2.53

Stock price of firm i, time t+3 months, is dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $GAM_{i,t}$ is as-if accounted goodwill-amortisation charges of firm i, period t; $(EQCA\text{-}GWCA)_{i,t-1}$ is as-if accounted book equity reduced by book goodwill under the amortisation method of firm i, time t-1;$GWCA_{i,t-1}$is as-if accounted book goodwill under the amortisation method of firm i, time t-1; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, from period t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of equity-market value of firm i, time t. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\ \_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector. Goodwill-amortisation charges take positive values. Regression coefficients are unstandardised. t-statistics are given in parentheses. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). Observations with Cook's distance larger than 4/n where n is total number of observations are considered as outliers.

Table A28 – Stock price measured with time lag t+4 months - hypothesis 2a

		Stock price t+4 months							
		Main model				***Main model with control variables***			
		Available sample		*Non-missing*		*Available sample*		*Non-missing*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*
Intercept		2.483***	2.040***	2.468***	2.041***	-15.985**	-11.930***	-16.228**	-11.412***
		(7.70)	(8.58)	(7.69)	(8.57)	(-2.27)	(-3.08)	(-2.31)	(-2.96)
$(E+GIM)_{i,t}$	+	3.456***	4.712***	3.479***	4.697***	2.683***	3.706***	2.704***	3.725***
		(4.22)	(10.25)	(4.19)	(10.26)	(3.32)	(7.99)	(3.32)	(8.02)
$GAM_{i,t}$		12.653**	3.517	12.641**	3.504	12.509**	4.956*	12.514**	4.746*
		(2.33)	(1.12)	(2.33)	(1.11)	(2.36)	(1.80)	(2.36)	(1.71)
$(EQCA\text{-}GWCA)_{i,t-1}$	+	0.571***	0.695***	0.577***	0.690***	0.491**	0.627***	0.498**	0.626***
		(2.67)	(6.49)	(2.72)	(6.46)	(2.42)	(6.15)	(2.46)	(6.11)
$GWCA_{i,t-1}$	+	0.653*	0.842***	0.653*	0.847***	0.432	0.773**	0.429	0.787**
		(1.67)	(3.16)	(1.66)	(3.17)	(1.23)	(3.09)	(1.22)	(3.12)
$GROWTH\_SALES_{i,t}$						0.551***	0.882**	0.550***	0.919**
						(2.94)	(2.09)	(2.93)	(2.15)
$lnSIZE\_MV_{i,t}$						1.045***	0.767***	1.051***	0.737***
						(3.16)	(4.01)	(3.17)	(3.87)
$RESOURCES_{i,t}$						-2.272	-1.262	-2.097	-1.133
						(-0.85)	(-1.18)	(-0.78)	(-1.04)
$GENERAL\_INDUSTRIALS_{i,t}$						-3.133**	-1.766**	-3.040**	-1.657**
						(-2.10)	(-2.23)	(-2.00)	(-2.04)
$CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-3.626**	-2.743***	-3.531**	-2.640***
						(-2.22)	(-3.04)	(-2.14)	(-2.84)
$NON\text{-}CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-1.409	-1.182	-1.332	-1.033
						(-0.81)	(-1.28)	(-0.75)	(-1.09)
$CYCLICAL\_SERVICES_{i,t}$						-3.833***	-2.480***	-3.743**	-2.357***
						(-2.62)	(-3.14)	(-2.51)	(-2.91)
$NON\_CYCLICAL\_SERVICES_{i,t}$						-7.646***	-4.831***	-7.572***	-4.628***
						(-4.11)	(-4.77)	(-3.98)	(-4.48)
$UTILITIES_{i,t}$						-4.610**	-2.462**	-4.539**	-2.439**
						(-2.53)	(-2.21)	(-2.45)	(-2.16)
$INFORMATION\_TECHNOLOGY_{i,t}$						-4.727***	-3.187***	-4.626***	-3.071***
						(-3.13)	(-3.89)	(-3.13)	(-3.68)
$FINANCE_{i,t}$						-3.245**	-1.976**	-3.139**	-1.859**
						(-2.21)	(-2.37)	(-2.10)	(-2.18)
N		767	712	762	708	767	716	762	713
F-value		31.96***	62.62***	32.53***	63.02***	12.55***	39.71***	12.78***	38.77***
Adjusted R^2		0.484	0.578	0.482	0.577	0.543	0.627	0.541	0.623
Max VIF		3.91	3.81	3.92	3.83	5.14	5.22	5.24	5.33
Mean VIF		2.64	2.51	2.63	2.52	2.59	2.57	2.61	2.60

Stock price of firm i, time t+4 months, is dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $GAM_{i,t}$ is as-if accounted goodwill-amortisation charges of firm i, period t; $(EQCA\text{-}GWCA)_{i,t-1}$ is as-if accounted book equity reduced by book goodwill under the amortisation method of firm i, time t-1; $GWCA_{i,t-1}$ is as-if accounted book goodwill under the amortisation method of firm i, time t-1; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, from period t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of equity-market value of firm i, time t. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\ \_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector. Goodwill-amortisation charges take positive values. Regression coefficients are unstandardised. t-statistics are given in parentheses. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). Observations with Cook's distance larger than 4/n where n is total number of observations are considered as outliers.

Table A29 – Scaled by total assets t-1 – hypothesis 2a

		Market value scaled by total assets t-1							
		Main model				***Main model with control variables***			
		Available sample		*Non-missing*		*Available sample*		*Non-missing*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*
Intercept		0.442***	0.273***	0.440***	0.270***	-0.147	-0.640	-0.190	-0.682
		(3.13)	(3.88)	(3.10)	(3.81)	(-0.16)	(-0.96)	(-0.20)	(-1.03)
$(E+GIM)_{i,t}$	+	6.449***	7.428***	6.454***	7.442***	6.370***	7.354***	6.363***	7.351***
		(3.79)	(11.89)	(3.79)	(11.90)	(3.74)	(11.73)	(3.74)	(11.72)
$GAM_{i,t}$		15.740***	14.939***	15.717***	14.809***	16.195***	13.658***	16.186***	13.589***
		(3.65)	(5.84)	(3.62)	(5.67)	(3.55)	(6.18)	(3.52)	(6.08)
$(EQCA\text{-}GWCA)_{i,t-1}$	+	0.431	0.562***	0.439	0.575***	0.379	0.497**	0.382	0.504**
		(1.42)	(2.66)	(1.44)	(2.73)	(1.33)	(2.52)	(1.33)	(2.55)
$GWCA_{i,t-1}$	+	-0.253	0.081	-0.244	0.099	-0.357	-0.154	-0.354	-0.141
		(-0.52)	(0.28)	(-0.50)	(0.33)	(-0.79)	(-0.57)	(-0.78)	(-0.52)
$GROWTH\_SALES_{i,t}$						0.138**	0.250***	0.135**	0.247**
						(2.02)	(2.70)	(2.02)	(2.60)
$lnSIZE\_MV_{i,t}$						0.039	0.049	0.042	0.052
						(0.87)	(1.56)	(0.93)	(1.63)
$RESOURCES_{i,t}$						-0.603*	-0.589**	-0.596*	-0.576**
						(-1.89)	(-2.66)	(-1.84)	(-2.59)
$GENERAL\_INDUSTRIALS_{i,t}$						-0.015	0.023	-0.159	0.018
						(-0.85)	(0.20)	(-0.88)	(0.15)
$CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-0.451**	-0.162	-0.457**	-0.164
						(-2.25)	(-1.56)	(-2.25)	(-1.56)
$NON\text{-}CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-0.008	0.062	-0.018	0.055
						(-0.04)	(0.47)	(-0.09)	(0.41)
$CYCLICAL\_SERVICES_{i,t}$						-0.283	-0.121	-0.230	-0.124
						(-1.50)	(-1.10)	(-1.50)	(-1.11)
$NON\_CYCLICAL\_SERVICES_{i,t}$						-0.565**	-0.309**	-0.579**	-0.317**
						(-2.15)	(-2.24)	(-2.17)	(-2.26)
$UTILITIES_{i,t}$						-0.608***	-0.364***	-0.618***	-0.370**
						(-2.73)	(-2.60)	(-2.73)	(-2.59)
$INFORMATION\_TECHNOLOGY_{i,t}$						-0.371	-0.033	-0.377	-0.034
						(-1.46)	(-0.22)	(-1.47)	(-0.22)
$FINANCE_{i,t}$						-0.203	-0.248**	-0.209	-0.256**
						(-0.81)	(-2.20)	(-0.82)	(-2.21)
N		767	725	762	720	767	726	762	721
F-value		27.56***	50.53***	27.81***	50.59***	13.50***	22.20***	13.50***	27.42***
Adjusted R^2		0.343	0.431	0.427	0.433	0.440	0.516	0.440	0.517
Max VIF		4.31	2.40	4.33	2.42	5.25	5.52	5.35	5.63
Mean VIF		2.69	1.77	2.69	1.78	2.61	2.31	2.64	2.34

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Market value of firm i, time t, scaled by total assets at time t-1, is dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $GAM_{i,t}$ is as-if accounted goodwill-amortisation charges of firm i, period t; $(EQCA\text{-}GWCA)_{i,t-1}$ is as-if accounted book equity reduced by book goodwill under the amortisation method of firm i, time t-1; $GWCA_{i,t-1}$ is as-if accounted book goodwill under the amortisation method of firm i, time t-1; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, from period t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of equity-market value of firm i, time t. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\ \_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector. Goodwill-amortisation charges take positive values. Regression coefficients are unstandardised. All variables (both dependent and independent variables) except from control variables and industry-sector dummies are scaled by total asset of firm i, time t-1. t-statistics are given in parentheses. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). Observations with Cook's distance larger than 4/n where n is total number of observations are considered as outliers.

Table A30 – Scaled by total sales t – hypothesis 2a

		Market value scaled by total sales t							
		Main model				Main model with control variables			
		Available sample		Non-missing		Available sample		Non-missing	
Test variables	Pred.	Inclusive outliers	Exclusive outliers	Inclusive outliers	Exclusive outliers	Inclusive outliers	Exclusive outliers	Inclusive outliers	Exclusive outliers
Intercept		0.540***	0.437***	0.540***	0.437***	-0.776	-1.991**	-0.821	-2.036**
		(4.30)	(8.33)	(4.28)	(8.28)	(-0.52)	(-2.25)	(-0.55)	(-2.31)
$(E+GIM)_{i,t}$	+	3.229***	4.088***	3.230***	4.095***	3.025***	3.402***	3.022***	3.403***
		(6.90)	(10.73)	(6.90)	(10.74)	(6.90)	(9.92)	(6.90)	(9.93)
$GAM_{i,t}$		12.296***	11.817***	12.245***	11.537***	11.447***	11.571***	11.435***	11.428***
		(4.29)	(9.50)	(4.25)	(8.15)	(4.06)	(13.37)	(4.04)	(12.66)
$(EQCA\text{-}GWCA)_{i,t-1}$	+	0.860***	0.892***	0.860***	0.892***	0.746***	0.878***	0.746***	0.881***
		(5.99)	(13.74)	(6.00)	(13.71)	(4.96)	(15.35)	(4.94)	(15.23)
$GWCA_{i,t-1}$	+	0.576	0.507***	0.581	0.529***	0.466	0.412***	0.466	0.428***
		(1.47)	(2.77)	(1.47)	(2.79)	(1.26)	(2.76)	(1.25)	(2.79)
$GROWTH\_SALES_{i,t}$						0.144*	0.410***	0.143	0.410***
						(1.84)	(2.96)	(1.83)	(2.94)
$lnSIZE\_MV_{i,t}$						0.071	0.113***	0.073	0.115***
						(1.03)	(2.73)	(1.07)	(2.80)
$RESOURCES_{i,t}$						-0.241	-0.326	-0.227	-0.309
						(-0.55)	(-1.43)	(-0.51)	(-1.35)
$GENERAL\_INDUSTRIALS_{i,t}$						-0.190	0.090	-0.194	0.091
						(-0.61)	(0.66)	(-0.61)	(0.65)
$CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-0.556*	-0.280*	-0.560*	-0.277*
						(-1.76)	(-1.83)	(-1.73)	(-1.78)
$NON\text{-}CYCLICAL\_CONSUMER\_GOODS_{i,t}$						0.173	0.216	0.165	0.214
						(0.48)	(1.19)	(0.45)	(1.16)
$CYCLICAL\_SERVICES_{i,t}$						-0.318	-0.050	-0.322	-0.048
						(-1.01)	(-0.35)	(-1.00)	(-0.34)
$NON\_CYCLICAL\_SERVICES_{i,t}$						-1.155**	Omitted[39]	-1.166**	Omitted
						(-2.32)		(-2.32)	
$UTILITIES_{i,t}$						-0.464	0.005	-0.472	0.002
						(-1.15)	(0.02)	(-1.15)	(0.01)
$INFORMATION\_TECHNOLOGY_{i,t}$						0.239	0.225	0.237	0.230
						(0.53)	(0.92)	(0.52)	(0.93)
$FINANCE_{i,t}$						0.688	0.398**	0.684	0.384**
						(1.36)	(2.20)	(1.32)	(2.20)
N		767	714	762	709	767	714	762	709
F-value		19.07 ***	118.42***	18.96***	109.01***	17.74***	96.93***	18.07***	90.18***
Adjusted R^2		0.634	0.560	0.634	0.560	0.659	0.625	0.658	0.624
Max VIF		1.54	2.18	1.54	2.21	5.12	5.40	5.22	5.52
Mean VIF		1.30	1.60	1.30	1.62	2.24	2.38	2.27	2.41

Table continues on next page.

[39] No observations.

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Market value of firm i, time t, scaled by total sales period t, is dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $GAM_{i,t}$ is as-if accounted goodwill-amortisation charges of firm i, period t; $(EQCA\text{-}GWCA)_{i,t-1}$ is as-if accounted book equity reduced by book goodwill under the amortisation method of firm i, time t-1; $GWCA_{i,t-1}$ is as-if accounted book goodwill under the amortisation method of firm i, time t-1; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, from period t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of equity-market value of firm i, time t. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\ \_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector. Goodwill-amortisation charges take positive values. Regression coefficients are unstandardised. All variables (both dependent and independent variables) except from control variables and industry-sector dummies are scaled by total sales of firm i, period t. t-statistics are given in parentheses. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). Observations with Cook's distance larger than 4/n where n is total number of observations are considered as outliers.

Table A31 – Control for size – hypotheses 2a

		Unstandardised residuals t							
		Main model				***Main model with control variables***			
		Available sample		*Non-missing*		*Available sample*		*Non-missing*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*
Intercept		-2.907*** (-6.58)	-3.344*** (-11.27)	-2.927*** (-6.65)	-3.343*** (-11.20)	18.884*** (2.69)	23.141*** (5.91)	18.599*** (2.66)	22.870*** (5.82)
$(E+GIM)_{i,t}$	+	2.051** (2.49)	3.149*** (8.07)	2.092** (2.50)	3.146*** (8.06)	2.430** (2.60)	3.666*** (7.34)	2.452** (2.60)	3.671*** (7.33)
$GAM_{i,t}$		11.182** (2.11)	7.200** (2.43)	11.161** (2.11)	7.235** (2.43)	12.843** (2.46)	10.514*** (2.96)	12.791** (2.45)	10.472*** (2.94)
$(EQCA\text{-}GWCA)_{i,t-1}$	+	0.545** (2.26)	0.696*** (7.07)	0.557** (2.33)	0.695*** (7.04)	0.569** (2.61)	0.648*** (6.96)	0.577*** (2.64)	0.653*** (6.99)
$GWCA_{i,t-1}$	+	0.578* (1.69)	0.535** (2.29)	0.575* (1.67)	0.533** (2.27)	0.466 (1.42)	0.360 (1.51)	0.463 (1.41)	0.339 (1.43)
$GROWTH(SALES)_{i,t}$						0.446** (2.04)	0.549*** (3.31)	0.445** (2.03)	0.547*** (3.29)
$lnSIZE(MV)_{i,t}$						-0.894*** (-2.69)	-1.172*** (-6.18)	-0.881*** (-2.64)	-1.150*** (-6.04)
$RESOURCES_{i,t}$						-2.921 (-1.03)	-1.848 (-1.43)	-2.830 (-1.00)	-2.071 (-1.60)
$GENERAL\_INDUSTRIALS_{i,t}$						-2.878** (-2.15)	-1.740** (-2.11)	-2.859** (-2.09)	-1.894** (-2.32)
$CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-3.679*** (-2.69)	-2.867*** (-3.46)	-3.663*** (-2.65)	-3.036*** (-3.73)
$NON\text{-}CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-1.034 (-0.60)	-0.913 (-0.92)	-1.043 (-0.60)	-0.934 (-0.93)
$CYCLICAL\_SERVICES_{i,t}$						-3.553** (-2.58)	-2.322*** (-2.73)	-3.541** (-2.51)	-2.487*** (-2.93)
$NON\_CYCLICAL\_SERVICES_{i,t}$						-7.448*** (-4.19)	-4.711*** (-4.48)	-7.472*** (-4.11)	-4.952*** (-4.69)
$UTILITIES_{i,t}$						-4.345** (-2.53)	-2.321** (-2.01)	-4.366** (-2.49)	-2.531** (-2.20)
$INFORMATION\_TECHNOLOGY_{i,t}$						-4.653*** (-3.38)	-3.173*** (-3.71)	-4.629*** (-3.31)	-3.338*** (-3.91)
$FINANCE_{i,t}$						-3.013** (-2.19)	-1.929** (-2.17)	-2.985** (-2.12)	-2.084** (-2.35)
N		767	718	762	714	767	722	762	718
F-value		11.21***	50.89***	11.52***	50.38***	11.11***	104.59***	11.21***	105.79***
Adjusted R^2		0.344	0.384	0.346	0.382	0.413	0.544	0.414	0.542
Max VIF		3.91	3.69	3.92	3.69	5.14	5.34	5.24	5.60
Mean VIF		2.64	2.41	2.63	2.41	2.59	2.57	2.61	2.63

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The dependent variable is the unstandardised residuals from a regression of stock prices on size where size is measured as natural logarithm of equity-market value at the end of the fiscal year. $(E+GIM)_{i,t}$ is the pre-impairment net earnings of firm i, period t; $GAM_{i,t}$ is the as-if reported goodwill amortisation charge of firm i, period t; $(EQCA\text{-}GWCA)_{i,t-1}$ is the as-if calculated book value of equity reduced by book value of goodwill under the amortisation method of firm i, time t-1; $GWCA_{i,t-1}$ is the as-if calculated book value of goodwill under the amortisation method of firm i, time t-1; $GROWTH\_SALES_{i,t}$ is the relative growth in total sales of firm i,from period t-1 to t; $lnSIZE\_MV_{i,t}$ is the natural logarithm of the market value of firm i, time t. $RESOURCES_{i,t}$,$GENERAL\_INDUSTRIALS_{i,t}$,$CYCLICAL\_CONSUMER\_GOODS_{i,t}$,$NON\_CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES,$UTILITIES_{i,t}$, $INFORMATION\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry dummy variables equals the value of 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark industry. Goodwill amortisation charges have positive numbers in these regressions. All variables except stock price, control variables and industry dummies are scaled by number of outstanding shares. Regression coefficients are unstandardized. t-statistics are given in parentheses. *indicates significant at 10% level (two-tailed),**indicates significant at 5 % level (two-tailed),*** indicates significant at 1% level (two-tailed). Observations having a value of Cook's distance larger than 4/n where n is total number of observations are classified as outliers.

Table A32 – Including year dummies – hypothesis 2b

		Stock return t			
		Main model		***Main model, year-dummies and control variables***	
		Available sample / Non-missing sample		*Available sample / Non-missing sample*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*
Intercept		0.169 ***	0.169 ***	-0.537**	-0.506***
		(4.63)	(6.32)	(-2.04)	(-2.94)
$(E+GIM)_{i,t}$	+	1.642***	1.447***	1.316***	1.219***
		(4.00)	(8.26)	(3.39)	(6.14)
$\Delta(E+GIM)_{i,t,t-1}$	+	-0.351	-0.251**	-0.249	-0.192
		(-1.55)	(-2.15)	(-1.12)	(-1.61)
$GAM_{i,t}$		1.919***	0.633	2.153***	1.147**
		(5.03)	(1.34)	(6.10)	(2.17)
$\Delta GAM_{i,t,t-1}$		2.277	2.767***	2.134*	2.063**
		(1.54)	(3.02)	(1.64)	(2.25)
YEAR_2006		-0.107***	-0.074***	-0.126***	-0.080***
		(-3.21)	(-2.65)	(-3.78)	(-2.96)
YEAR_2007		-0.375***	-0.356***	-0.400***	-0.371***
		(-11.16)	(-12.36)	(-11.71)	(-13.02)
YEAR_2008		-0.630***	-0.605***	-0.642***	-0.604***
		(-13.75)	(-18.55)	(-14.41)	(-19.10)
YEAR_2009		0 .102*	0.035	0.080	0.052
		(1.95)	(0.92)	(1.48)	(1.36)
$GROWTH\_SALES_{i,t}$				0.026	0.058
				(1.16)	(1.17)
$lnSIZE\_MV_{i,t}$				0.038***	0.037***
				(2.97)	(4.50)
$LEVERAGE_{i,t-1}$				$5.11*10^{-5}$**	$-1.73*10^{-5}$
				(2.32)	(-0.34)
$RESOURCES_{i,t}$				0.147*	0.025
				(1.66)	(0.41)
$GENERAL\_INDUSTRIALS_{i,t}$				-0.033	-0.051*
				(-0.84)	(-1.65)
$CYCLICAL\_CONSUMER\_GOODS_{i,t}$				-0.188***	-0.186***
				(-3.91)	(-4.11)
$NON\text{-}CYCLICAL\_CONSUMER\_GOODS_{i,t}$				-0.141***	-0.153***
				(-3.34)	(-4.36)
$CYCLICAL\_SERVICES_{i,t}$				-0.114***	-0.138***
				(-2.93)	(-4.24)
$NON\_CYCLICAL\_SERVICES_{i,t}$				-0.380***	-0.369***
				(-4.45)	(-9.17)
$UTILITIES_{i,t}$				-0.139***	-0.140***
				(-2.70)	(-3.42)
$INFORMATION\_TECHNOLOGY_{i,t}$				-0.011	-0.113***
				(-0.15)	(-2.83)
$FINANCE_{i,t}$				-0.019	-0.079**
				(-0.41)	(-2.02)
N		762	727	762	716
F-value		48.15***	84.41***	35.99***	38.66***
Adjusted R^2		0.402	0.492	0.421	0.517
Max VIF		1.62	1.70	5.26	5.17
Mean VIF		1.44	1.48	2.04	2.03

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Stock return of firm i, period t, is dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $\Delta\ (E+GIM)_{i,t,t-1}$ is changes in pre-impairment net earnings of firm i from period t-1 to t; $GAM_{i,t}$ is as-if accounted goodwill-amortisation charge of firm i, period t; $\Delta GAM_{i,t,t-1}$ is changes in as-if accounted goodwill-amortisation charge of firm i from period t-1 to t; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, from period t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of the equity-market value of firm i, time t; $LEVERAGE_{i,t-1}$ is debt-to-equity ratio of firm i, time t-1. YEAR_2006, YEAR_2007, YEAR_2008, YEAR_2009 are dummy variables equal 1 if the year is 2006, 2007, 2008 and 2009 respectively and otherwise 0. YEAR_2005 is the benchmark year. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector. Goodwill-amortisation charges take positive values. Regression coefficients are unstandardised. t-statistics are given in parentheses. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). Observations with Cook's distance larger than 4/n where n is total number of observations are considered as outliers.

Table A33 – Excluding 2008 observations – hypothesis 2b

		Stock return t			
		Main model		Main model with control variables	
		Available sample / Non-missing sample		Available sample / Non-missing sample	
Test variables	Pred.	Inclusive outliers	Exclusive outliers	Inclusive outliers	Exclusive outliers
Intercept		0.016 (0.40)	0.016 (0.63)	-0.033 (-0.10)	0.026 (0.11)
$(E+GIM)_{i,t}$	+	2.043*** (3.87)	1.860*** (7.74)	1.659*** (3.18)	1.511*** (5.64)
$\Delta(E+GIM)_{i,t,t-1}$	+	-0.408 (-1.45)	-0.482*** (-3.15)	-0.276 (-0.99)	-0.259 (-1.60)
$GAM_{i,t}$		2.941*** (4.99)	2.227*** (3.32)	3.151*** (5.26)	2.985*** (3.86)
$\Delta GAM_{i,t,t-1}$		1.415 (1.08)	0.880 (0.84)	1.321 (1.12)	0.634 (0.56)
$GROWTH\_SALES_{i,t}$				-0.005 (-0.17)	-0.023 (-0.40)
$lnSIZE\_MV_{i,t}$				0.008 (0.54)	0.007 (0.61)
$LEVERAGE_{i,t-1}$				$1.02*10^{-4}$*** (4.07)	$-4.52*10^{-4}$ (-0.70)
$RESOURCES_{i,t}$				0.216* (1.87)	0.068 (1.02)
$GENERAL\_ INDUSTRIALS_{i,t}$				-0.118*** (-2.74)	-0.131*** (-3.44)
$CYCLICAL\_ CONSUMER\_ GOODS_{i,t}$				-0.230*** (-3.01)	-0.164*** (-2.74)
$NON\text{-}CYCLICAL\_ CONSUMER\_GOODS_{i,t}$				-0.157*** (-3.26)	-0.159*** (-3.75)
$CYCLICAL\_SERVICES_{i,t}$				-0.147*** (-3.61)	-0.170*** (-4.26)
$NON\_CYCLICAL\_ SERVICES_{i,t}$				-0.242** (-2.48)	-0.209*** (-4.01)
$UTILITIES_{i,t}$				-0.150*** (-2.76)	-0.144*** (-2.73)
$INFORMATION\_ TECHNOLOGY_{i,t}$				-0.064 (-0.79)	-0.148** (-2.20)
$FINANCE_{i,t}$				-0.084 (-1.57)	-0.128** (-2.51)
N		615	588	615	582
F-value		10.18***	17.85***	8.26***	6.06***
Adjusted R^2		0.178	0.096	0.197	0.107
Max VIF		1.46	1.44	4.87	4.75
Mean VIF		1.23	1.22	2.00	1.96

Stock return of firm i, period t, is dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $\Delta(E+GIM)_{i,t,t-1}$ is changes in pre-impairment net earnings of firm i from period t-1 to t; $GAM_{i,t}$ is as-if accounted goodwill-amortisation charge of firm i, period t; $\Delta GAM_{i,t,t-1}$ is changes in as-if accounted goodwill-amortisation charge of firm i from period t-1 to t; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, from period t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of the equity-market value of firm i, time t; $LEVERAGE_{i,t-1}$ is debt-to-equity ratio of firm i, time t-1. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector. Goodwill-amortisation charges take positive values. Regression coefficients are unstandardised. t-statistics are given in parentheses. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). Observations with Cook's distance larger than 4/n where n is total number of observations are considered as outliers.

Table A34 – Excluding large goodwill – hypothesis 2b

		Stock return t			
		Main model		*Main model with control variables*	
		Available sample / Non-missing sample		*Available sample / Non-missing sample*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*
Intercept		-0.064 (-1.23)	-0.052** (-2.15)	-1.330*** (-3.45)	-1.042*** (-3.53)
$(E+GIM)_{i,t}$	+	1.664*** (3.11)	1.503*** (6.78)	1.242** (2.51)	0.959*** (3.64)
$\Delta(E+GIM)_{i,t,t-1}$	+	0.024 (0.08)	0.511*** (2.74)	0.182 (0.65)	0.740*** (3.23)
$GAM_{i,t}$		5.314** (2.09)	3.096** (2.29)	6.708** (2.47)	4.617*** (2.72)
$\Delta GAM_{i,t,t-1}$		0.197 (0.35)	-0.637 (-0.44)	0.135 (0.19)	-0.974 (-0.74)
$GROWTH\_SALES_{i,t}$				0.023 (0.85)	-0.018 (-0.24)
$lnSIZE\_MV_{i,t}$				0.067*** (3.75)	0.056*** (4.00)
$LEVERAGE_{i,t-1}$				$1.05*10^{-4}$** (2.59)	-0.001* (-1.88)
$RESOURCES_{i,t}$				0.008 (0.08)	-0.078 (-1.06)
$GENERAL\_INDUSTRIALS_{i,t}$				-0.198*** (-4.30)	-0.195*** (-4.93)
$CYCLICAL\_CONSUMER\_GOODS_{i,t}$				-0.185*** (-2.85)	-0.123** (-2.55)
$NON\text{-}CYCLICAL\_CONSUMER\_GOODS_{i,t}$				-0.282*** (-5.48)	-0.280*** (-6.16)
$CYCLICAL\_SERVICES_{i,t}$				-0.149*** (-3.38)	-0.176*** (-4.17)
$NON\_CYCLICAL\_SERVICES_{i,t}$				-0.221*** (-2.75)	-0.221*** (-3.29)
$UTILITIES_{i,t}$				-0.217*** (-3.72)	-0.213*** (-4.17)
$INFORMATION\_TECHNOLOGY_{i,t}$				-0.124** (-2.14)	-0.283*** (-3.32)
$FINANCE_{i,t}$				-0.115** (-2.38)	-0.109*** (-2.63)
N		559	525	559	532
F-value		4.41***	29.80***	5.70***	8.81***
Adjusted R^2		0.122	0.124	0.154	0.158
Max VIF		1.57	1.61	4.10	4.00
Mean VIF		1.28	1.32	1.89	1.85

Stock return of firm i, period t, is dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $\Delta(E+GIM)_{i,t,t-1}$ is changes in pre-impairment net earnings of firm i from period t-1 to t; $GAM_{i,t}$ is as-if accounted goodwill-amortisation charge of firm i, period t; $\Delta GAM_{i,t,t-1}$ is changes in as-if accounted goodwill-amortisation charge of firm i from period t-1 to t; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, from period t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of the equity-market value of firm i, time t; $LEVERAGE_{i,t-1}$ is debt-to-equity ratio of firm i, time t-1. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector. Goodwill-amortisation charges take positive values. Regression coefficients are unstandardised. t-statistics are given in parentheses. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). Observations with Cook's distance larger than 4/n where n is total number of observations are considered as outliers.

Table A35 – Stock return measured with time lag t+2 months – hypothesis 2b

		Stock return t+2 months							
		Main model				***Main model with control variables***			
		Available sample		*Non-missing*		*Available sample*		*Non-missing*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*
Intercept		-0.014	-0.017	-0.014	-0.018	-0.751***	-0.762***	-0.748***	-0.785***
		(-0.47)	(-0.79)	(-0.49)	(-0.83)	(-2.65)	(-3.16)	(-2.64)	(-3.23)
$(E+GIM)_{i,t}$	+	1.067***	1.193***	1.076***	1.209***	0.771**	0.645**	0.780**	0.673**
		(2.90)	(5.10)	(2.92)	(5.16)	(2.14)	(2.60)	(2.16)	(2.71)
$\Delta(E+GIM)_{i,t,t-1}$	+	0.094	0.280*	0.089	0.266	0.192	0.342**	0.187	0.340**
		(0.31)	(1.68)	(0.29)	(1.60)	(0.63)	(2.15)	(0.61)	(2.14)
$GAM_{i,t}$		3.231***	2.533***	3.210***	2.484***	3.613***	3.080***	3.588***	3.016***
		(3.29)	(3.81)	(3.27)	(3.73)	(3.56)	(4.47)	(3.54)	(4.37)
$\Delta GAM_{i,t,t-1}$		-6.994***	-11.689***	-7.003***	-11.707***	-7.259***	-9.928***	-7.274***	-10.052***
		(-4.07)	(-5.08)	(-4.09)	(-5.07)	(-4.27)	(-5.13)	(-4.30)	(-5.11)
$GROWTH\_SALES_{i,t}$						0.040	-0.027	0.040	-0.024
						(1.52)	(-0.44)	(1.54)	(-0.38)
$lnSIZE\_MV_{i,t}$						0.041***	0.043***	0.041***	0.043***
						(3.09)	(3.80)	(3.09)	(3.81)
$LEVERAGE_{i,t-1}$						$2.16*10^{-4}$***	-0.001	$2.16*10^{-4}$***	-0.001
						(4.60)	(-1.54)	(4.64)	(-1.51)
$RESOURCES_{i,t}$						0.065	0.073	0.064	0.089
						(0.75)	(0.75)	(0.74)	(0.88)
$GENERAL\_INDUSTRIALS_{i,t}$						-0.127***	-0.126***	-0.127***	-0.107**
						(-2.97)	(-2.81)	(-2.97)	(-1.99)
$CYCLICAL\_CONSUMER\_GOODS_{i,t}$						- 0.006	-0.052	-0.006	-0.033
						(-0.16)	(-0.67)	(-0.16)	(-0.38)
$NON\text{-}CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-0.208***	-0.201***	-0.208***	-0.182***
						(-4.64)	(-4.10)	(-4.64)	(-3.22)
$CYCLICAL\_SERVICES_{i,t}$						-0.151***	-0.169***	-0.151***	-0.150***
						(-3.58)	(-3.64)	(-3.58)	(-2.75)
$NON\_CYCLICAL\_SERVICES_{i,t}$						-0.434**	-0.287***	-0.433**	-0.270***
						(-2.17)	(-5.16)	(-2.17)	(-4.35)
$UTILITIES_{i,t}$						-0.211***	-0.207***	-0.211***	-0.189***
						(-3.60)	(-3.72)	(-3.61)	(-3.04)
$INFORMATION\_TECHNOLOGY_{i,t}$						-0.099	-0.199***	-0.099	-0.178**
						(-1.04)	(-3.02)	(-1.03)	(-2.49)
$FINANCE_{i,t}$						-0.120**	-0.141**	-0.125**	-0.128**
						(-2.37)	(-2.54)	(-2.40)	(-2.02)
N		763	715	762	714	763	719	762	719
F-value		9.40***	28.76***	9.42***	28.60***	7.97***	8.05***	8.06***	8.04***
Adjusted R^2		0.103	0.127	0.103	0.128	0.122	0.149	0.122	0.151
Max VIF		1.51	1.52	1.52	1.52	5.23	5.35	5.23	5.22
Mean VIF		1.28	1.28	1.28	1.29	2.10	2.11	2.10	2.08

Stock return of firm i, period t+2 months, is dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $\Delta(E+GIM)_{i,t,t-1}$ is changes in pre-impairment net earnings of firm i from period t-1 to t; $GAM_{i,t}$ is as-if accounted goodwill-amortisation charge of firm i, period t; $\Delta GAM_{i,t,t-1}$ is changes in as-if accounted goodwill-amortisation charge of firm i from period t-1 to t; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, from period t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of the equity-market value of firm i, time t; $LEVERAGE_{i,t-1}$ is debt-to-equity ratio of firm i, time t-1. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector. Goodwill-amortisation charges take positive values. Regression coefficients are unstandardised. t-statistics are given in parentheses. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). Observations with Cook's distance larger than 4/n where n is total number of observations are considered as outliers.

Table A36 – Stock return measured with time lag t+3 months – hypothesis 2b

		Stock return t+3 months							
		Main model				*Main model with control variables*			
		Available sample		*Non-missing*		*Available sample*		*Non-missing*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*
Intercept		0.023	0.005	0.021	0.003	-0.874***	-0.879***	-0.870***	-0.875***
		(0.62)	(0.22)	(0.58)	(0.15)	(-3.20)	(-3.63)	(-3.19)	(-3.63)
$(E+GIM)_{i,t}$	+	0.813**	1.058***	0.825**	1.081***	0.546	0.711***	0.557	0.730***
		(2.38)	(4.74)	(2.41)	(4.85)	(1.60)	(2.79)	(1.64)	(2.87)
$\Delta(E+GIM)_{i,t,t-1}$	+	0.244	0.224	0.239	0.206	0.327	0.421**	0.322	0.405**
		(0.81)	(1.50)	(0.80)	(1.40)	(1.07)	(2.44)	(1.06)	(2.35)
$GAM_{i,t}$		2.031	0.885	2.005	0.816	2.269*	1.567	2.237	1.489*
		(1.47)	(1.38)	(1.46)	(1.28)	(1.65)	(1.94)	(1.63)	(1.88)
$\Delta GAM_{i,t,t-1}$		-1.197	-7.131***	-1.233	-7.314***	-1.429	-7.828***	-1.479	-8.002***
		(-0.74)	(-2.79)	(-0.76)	(-2.83)	(-0.85)	(-3.58)	(-0.89)	(-3.60)
$GROWTH\_SALES_{i,t}$						$2.74*10^{-4}$	-0.012	$7.78*10^{-4}$	-0.008
						(0.01)	(-0.18)	(0.02)	(-0.12)
$lnSIZE\_MV_{i,t}$						0.049***	0.049***	0.049***	0.049***
						(3.72)	(4.24)	(3.71)	(4.23)
$LEVERAGE_{i,t-1}$						$2.55*10^{-4}$***	-0.001*	$2.55*10^{-4}$***	-0.001*
						(5.14)	(-1.93)	(5.22)	(-1.86)
$RESOURCES_{i,t}$						0.008	0.012	0.008	0.010
						(0.10)	(0.13)	(0.09)	(0.11)
$GENERAL\_INDUSTRIALS_{i,t}$						-0.137***	-0.127***	-0.137***	-0.126***
						(-3.02)	(-2.75)	(-3.02)	(-2.74)
$CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-0.017	-0.011	-0.017	-0.010
						(-0.33)	(-0.13)	(-0.32)	(-0.13)
$NON\text{-}CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-0.253***	-0.226***	-0.253***	-0.225***
						(-4.96)	(-4.48)	(-4.96)	(-4.47)
$CYCLICAL\_SERVICES_{i,t}$						-0.160***	-0.159***	-0.160***	-0.158***
						(-3.60)	(-3.43)	(-3.59)	(-3.41)
$NON\_CYCLICAL\_SERVICES_{i,t}$						-0.384***	-0.330***	-0.384***	-0.331***
						(-2.72)	(-5.91)	(-2.72)	(-5.92)
$UTILITIES_{i,t}$						-0.252***	-0.229***	-0.251***	-0.229***
						(-4.29)	(-3.98)	(-4.30)	(-3.99)
$INFORMATION\_TECHNOLOGY_{i,t}$						-0.048	-0.129	-0.047	-0.126
						(-0.51)	(-1.59)	(-0.50)	(-1.56)
$FINANCE_{i,t}$						-0.125**	-0.108**	-0.134***	-0.118***
						(-2.52)	(-2.05)	(-2.70)	(-2.26)
N		763	730	762	729	763	726	762	725
F-value		3.34**	13.93***	3.39**	13.92***	6.60***	6.93***	6.70***	6.80***
Adjusted R^2		0.062	0.063	0.063	0.065	0.081	0.117	0.081	0.118
Max VIF		1.56	1.52	1.57	1.52	5.22	5.35	5.22	5.34
Mean VIF		1.29	1.28	1.29	1.28	2.10	2.13	2.09	2.13

Stock return of firm i, period t+3 months, is dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $\Delta(E+GIM)_{i,t,t-1}$ is changes in pre-impairment net earnings of firm i from period t-1 to t; $GAM_{i,t}$ is as-if accounted goodwill-amortisation charge of firm i, period t; $\Delta GAM_{i,t,t-1}$ is changes in as-if accounted goodwill-amortisation charge of firm i from period t-1 to t; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, from period t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of the equity-market value of firm i, time t; $LEVERAGE_{i,t-1}$ is debt-to-equity ratio of firm i, time t-1. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector. Goodwill-amortisation charges take positive values. Regression coefficients are unstandardised. t-statistics are given in parentheses. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). Observations with Cook's distance larger than 4/n where n is total number of observations are considered as outliers.

Table A37 – Stock return measured with time lag t+4 months – hypothesis 2b

		Stock return t+4 months							
		Main model				***Main model with control variables***			
		Available sample		*Non-missing*		*Available sample*		*Non-missing*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*
Intercept		0.052*	0.038*	0.051*	0.036*	-0.666***	-0.872***	-0.663***	-0.870***
		(1.70)	(1.79)	(1.67)	(1.72)	(-2.86)	(-3.94)	(-2.85)	(-3.95)
$(E+GIM)_{i,t}$	+	0.717**	0.842***	0.727**	0.862***	0.504*	0.565**	0.514*	0.583**
		(2.42)	(3.81)	(2.45)	(3.88)	(1.76)	(2.51)	(1.79)	(2.60)
$\Delta(E+GIM)_{i,t,t-1}$	+	0.033	0.410**	0.027	0.394**	0.097	0.343***	0.090	0.328***
		(0.15)	(2.46)	(0.12)	(2.37)	(0.44)	(2.81)	(0.41)	(2.70)
$GAM_{i,t}$		0.774	-0.088	0.753	-0.136	0.934	0.728 (1.04)	0.908	0.671
		(0.66)	(-0.13)	(0.64)	(-0.20)	(0.82)		(0.80)	(0.98)
$\Delta GAM_{i,t,t-1}$		-0.748	-5.536**	-0.771	-5.661**	-0.950	-6.942***	-0.982	-7.064***
		(-0.74)	(-2.50)	(-0.76)	(-2.54)	(-0.92)	(-3.64)	(-0.95)	(-3.66)
$GROWTH\_SALES_{i,t}$						0.021	-0.005	0.022	-0.002
						(0.95)	(-0.07)	(0.97)	(-0.03)
$lnSIZE\_MV_{i,t}$						0.040***	0.049***	0.040***	0.049***
						(3.57)	(4.56)	(3.57)	(4.56)
$LEVERAGE_{i,t-1}$						$1.66*10^{-4}$**	-0.001**	$1.67*10^{-4}$**	-0.001**
						(4.47)	(-2.18)	(4.55)	(-2.12)
$RESOURCES_{i,t}$						0.012	0.034	0.011	0.032
						(0.15)	(0.39)	(0.14)	(0.37)
$GENERAL\_INDUSTRIALS_{i,t}$						-0.132**	-0.107**	-0.131**	-0.107**
						(-2.43)	(-2.08)	(-2.43)	(-2.07)
$CYCLICAL\_CONSUMER\_GOODS_{i,t}$						0.063	0.091	0.063	0.091
						(1.03)	(1.24)	(1.04)	(1.25)
$NON\text{-}CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-0.236***	-0.215***	-0.235***	-0.214***
						(-4.14)	(-3.83)	(-4.14)	(-3.82)
$CYCLICAL\_SERVICES_{i,t}$						-0.144***	-0.134***	-0.143***	-0.134***
						(-2.87)	(-2.65)	(-2.86)	(-2.64)
$NON\_CYCLICAL\_SERVICES_{i,t}$						-0.317**	-0.309***	-0.317**	-0.309***
						(-2.37)	(-5.00)	(-2.37)	(-5.00)
$UTILITIES_{i,t}$						-0.217***	-0.199***	-0.217***	-0.199***
						(-3.62)	(-3.29)	(-3.62)	(-3.30)
$INFORMATION\_TECHNOLOGY_{i,t}$						0.011	-0.031	0.012	-0.029
						(0.13)	(-0.39)	(0.14)	(-0.37)
$FINANCE_{i,t}$						-0.116**	-0.102*	-0.123**	-0.111*
						(-2.06)	(-1.79)	(-2.20)	(-1.96)
N		763	728	762	727	763	720	762	719
F-value		3.09**	12.67***	3.11**	12.72***	7.15***	8.22***	7.25***	8.13***
Adjusted R^2		0.022	0.058	0.023	0.059	0.045	0.100	0.045	0.101
Max VIF		1.54	1.55	1.54	1.55	5.23	5.59	5.22	5.59
Mean VIF		1.28	1.29	1.28	1.29	2.09	2.19	2.09	2.19

Stock return of firm i, period t+4 months, is dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $\Delta(E+GIM)_{i,t,t-1}$ is changes in pre-impairment net earnings of firm i from period t-1 to t; $GAM_{i,t}$ is as-if accounted goodwill-amortisation charge of firm i, period t; $\Delta GAM_{i,t,t-1}$ is changes in as-if accounted goodwill-amortisation charge of firm i from period t-1 to t; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, from period t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of the equity-market value of firm i, time t; $LEVERAGE_{i,t-1}$ is debt-to-equity ratio of firm i, time t-1. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector. Goodwill-amortisation charges take positive values. Regression coefficients are unstandardised. t-statistics are given in parentheses. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). Observations with Cook's distance larger than 4/n where n is total number of observations are considered as outliers.

Table A38 – Control for size – hypothesis 2b

		Unstandardised residuals t			
		Main model		***Main model with control variables***	
		Available sample / Non-missing sample		*Available sample / Non-missing sample*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*
Intercept		-0.186*** (-5.44)	-0.205*** (-9.53)	-0.376 (-1.17)	-0.181 (-0.70)
$(E+GIM)_{i,t}$	+	1.568*** (3.45)	1.557*** (6.45)	1.358*** (3.08)	1.202*** (5.00)
$\Delta(E+GIM)_{i,t,t-1}$	+	0.055 (0.22)	0.448** (2.57)	0.130 (0.52)	0.447*** (2.66)
$GAM_{i,t}$		2.681*** (5.16)	2.369*** (6.84)	2.817*** (5.61)	2.559*** (7.81)
$\Delta GAM_{i,t,t-1}$		0.393 (0.31)	-2.699 (-1.59)	0.282 (0.23)	-0.465 (-0.58)
$GROWTH\_SALES_{i,t}$				0.010 (0.32)	-0.029 (-0.49)
$lnSIZE\_MV_{i,t}$				0.017 (1.08)	0.009 (0.70)
$LEVERAGE_{i,t-1}$				$1.15*10^{-4}$*** (3.29)	$-9.26*10^{-4}$ (-1.25)
$RESOURCES_{i,t}$				0.014 (0.15)	-0.054 (-0.59)
$GENERAL\_INDUSTRIALS_{i,t}$				-0.167*** (-4.37)	-0.186*** (-5.49)
$CYCLICAL\_CONSUMER\_GOODS_{i,t}$				-0.151*** (-2.69)	-0.109** (-2.44)
$NON\text{-}CYCLICAL\_CONSUMER\_GOODS_{i,t}$				-0.233*** (-5.37)	-0.230*** (-5.74)
$CYCLICAL\_SERVICES_{i,t}$				-0.175*** (-4.69)	-0.189*** (-5.13)
$NON\_CYCLICAL\_SERVICES_{i,t}$				-0.342*** (-2.81)	-0.271*** (-5.42)
$UTILITIES_{i,t}$				-0.255*** (-4.15)	-0.228*** (-4.44)
$INFORMATION\_TECHNOLOGY_{i,t}$				-0.097 (-1.27)	-0.178*** (-3.05)
$FINANCE_{i,t}$				-0.101** (-2.31)	-0.137*** (-3.25)
N		762	727	762	727
F-value		11.89***	37.76***	12.07***	12.52***
Adjusted R^2		0.121	0.152	0.128	0.146
Max VIF		1.53	1.47	5.20	5.07
Mean VIF		1.27	1.24	2.09	2.04

The dependent variable is the unstandardised residuals from a regression of stock return on size where size is measured as natural logarithm of equity-market value at the end of the fiscal year. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $\Delta(E+GIM)_{i,t,t-1}$ is changes in pre-impairment net earnings of firm i from period t-1 to t; $GAM_{i,t}$ is as-if accounted goodwill-amortisation charge of firm i, period t; $\Delta GAM_{i,t,t-1}$ is changes in as-if accounted goodwill-amortisation charge of firm i from period t-1 to t; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, from period t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of the equity-market value of firm i, time t; $LEVERAGE_{i,t-1}$ is debt-to-equity ratio of firm i, time t-1. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector. Goodwill-amortisation charges take positive values. Regression coefficients are unstandardised. t-statistics are given in parentheses. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). Observations with Cook's distance larger than 4/n where n is total number of observations are considered as outliers.

Table A39 – Including year dummies – hypothesis 2c

		Stock price t							
		Main model				***Main model, year-dummies and control variables***			
		Available sample		*Non-missing*		*Available sample*		*Non-missing*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*
Intercept		2.627***	2.026***	2.649***	2.027***	-13.724**	-9.025**	-13.989**	-9.307**
		(7.04)	(8.32)	(6.86)	(8.26)	(-2.00)	(-2.31)	(-2.04)	(-2.38)
$(E+GIM)_{i,t}$	+	2.981***	4.256***	3.017***	4.249***	2.373***	3.958***	2.401***	3.982***
		(3.57)	(7.83)	(3.57)	(7.83)	(2.78)	(6.71)	(2.79)	(6.74)
$GAMC_{i,t}$		15.165***	8.310**	15.090***	8.240**	15.325***	13.978***	15.273***	13.928***
		(2.79)	(2.03)	(2.79)	(2.00)	(2.85)	(3.63)	(2.85)	(3.61)
$GIMC_{i,t}$	-	-3.860*	-2.795** (-	-3.894*	-2.799**	-3.176	-1.593*	-3.217	-1.578*
		(-1.76)	2.59)	(-1.76)	(-2.59)	(-1.54)	(-1.67)	(-1.54)	(-1.66)
$(EQCAI-GWCAI)_{i,t-1}$	+	0.726***	0.700***	0.736***	0.697***	0.648***	0.614***	0.658***	0.610***
		(2.83)	(6.87)	(2.88)	(6.83)	(2.71)	(5.50)	(2.74)	(5.48)
$GWCAI_{i,t-1}$	+	0.827**	0.760**	0.830**	0.763**	0.536	0.158	0.535	0.139
		(2.07)	(2.41)	(2.07)	(2.41)	(1.52)	(0.61)	(1.52)	(0.53)
YEAR_2006		0.383**	0.493***	0.334**	0.498***	0.242	0.399**	0.171	0.335*
		(2.17)	(2.65)	(1.83)	(2.67)	(1.26)	(2.32)	(0.86)	(1.82)
YEAR_2007		-0.256	-0.237	-0.308	-0.230	-0.226	-0.196	-0.303	-0.263
		(-0.84)	(-1.04)	(-1.00)	(-1.01)	(-0.78)	(-0.87)	(-1.04)	(-1.12)
YEAR_2008		-2.315***	-1.318***	-2.360***	-1.312 ***	-1.925***	-1.155***	-1.990***	-1.209***
		(-4.29)	(-5.36)	(-4.33)	(-5.35)	(-3.86)	(-4.99)	(-3.94)	(-5.07)
YEAR_2009		-0.457	-0.195	-0.489	-0.182	-0.366	-0.058	-0.422	-0.102
		(-1.08)	(-0.82)	(-1.14)	-0.75)	(-0.92)	(-0.24)	(-1.04)	(-0.41)
$GROWTH\_SALES_{i,t}$						0.386**	0.510***	0.381**	0.509***
						(2.08)	(3.14)	(2.04)	(3.07)
$lnSIZE\_MV_{i,t}$						0.909***	0.615***	0.922***	0.629***
						(2.83)	(3.25)	(2.86)	(3.32)
$RESOURCES_{i,t}$						-2.165	-1.730	-2.046	-1.744
						(-0.78)	(-1.35)	(-0.73)	(-1.33)
GENERAL_ $INDUSTRIALS_{i,t}$						-2.305*	-1.538*	-2.259*	-1.493*
						(-1.83)	(-1.80)	(-1.77)	(-1.70)
CYCLICAL_ CONSUMER_ $GOODS_{i,t}$						-3.658***	-2.581**	-3.635**	-2.565**
						(-2.63)	(-2.48)	(-2.59)	(-2.44)
NON-CYCLICAL_ $CONSUMER\_GOODS_{i,t}$						-0.582	-0.650	-0.580	-0.466
						(-0.35)	(-0.63)	(-0.34)	(-0.44)
CYCLICAL_ $SERVICES_{i,t}$						-3.187**	-2.162**	-3.160**	-2.133**
						(-2.42)	(-2.49)	(-2.35)	(-2.38)
NON_CYCLICAL_ $SERVICES_{i,t}$						-6.756***	-3.844***	-6.813***	-3.901***
						(-4.15)	(-3.76)	(-4.06)	(-3.68)
$UTILITIES_{i,t}$						-3.595**	-2.137*	-3.598**	-2.135*
						(-2.25)	(-1.82)	(-2.21)	(-1.78)
INFORMATION_ $TECHNOLOGY_{i,t}$						-4.255***	-2.973***	-4.210***	-2.942***
						(-3.30)	(-3.41)	(-3.22)	(-3.29)
$FINANCE_{i,t}$						-2.592*	-1.770*	-2.546*	-1.721*
						(-1.95)	(-1.89)	(-1.88)	(-1.79)
N		767	721	762	717	767	722	762	719
F-value		17.82***	42.20***	17.41***	42.17***	14.09***	29.46***	14.15***	29.50***
Adjusted R^2		0.511	0.608	0.510	0.607	0.558	0.644	0.557	0.641
Max VIF		4.02	3.86	4.02	3.87	5.23	5.37	5.32	5.49
Mean VIF		2.02	1.97	2.02	1.97	2.37	2.34	2.39	2.36

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Stock price of firm i, time t, is dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $GAM_{i,t}$ is as-if accounted goodwill-amortisation charges of firm i, period t; $GIMC_{i,t}$ is as-if accounted goodwill-impairment loss under the amortisation-and-impairment method of goodwill of firm i, period t; $(EQCAI\text{-}GWCAI)_{i,t-1}$ is as-if accounted book equity reduced by as-if accounted book goodwill under the amortisation-and-impairment method of firm i, time t-1;$GWCA_{i,t-1}$is as-if accounted book goodwill under the amortisation-and-impairment method of goodwill of firm i, time t-1; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, from period t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of equity-market value of firm i, time t. YEAR_2006, YEAR_2007, YEAR_2008, YEAR_2009 are dummy variables equal 1 if the year is 2006, 2007, 2008 and 2009 respectively and otherwise 0. YEAR_2005 is the benchmark year. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\_GOODS_{i,t}$, NON_CYCLICAL_ $CONSUMER\_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector. Goodwill-impairment losses and goodwill-amortisation charges take positive values. Regression coefficients are unstandardised. t-statistics are given in parentheses. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). Observations with Cook's distance larger than 4/n where n is total number of observations are considered as outliers.

Table A40 – Excluding 2008 observations – hypothesis 2c

		Stock price t							
		Main model				Main model with control variables			
		Available sample		Non-missing		Available sample		Non-missing	
Test variables	Pred.	Inclusive outliers	Exclusive outliers	Inclusive outliers	Exclusive outliers	Inclusive outliers	Exclusive outliers	Inclusive outliers	Exclusive outliers
Intercept		1.829*** (3.66)	1.683*** (6.83)	1.795*** (3.65)	1.678*** (6.76)	-10.392 (-1.47)	-8.280** (-2.02)	-10.859 (-1.55)	-8.372** (-2.10)
$(E+GIM)_{i,t}$	+	3.133*** (3.04)	4.941*** (8.29)	3.190*** (3.02)	4.913*** (8.30)	2.601** (2.51)	4.300*** (6.59)	2.640** (2.51)	4.528*** (7.42)
$GAMC_{i,t}$		17.876*** (2.78)	9.728** (2.11)	17.706*** (2.77)	9.570** (2.04)	18.595** (2.88)	12.011*** (2.70)	18.446** (2.88)	10.468*** (2.23)
$GIMC_{i,t}$	-	-2.582 (-1.14)	-1.641 (-0.80)	-2.618 (-1.14)	-0.641 (-0.33)	-2.157 (-1.00)	-0.736 (-0.38)	-2.207 (-1.01)	-0.753 (-0.38)
$(EQCAI-GWCAI)_{i,t-1}$	+	0.939*** (2.69)	0.762*** (6.65)	0.963*** (2.79)	0.768*** (6.76)	0.853** (2.60)	0.596*** (4.83)	0.876*** (2.68)	0.599*** (4.89)
$GWCAI_{i,t-1}$	+	1.098** (2.38)	0.798** (2.38)	1.110** (2.40)	0.826** (2.44)	0.771* (1.86)	0.371 (1.21)	0.779* (1.88)	0.445 (1.43)
$GROWTH\_SALES_{i,t}$						0.351* (1.91)	0.365*** (4.31)	0.348* (1.90)	0.347*** (4.34)
$lnSIZE\_MV_{i,t}$						0.706** (2.16)	0.578*** (2.91)	0.724** (2.22)	0.577*** (2.96)
$RESOURCES_{i,t}$						-1.566 (-0.60)	-1.750 (-1.32)	-1.376 (-0.54)	-1.538 (-1.19)
$GENERAL\_INDUSTRIALS_{i,t}$						-2.265** (-1.97)	-1.671* (-1.93)	-2.212** (-1.91)	-1.615* (-1.84)
$CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-2.984** (-2.36)	-2.456** (-2.31)	-2.926** (-2.32)	-2.390** (-2.26)
$NON\text{-}CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-0.145 (-0.09)	-0.468 (-0.43)	-0.136 (-0.08)	-0.454 (-0.42)
$CYCLICAL\_SERVICES_{i,t}$						-2.960** (-2.44)	-2.255** (-2.55)	-2.916** (-2.37)	-2.198** (-2.43)
$NON\_CYCLICAL\_SERVICES_{i,t}$						-5.751*** (-4.01)	-3.748*** (-3.47)	-5.752*** (-3.92)	-3.684*** (-3.33)
$UTILITIES_{i,t}$						-3.273** (-2.35)	-2.309** (-2.03)	-3.288** (-2.31)	-2.331** (-2.04)
$INFORMATION\_TECHNOLOGY_{i,t}$						-3.998*** (-3.36)	-2.938*** (-3.27)	-3.918*** (-3.29)	-2.771*** (-3.03)
$FINANCE_{i,t}$						-2.617** (-2.19)	-1.956** (-2.04)	-2.567** (-2.11)	-1.989** (-2.07)
N		620	577	615	572	620	585	615	579
F-value		15.54***	59.76***	16.49***	61.16***	11.39***	32.13***	11.80***	33.84***
Adjusted R^2		0.576	0.616	0.577	0.617	0.612	0.676	0.614	0.680
Max VIF		3.96	3.50	3.97	3.51	4.85	5.02	4.95	5.13
Mean VIF		2.36	2.17	2.35	2.17	2.43	2.39	2.45	2.42

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Stock price of firm i, time t, is dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $GAM_{i,t}$ is as-if accounted goodwill-amortisation charges of firm i, period t; $GIMC_{i,t}$ is as-if accounted goodwill-impairment loss under the amortisation-and-impairment method of goodwill of firm i, period t; $(EQCAI\text{-}GWCAI)_{i,t-1}$ is as-if accounted book equity reduced by as-if accounted book goodwill under the amortisation-and-impairment method of firm i, time t-1;$GWCA_{i,t-1}$is as-if accounted book goodwill under the amortisation-and-impairment method of goodwill of firm i, time t-1; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, from period t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of equity-market value of firm i, time t. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector. Goodwill-impairment losses and goodwill-amortisation charges take positive values. Regression coefficients are unstandardised. t-statistics are given in parentheses. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). Observations with Cook’s distance larger than 4/n where n is total number of observations are considered as outliers.

Table A41 – Excluding large book goodwill – hypothesis 2c

		Stock price t							
		Main model				***Main model with control variables***			
		Available sample		*Non-missing*		*Available sample*		*Non-missing*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*
Intercept		2.378***	1.833***	2.360***	1.836***	-20.694***	-11.967***	-21.013***	-11.929***
		(6.82)	(6.69)	(6.80)	(6.67)	(-2.68)	(-2.77)	(-2.72)	(-2.76)
$(E+GIM)_{i,t}$	+	3.822***	4.901***	3.868***	4.895***	3.057***	4.030***	3.096***	4.029***
		(5.93)	(8.67)	(5.95)	(8.66)	(4.35)	(6.39)	(4.40)	(6.39)
$GAMC_{i,t}$		23.739**	21.081***	23.328**	20.752***	22.670**	19.702***	22.315**	19.635***
		(2.38)	(3.24)	(2.35)	(3.13)	(2.24)	(3.31)	(2.22)	(3.27)
$GIMC_{i,t}$	-	-4.982	-3.987**	-4.997	-3.999**	-4.375	-2.741**	-4.398	-2.748**
		(-1.55)	(-2.51)	(-1.54)	(-2.52)	(-1.46)	(-2.13)	(-1.46)	(-2.13)
$(EQCAI-GWCAI)_{i,t-1}$	+	0.455*	0.619***	0.465**	0.615***	0.406*	0.553***	0.416*	0.552***
		(1.95)	(5.85)	(1.99)	(5.82)	(1.77)	(4.50)	(1.80)	(4.49)
$GWCAI_{i,t-1}$	+	0.610	0.064	0.621	0.091	0.523	0.056	0.526	0.062
		(1.01)	(0.12)	(1.02)	(0.16)	(0.90)	(0.13)	(0.91)	(0.14)
$GROWTH\_SALES_{i,t}$						0.369*	0.899*	0.367*	0.913*
						(1.90)	(1.88)	(1.90)	(1.89)
$lnSIZE\_MV_{i,t}$						1.221***	0.741***	1.235***	0.737***
						(3.31)	(3.50)	(3.34)	(3.46)
$RESOURCES_{i,t}$						-2.797	-1.772	-2.720	-1.733
						(-1.03)	(-1.40)	(-0.99)	(-1.35)
GENERAL_ $INDUSTRIALS_{i,t}$						-2.162*	-1.631*	-2.134*	-1.593*
						(-1.69)	(-1.99)	(-1.64)	(-1.88)
CYCLICAL_ CONSUMER_ $GOODS_{i,t}$						-3.254**	-2.263**	-3.23**	-2.229**
						(-2.49)	(-2.19)	(-2.44)	(-2.12)
NON-CYCLICAL_ $CONSUMER\_GOODS_{i,t}$						-1.836	-1.167	-1.853	-1.127
						(-1.14)	(-1.15)	(-1.13)	(-1.08)
$CYCLICAL\_SERVICES_{i,t}$						-2.622**	-1.628*	-2.610**	-1.589*
						(-2.03)	(-1.84)	(-1.97)	(-1.75)
NON_CYCLICAL_ $SERVICES_{i,t}$						-5.992***	-3.814***	-6.014***	-3.770***
						(-3.79)	(-3.51)	(-3.70)	(-3.37)
$UTILITIES_{i,t}$						-3.467**	-2.018*	-3.488**	-1.978
						(-2.15)	(-1.70)	(-2.12)	(-1.63)
INFORMATION_ $TECHNOLOGY_{i,t}$						-3.648***	-2.775***	-3.611***	-2.744***
						(-3.03)	(-3.35)	(-2.95)	(-3.23)
$FINANCE_{i,t}$						-2.466*	-1.528*	-2.450*	-1.494
						(-1.84)	(-1.71)	(-1.79)	(-1.63)
N		563	523	559	520	563	528	559	525
F-value		31.85***	52.56***	32.44***	52.41***	19.33***	23.87***	19.62***	23.62***
Adjusted R^2		0.555	0.613	0.554	0.612	0.596	0.662	0.595	0.660
Max VIF		4.34	4.52	4.36	4.61	4.48	4.16	4.50	4.25
Mean VIF		2.59	2.57	2.59	2.60	2.37	2.24	2.38	2.27

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Stock price of firm i, time t, is dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $GAM_{i,t}$ is as-if accounted goodwill-amortisation charges of firm i, period t; $GIMC_{i,t}$ is as-if accounted goodwill-impairment loss under the amortisation-and-impairment method of goodwill of firm i, period t; $(EQCAI\text{-}GWCAI)_{i,t-1}$ is as-if accounted book equity reduced by as-if accounted book goodwill under the amortisation-and-impairment method of firm i, time t-1;$GWCA_{i,t-1}$is as-if accounted book goodwill under the amortisation-and-impairment method of goodwill of firm i, time t-1; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, from period t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of equity-market value of firm i, time t. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector. Goodwill-impairment losses and goodwill-amortisation charges take positive values. Regression coefficients are unstandardised. t-statistics are given in parentheses. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). Observations with Cook's distance larger than 4/n where n is total number of observations are considered as outliers.

Table A42 – Excluding large goodwill-impairment losses – hypothesis 2c

		Stock price t							
		Main model				*Main model with control variables*			
		Available sample		*Non-missing*		*Available sample*		*Non-missing*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*
Intercept		2.085*** (5.16)	1.742*** (7.59)	2.065*** (5.14)	1.749*** (7.58)	-15.126** (-2.28)	-12.098*** (-3.21)	-15.436** (-2.34)	-12.419*** (-3.29)
$(E+GIM)_{i,t}$	+	3.845*** (2.97)	5.028*** (9.66)	3.893*** (2.95)	5.018*** (9.65)	3.088** (2.44)	4.367*** (7.94)	3.128** (2.44)	4.381*** (7.98)
$GAMC_{i,t}$		15.973*** (2.86)	8.956** (2.14)	15.923*** (2.86)	8.891** (2.11)	16.199*** (2.95)	12.107*** (3.34)	16.160*** (2.95)	12.005*** (3.30)
$GIMC_{i,t}$	-	1.272 (0.07)	9.023** (2.18)	0.895 (0.05)	8.814** (2.14)	9.592 (0.58)	9.033 (1.62)	9.278 (0.56)	9.104 (1.63)
$(EQCAI\text{-}GWCAI)_{i,t-1}$	+	0.565* (1.91)	0.598*** (5.56)	0.576* (1.94)	0.596*** (5.53)	0.493* (1.86)	0.585*** (5.10)	0.502* (1.88)	0.584*** (5.09)
$GWCAI_{i,t-1}$	+	0.642 (1.31)	0.628** (2.03)	0.643 (1.31)	0.632** (2.03)	0.357 (0.86)	0.281 (1.10)	0.355 (0.85)	0.264 (1.03)
$GROWTH\_SALES_{i,t}$						0.547*** (2.74)	0.904** (2.18)	0.549*** (2.75)	0.925** (2.20)
$lnSIZE\_MV_{i,t}$						0.963*** (3.14)	0.750*** (4.11)	0.975*** (3.19)	0.765*** (4.16)
$RESOURCES_{i,t}$						-2.180 (-0.82)	-2.015 (-1.63)	-2.053 (-0.77)	-2.040 (-1.61)
$GENERAL\_INDUSTRIALS_{i,t}$						-2.683** (-2.10)	-1.540** (-1.98)	-2.655** (-2.06)	-1.516** (-1.89)
$CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-3.474*** (-2.78)	-2.817*** (-3.50)	-3.443*** (-2.73)	-2.809*** (-3.40)
$NON\text{-}CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-0.773 (-0.48)	-0.871 (-0.92)	-0.776 (-0.47)	-0.698 (-0.70)
$CYCLICAL\_SERVICES_{i,t}$						-3.373*** (-2.68)	-2.290*** (-2.81)	-3.352*** (-2.62)	-2.273*** (-2.70)
$NON\_CYCLICAL\_SERVICES_{i,t}$						-5.606*** (-4.24)	-3.962*** (-3.96)	-5.614*** (-4.14)	-3.993*** (-3.87)
$UTILITIES_{i,t}$						-3.612** (-2.43)	-2.236** (-2.01)	-3.623** (-2.39)	-2.250** (-1.98)
$INFORMATION\_TECHNOLOGY_{i,t}$						-4.592*** (-3.53)	-3.015*** (-3.63)	-4.552*** (-3.46)	-3.001*** (-3.52)
$FINANCE_{i,t}$						-2.813** (-2.20)	-1.867** (-2.14)	-2.773** (-2.14)	-1.839** (-2.05)
N		724	674	719	670	724	683	719	680
F-value		22.09***	64.73***	22.45***	64.49***	14.77***	31.26***	14.72***	31.36***
Adjusted R^2		0.519	0.613	0.518	0.611	0.569	0.675	0.569	0.672
Max VIF		3.84	3.90	3.85	3.91	4.89	5.07	4.99	5.19
Mean VIF		2.35	2.35	2.34	2.36	2.46	2.46	2.47	2.48

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Stock price of firm i, time t, is dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $GAM_{i,t}$ is as-if accounted goodwill-amortisation charges of firm i, period t; $GIMC_{i,t}$ is as-if accounted goodwill-impairment loss under the amortisation-and-impairment method of goodwill of firm i, period t; $(EQCAI\text{-}GWCAI)_{i,t-1}$ is as-if accounted book equity reduced by as-if accounted book goodwill under the amortisation-and-impairment method of firm i, time t-1;$GWCA_{i,t-1}$is as-if accounted book goodwill under the amortisation-and-impairment method of goodwill of firm i, time t-1; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, from period t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of equity-market value of firm i, time t. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector. Goodwill-impairment losses and goodwill-amortisation charges take positive values. Regression coefficients are unstandardised. t-statistics are given in parentheses. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). Observations with Cook's distance larger than 4/n where n is total number of observations are considered as outliers.

Table A43 – Stock price measured with time lag t+2 months – hypothesis 2c

		Stock price t+2 months							
		Main model				***Main model with control variables***			
		Available sample		*Non-missing*		*Available sample*		*Non-missing*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*
Intercept		2.402***	1.796***	2.386***	1.780***	-15.486**	-11.041***	-15.812**	-11.033***
		(6.38)	(7.32)	(6.40)	(7.31)	(-2.28)	(-2.97)	(-2.34)	(-2.96)
$(E+GIM)_{i,t}$	+	3.217***	4.767***	3.252***	4.760***	2.499***	3.651***	2.525***	3.649***
		(4.13)	(9.30)	(4.12)	(9.28)	(3.24)	(6.59)	(3.24)	(6.58)
$GAMC_{i,t}$		11.859**	7.471*	11.784**	7.418*	12.052**	9.189**	11.981**	9.210***
		(2.21)	(1.86)	(2.19)	(1.84)	(2.33)	(2.63)	(2.32)	(2.62)
$GIMC_{i,t}$	-	-3.527*	-1.205	-3.564*	-1.211	-2.682	-1.172	-2.726	-1.182
		(-1.65)	(-1.11)	(-1.65)	(-1.11)	(-1.34)	(-1.16)	(-1.35)	(-1.17)
$(EQCAI\text{-}GWCAI)_{i,t-1}$	+	0.645**	0.707***	0.656**	0.705***	0.558**	0.562***	0.569**	0.560***
		(2.54)	(6.41)	(2.59)	(6.38)	(2.30)	(4.94)	(2.35)	(4.92)
$GWCAI_{i,t-1}$	+	0.838**	0.737**	0.842**	0.742**	0.558	0.390	0.559	0.388
		(2.01)	(2.43)	(2.01)	(2.44)	(1.51)	(1.61)	(1.51)	(1.60)
$GROWTH\_SALES_{i,t}$						0.573***	1.068**	0.568***	1.062**
						(3.23)	(2.54)	(3.21)	(2.50)
$lnSIZE\_MV_{i,t}$						1.011***	0.728***	1.025***	0.727***
						(3.16)	(4.00)	(3.20)	(3.97)
$RESOURCES_{i,t}$						-2.394	-1.462	-2.291	-1.434
						(-0.88)	(-1.13)	(-0.84)	(-1.09)
$GENERAL\_INDUSTRIALS_{i,t}$						-3.066**	-1.973**	-3.054**	-1.957**
						(-2.24)	(-2.39)	(-2.20)	(-2.31)
$CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-3.440**	-2.814***	-3.426**	-2.796***
						(-2.21)	(-2.76)	(-2.18)	(-2.70)
$NON\text{-}CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-1.259	-1.097	-1.277	-1.097
						(-0.74)	(-1.13)	(-0.74)	(-1.08)
$CYCLICAL\_SERVICES_{i,t}$						-3.666**	-2.515***	-3.658**	-2.495***
						(-2.62)	(-3.03)	(-2.56)	(-2.92)
$NON\_CYCLICAL\_SERVICES_{i,t}$						-7.326***	-4.483***	-7.355***	-4.461***
						(-4.30)	(-4.42)	(-4.21)	(-4.28)
$UTILITIES_{i,t}$						-4.206**	-2.415**	-4.235**	-2.393**
						(-2.41)	(-2.07)	(-2.38)	(-2.01)
$INFORMATION\_TECHNOLOGY_{i,t}$						-4.692***	-3.330***	-4.666***	-3.314***
						(-3.30)	(-3.71)	(-3.23)	(-3.61)
$FINANCE_{i,t}$						-3.070**	-1.994**	-3.043**	-1.957**
						(-2.19)	(-2.22)	(-2.13)	(-2.13)
N		767	713	762	709	767	717	762	713
F-value		18.32***	44.86***	18.85***	44.72***	10.74***	24.04***	10.97***	23.76***
Adjusted R^2		0.479	0.585	0.478	0.584	0.536	0.612	0.536	0.610
Max VIF		3.97	3.77	3.97	3.78	5.16	5.23	5.26	5.34
Mean VIF		2.36	2.25	2.35	2.26	2.52	2.45	2.53	2.47

Stock price of firm i, time t+2 months, is dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $GAM_{i,t}$ is as-if accounted goodwill-amortisation charges of firm i, period t; $GIMC_{i,t}$ is as-if accounted goodwill-impairment loss under the amortisation-and-impairment method of goodwill of firm i, period t; $(EQCAI\text{-}GWCAI)_{i,t-1}$ is as-if accounted book equity reduced by as-if accounted book goodwill under the amortisation-and-impairment method of firm i, time t-1;$GWCA_{i,t-1}$is as-if accounted book goodwill under the amortisation-and-impairment method of goodwill of firm i, time t-1; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, from period t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of equity-market value of firm i, time t. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector. Goodwill-impairment losses and goodwill-amortisation charges take positive values. Regression coefficients are unstandardised. t-statistics are given in parentheses. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). Observations with Cook's distance larger than 4/n where n is total number of observations are considered as outliers.

Table A44 – Stock price measured with time lag t+3 months – hypothesis 2c

		Stock price t +3 months							
		Main model				***Main model with control variables***			
		Available sample		*Non-missing*		*Available sample*		*Non-missing*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*
Intercept		2.412***	1.730***	2.399***	1.734***	-15.975**	-10.860***	-16.248**	-10.842***
		(6.64)	(7.68)	(6.63)	(7.65)	(-2.39)	(-3.06)	(-2.44)	(-3.05)
$(E+GIM)_{i,t}$	+	3.373***	5.115***	3.401***	5.107***	2.650***	4.039***	2.672***	4.037***
		(4.34)	(10.00)	(4.32)	(9.99)	(3.47)	(7.92)	(3.47)	(7.92)
$GAMC_{i,t}$		10.632**	6.143	10.572**	6.089 (1.60)	10.596**	5.404	10.545**	5.415
		(2.11)	(1.63)	(2.09)		(2.18)	(1.52)	(2.17)	(1.51)
$GIMC_{i,t}$	-	-3.282*	-1.453	-3.312*	-1.459	-2.457	-1.325	-2.494	-1.336
		(-1.79)	(-1.41)	(-1.79)	(-1.41)	(-1.46)	(-1.31)	(-1.46)	(-1.32)
$(EQCAI\text{-}GWCAI)_{i,t-1}$	+	0.580**	0.722***	0.589**	0.719***	0.493**	0.497***	0.502**	0.496***
		(2.43)	(7.46)	(2.47)	(7.41)	(2.18)	(4.21)	(2.21)	(4.19)
$GWCAI_{i,t-1}$	+	0.948**	0.831***	0.951**	0.836***	0.688*	0.639**	0.689*	0.638**
		(2.34)	(2.85)	(2.34)	(2.85)	(1.92)	(2.32)	(1.92)	(2.31)
$GROWTH\_SALES_{i,t}$						0.534***	0.564***	0.532***	0.564***
						(3.07)	(4.11)	(3.06)	(4.11)
$lnSIZE\_MV_{i,t}$						1.034***	0.719***	1.046***	0.717***
						(3.30)	(4.12)	(3.32)	(4.09)
$RESOURCES_{i,t}$						-2.369	-1.232	-2.269	-1.195
						(-0.86)	(-1.11)	(-0.82)	(-1.06)
$GENERAL\_INDUSTRIALS_{i,t}$						-3.007**	-1.906**	-2.984**	-1.879**
						(-2.19)	(-2.53)	(-2.13)	(-2.43)
$CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-3.382**	-2.732***	-3.359**	-2.706***
						(-2.17)	(-3.15)	(-2.14)	(-3.05)
$NON\text{-}CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-1.476	-1.208	-1.480	-1.176
						(-0.89)	(-1.39)	(-0.88)	(-1.32)
$CYCLICAL\_SERVICES_{i,t}$						-3.674***	-2.479***	-3.656**	-2.450***
						(-2.65)	(-3.33)	(-2.58)	(-3.20)
$NON\_CYCLICAL\_SERVICES_{i,t}$						-7.304***	-4.765***	-7.316***	-4.732***
						(-4.30)	(-5.00)	(-4.20)	(-4.84)
$UTILITIES_{i,t}$						-4.389**	-2.649**	-4.402**	-2.617**
						(-2.54)	(-2.47)	(-2.50)	(-2.40)
$INFORMATION\_TECHNOLOGY_{i,t}$						-4.513***	-3.033***	-4.481***	-3.007***
						(-3.14)	(-3.58)	(-3.07)	(-3.48)
$FINANCE_{i,t}$						-2.926**	-1.795**	-2.892**	-1.751**
						(-2.09)	(-2.18)	(-2.02)	(-2.07)
N		767	713	762	709	767	715	762	711
F-value		19.29***	68.12***	19.62***	67.65***	10.10***	38.67***	10.24***	38.29***
Adjusted R^2		0.484	0.587	0.482	0.586	0.539	0.617	0.537	0.615
Max VIF		3.97	3.82	3.97	3.83	5.16	5.18	5.26	5.29
Mean VIF		2.36	2.26	2.35	2.27	2.52	2.44	2.53	2.47

Stock price of firm i, time t+3 months, is dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $GAM_{i,t}$ is as-if accounted goodwill-amortisation charges of firm i, period t; $GIMC_{i,t}$ is as-if accounted goodwill-impairment loss under the amortisation-and-impairment method of goodwill of firm i, period t; $(EQCAI\text{-}GWCAI)_{i,t-1}$ is as-if accounted book equity reduced by as-if accounted book goodwill under the amortisation-and-impairment method of firm i, time t-1;$GWCA_{i,t-1}$is as-if accounted book goodwill under the amortisation-and-impairment method of goodwill of firm i, time t-1; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, from period t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of equity-market value of firm i, time t. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector. Goodwill-impairment losses and goodwill-amortisation charges take positive values. Regression coefficients are unstandardised. t-statistics are given in parentheses. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). Observations with Cook's distance larger than 4/n where n is total number of observations are considered as outliers.

Table A45 – Stock price measured with time lag t+4 months - hypothesis 2c

		Stock price t +4 months							
		Main model				***Main model with control variables***			
		Available sample		*Non-missing*		*Available sample*		*Non-missing*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*
Intercept		2.442***	1.903***	2.425***	1.905***	-15.460**	-10.640***	-15.702**	-10.576***
		(7.00)	(7.68)	(6.99)	(7.68)	(-2.27)	(-2.85)	(-2.31)	(-2.83)
$(E+GIM)_{i,t}$	+	3.417***	4.950***	3.443***	4.934***	2.662***	4.014***	2.684***	4.008***
		(4.24)	(9.66)	(4.23)	(9.67)	(3.43)	(7.56)	(3.43)	(7.56)
$GAMC_{i,t}$		12.439**	4.001	12.418**	3.970	12.586**	4.405	12.584**	4.461
		(2.28)	(1.23)	(2.27)	(1.22)	(2.37)	(1.60)	(2.37)	(1.61)
$GIMC_{i,t}$	-	-2.987*	-1.384	-3.013*	-1.390	-2.173	-1.319	-2.215	-1.343
		(-1.78)	(-1.24)	(-1.78)	(-1.24)	(-1.43)	(-1.24)	(-1.43)	(-1.27)
$(EQCAI\text{-}GWCAI)_{i,t-1}$	+	0.617***	0.673***	0.624***	0.669***	0.520***	0.573***	0.529***	0.571***
		(2.65)	(6.31)	(2.69)	(6.27)	(2.37)	(4.59)	(2.41)	(4.56)
$GWCAI_{i,t-1}$	+	0.807*	0.981***	0.809*	0.986***	0.533	0.757***	0.532	0.757***
		(1.96)	(3.47)	(1.96)	(3.47)	(1.46)	(2.95)	(1.46)	(2.94)
$GROWTH\_SALES_{i,t}$						0.539***	0.823*	0.539***	0.832*
						(3.10)	(1.92)	(3.09)	(1.92)
$lnSIZE\_MV_{i,t}$						1.013***	0.705***	1.019***	0.697***
						(3.17)	(3.85)	(3.17)	(3.80)
$RESOURCES_{i,t}$						-1.979	-1.285	-1.792	-1.153
						(-0.72)	(-1.16)	(-0.65)	(-1.03)
$GENERAL\_INDUSTRIALS_{i,t}$						-3.026**	-1.810**	-3.372**	-1.702**
						(-2.06)	(-2.30)	(-2.03)	(-2.11)
$CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-3.473**	-2.723***	-3.473**	-2.616***
						(-2.11)	(-2.96)	(-2.11)	(-2.78)
$NON\text{-}CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-1.345	-1.101	-1.264	-0.981
						(-0.78)	(-1.19)	(-0.72)	(-1.04)
$CYCLICAL\_SERVICES_{i,t}$						-3.727**	-2.424***	-3.632**	-2.312***
						(-2.57)	(-3.10)	(-2.45)	(-2.88)
$NON\_CYCLICAL\_SERVICES_{i,t}$						-7.328***	-4.674***	-7.244***	-4.539***
						(-4.07)	(-4.70)	(-3.94)	(-4.47)
$UTILITIES_{i,t}$						-4.429**	-2.501**	-4.352**	-2.375**
						(-2.48)	(-2.24)	(-2.39)	(-2.10)
$INFORMATION\_TECHNOLOGY_{i,t}$						-4.616***	-3.148***	-4.508***	-3.044***
						(-3.09)	(-3.87)	(-2.97)	(-3.67)
$FINANCE_{i,t}$						-3.063**	-1.866**	-2.950**	-1.743**
						(-2.09)	(-2.19)	(-1.97)	(-2.00)
N		767	713	762	709	767	715	762	711
F-value		24.27***	46.65***	24.70***	46.94***	11.60***	36.37***	11.77***	35.92***
Adjusted R^2		0.490	0.577	0.488	0.576	0.545	0.629	0.543	0.627
Max VIF		3.97	4.13	3.97	4.15	5.16	5.22	5.26	5.34
Mean VIF		2.36	2.40	2.35	2.41	2.52	2.50	2.53	2.53

Stock price of firm i, time t+4 months, is dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $GAM_{i,t}$ is as-if accounted goodwill-amortisation charges of firm i, period t; $GIMC_{i,t}$ is as-if accounted goodwill-impairment loss under the amortisation-and-impairment method of goodwill of firm i, period t; $(EQCAI\text{-}GWCAI)_{i,t-1}$ is as-if accounted book equity reduced by as-if accounted book goodwill under the amortisation-and-impairment method of firm i, time t-1;$GWCA_{i,t-1}$is as-if accounted book goodwill under the amortisation-and-impairment method of goodwill of firm i, time t-1; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, from period t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of equity-market value of firm i, time t. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector. Goodwill-impairment losses and goodwill-amortisation charges take positive values. Regression coefficients are unstandardised. t-statistics are given in parentheses. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). Observations with Cook's distance larger than 4/n where n is total number of observations are considered as outliers.

Table A46 – Scaled by total assets t-1 – hypothesis 2c

		Market value scaled by total assets t-1							
		Main model				***Main model with control variables***			
		Available sample		*Non-missing*		*Available sample*		*Non-missing*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*
Intercept		4.198***	0.250***	0.429***	0.246***	-0.119	-0.578	-0.162	-0.719
		(6.62)	(3.74)	(3.10)	(3.66)	(-0.13)	(-0.87)	(-0.17)	(-1.08)
$(E+GIM)_{i,t}$	+	14.344***	7.407***	6.455***	7.420***	6.392***	7.281***	6.385***	7.329***
		(3.44)	(11.73)	(3.87)	(11.74)	(3.84)	(11.66)	(3.83)	(11.70)
$GAMC_{i,t}$		15.815***	15.520***	15.792***	15.439***	16.237***	14.032***	16.227***	13.937***
		(3.62)	(12.05)	(3.60)	(11.79)	(3.51)	(6.96)	(3.47)	(6.79)
$GIMC_{i,t}$	-	-3.998*	-4.596***	-4.009*	-4.610***	-3.577*	-3.366**	-3.583*	-3.338**
		(-1.87)	(-3.18)	(-1.87)	(-3.18)	(-1.74)	(-2.57)	(-1.74)	(-2.55)
$(EQCAI-GWCAI)_{i,t-1}$	+	0.508*	0.651***	0.517*	0.666***	0 .446	0.535***	0.449	0.538***
		(1.64)	(3.16)	(1.66)	(3.23)	(1.52)	(2.72)	(1.52)	(2.75)
$GWCAI_{i,t-1}$	+	-0.154	0.257	-0.145	0.275	-0.274	-0.113	-0.270	-0.119
		(-0.30)	(1.01)	(-0.28)	(1.01)	(-0.57)	(-0.41)	(-0.55)	(-0.43)
$GROWTH\_SALES_{i,t}$						0.128*	0.226**	0.126*	0.217**
						(1.96)	(2.42)	(1.96)	(2.30)
$lnSIZE\_MV_{i,t}$						0.037	0.046	0.039	0.053*
						(0.82)	(1.46)	(0.87)	(1.66)
$RESOURCES_{i,t}$						-0.587*	-0.567**	-0.578*	-0.566**
						(-1.85)	(-2.57)	(-1.81)	(-2.53)
*GENERAL_*						-0.136	0.031	-0.145	0.027
$INDUSTRIALS_{i,t}$						(-0.78)	(0.26)	(-0.82)	(0.22)
*CYCLICAL_*						-0.430**	-0.148	-0.436**	-0.151
$CONSUMER\_ GOODS_{i,t}$						(-2.16)	(-1.40)	(-2.16)	(-1.42)
*NON-CYCLICAL_*						0.009	0.075	-0.002	0.086
$CONSUMER\_GOODS_{i,t}$						(0.04)	(0.56)	(-0.01)	(0.62)
$CYCLICAL\_SERVICES_{i,t}$						-0.256	-0.106	-0.262	-0.109
						(-1.37)	(-0.97)	(-1.38)	(-0.97)
*NON_CYCLICAL_*						-0.448**	-0.264*	-0.462**	-0.287*
$SERVICES_{i,t}$						(-1.97)	(-1.68)	(-2.00)	(-1.78)
$UTILITIES_{i,t}$						-0.573***	-0.344**	-0.583***	-0.357**
						(-2.69)	(-2.51)	(-2.69)	(-2.55)
*INFORMATION_*						-0.343	-0.004	-0.348	0.001
$TECHNOLOGY_{i,t}$						(-1.35)	(-0.02)	(-1.35)	(0.01)
$FINANCE_{i,t}$						-0.185	-0.242**	-0.191	-0.246**
						(-0.75)	(-2.15)	(-0.76)	(-2.12)
N		767	725	762	720	767	726	762	722
F-value		5.21***	76.45***	30.81***	76.04***	16.80***	26.65***	16.79***	26.19***
Adjusted R^2		0.075	0.471	0.434	0.473	0.445	0.519	0.445	0.522
Max VIF		4.37	2.08	4.39	2.09	5.28	5.52	5.38	5.63
Mean VIF		2.38	1.45	2.39	1.45	2.54	2.25	2.56	2.28

Market value of firm i, time t, scaled by total assets at time t-1, is dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $GAM_{i,t}$ is as-if accounted goodwill-amortisation charges of firm i, period t; $GIMC_{i,t}$ is as-if accounted goodwill-impairment loss under the amortisation-and-impairment method of goodwill of firm i, period t; $(EQCAI-GWCAI)_{i,t-1}$ is as-if accounted book equity reduced by as-if accounted book goodwill under the amortisation-and-impairment method of firm i, time t-1;$GWCA_{i,t-1}$is as-if accounted book goodwill under the amortisation-and-impairment method of goodwill of firm i, time t-1; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, from period t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of equity-market value of firm i, time t. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\_GOODS_{i,t}$, NON_CYCLICAL_ $CONSUMER\_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector. Goodwill-impairment losses and goodwill-amortisation charges take positive values. Regression coefficients are unstandardised. t-statistics are given in parentheses. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). Observations with Cook's distance larger than 4/n where n is total number of observations are considered as outliers.

Table A47 – Scaled by total sales t – hypothesis 2c

		Market value scaled by total sales t							
		Main model				*Main model with control variables*			
		Available sample		*Non-missing*		*Available sample*		*Non-missing*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*
Intercept		0.509*** (4.36)	0.441*** (8.18)	0.509*** (4.34)	0.440*** (8.12)	-0.881 (-0.62)	-1.784** (-2.00)	-0.928 (-0.66)	-1.827** (-2.06)
$(E+GIM)_{i,t}$	+	3.196*** (7.23)	4.014*** (10.48)	3.197*** (7.22)	4.018*** (10.48)	3.009*** (7.18)	3.412*** (9.87)	3.007*** (7.17)	3.413*** (9.88)
$GAMC_{i,t}$		12.292*** (4.44)	12.056*** (9.87)	12.239*** (4.40)	11.769*** (8.41)	11.488*** (4.20)	11.015*** (11.36)	11.469*** (4.18)	10.850*** (10.68)
$GIMC_{i,t}$	-	-2.755*** (-2.63)	-2.169*** (-3.38)	-2.758*** (-2.63)	-2.185*** (-3.40)	-2.371** (-2.55)	-2.403*** (-2.63)	-2.373** (-2.55)	-2.414*** (-2.64)
$(EQCAI\text{-}GWCAI)_{i,t-1}$	+	0.886*** (6.34)	0.940*** (15.92)	0.886*** (6.34)	0.940*** (15.92)	0.778*** (5.28)	0.898*** (15.81)	0.779*** (5.27)	0.902*** (15.73)
$GWCAI_{i,t-1}$	+	0.847** (2.14)	0.525*** (2.69)	0.853** (2.14)	0.550*** (2.70)	0.717* (1.87)	0.542*** (3.08)	0.719* (1.86)	0.562*** (3.12)
$GROWTH\_SALES_{i,t}$						0.124* (1.82)	0.349** (2.52)	0.122* (1.82)	0.349** (2.50)
$lnSIZE\_MV_{i,t}$						0.075 (1.16)	0.103** (2.48)	0.077 (1.19)	0.105** (2.53)
$RESOURCES_{i,t}$						-0.231 (-0.53)	-0.297 (-1.31)	-0.217 (-0.49)	-0.280 (-1.23)
$GENERAL\_INDUSTRIALS_{i,t}$						-0.202 (-0.65)	0.084 (0.62)	-0.206 (-0.65)	0.085 (0.61)
$CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-0.532* (-1.70)	-0.269* (-1.78)	-0.535* (-1.67)	-0.266* (-1.74)
$NON\text{-}CYCLICAL\_CONSUMER\_GOODS_{i,t}$						0.151 (0.43)	0.223 (1.23)	0.144 (0.40)	0.221 (1.20)
$CYCLICAL\_SERVICES_{i,t}$						-0.326 (-1.05)	-0.041 (-0.30)	-0.330 (-1.03)	-0.040 (-0.29)
$NON\_CYCLICAL\_SERVICES_{i,t}$						-0.950** (-2.34)	-0.419*** (-2.75)	-0.961** (-2.33)	-0.422*** (-2.70)
$UTILITIES_{i,t}$						-0.420 (-1.09)	-0.008 (0.04)	-0.428 (-1.09)	0.005 (0.02)
$INFORMATION\_TECHNOLOGY_{i,t}$						0.206 (0.49)	0.278 (1.10)	0.204 (0.48)	0.284 (1.11)
$FINANCE_{i,t}$						0.609 (1.22)	0.356** (2.11)	0.602 (1.18)	0.341* (1.94)
N		767	718	762	713	767	714	762	709
F-value		16.74***	103.62***	16.66***	94.55***	17.27***	92.29***	17.59***	84.98***
Adjusted R^2		0.653	0.564	0.653	0.564	0.673	0.626	0.672	0.626
Max VIF		1.60	2.33	1.60	2.37	5.12	5.38	5.22	5.50
Mean VIF		1.26	1.54	1.27	1.56	2.18	2.20	2.20	2.23

Market value of firm i, time t, scaled by total sales period t, is dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $GAM_{i,t}$ is as-if accounted goodwill-amortisation charges of firm i, period t; $GIMC_{i,t}$ is as-if accounted goodwill-impairment loss under the amortisation-and-impairment method of goodwill of firm i, period t; $(EQCAI\text{-}GWCAI)_{i,t-1}$ is as-if accounted book equity reduced by as-if accounted book goodwill under the amortisation-and-impairment method of firm i, time t-1;$GWCA_{i,t-1}$is as-if accounted book goodwill under the amortisation-and-impairment method of goodwill of firm i, time t-1; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, from period t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of equity-market value of firm i, time t. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector. Goodwill-impairment losses and goodwill-amortisation charges take positive values. Regression coefficients are unstandardised. t-statistics are given in parentheses. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). Observations with Cook's distance larger than 4/n where n is total number of observations are considered as outliers.

Table A48 – Control for size – hypothesis 2c

		Stock price t							
		Main model				***Main model with control variables***			
		Available sample		*Non-missing*		*Available sample*		*Non-missing*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*
Intercept		-2.961*** (-6.57)	-3.340*** (-11.18)	-2.984*** (-6.67)	-3.316*** (-11.15)	19.803*** (2.97)	24.778*** (6.52)	19.514*** (2.93)	24.791*** (6.51)
$(E+GIM)_{i,t}$	+	2.005** (2.56)	3.584*** (7.28)	2.049** (2.58)	3.565*** (7.29)	2.398*** (2.77)	4.064*** (7.12)	2.421*** (2.78)	4.062*** (7.11)
$GAMC_{i,t}$		11.399** (2.28)	6.483** (2.04)	11.369** (2.29)	6.468** (2.02)	12.989*** (2.55)	9.439*** (2.67)	12.929*** (2.55)	9.436*** (2.65)
$GIMC_{i,t}$	-	-3.403* (-1.76)	-1.587 (-1.30)	-3.447* (-1.76)	-1.574 (-1.30)	-3.624* (-1.78)	-2.380** (-2.52)	-3.664* (-1.77)	-2.389** (-2.53)
$(EQCAI\text{-}GWCAI)_{i,t-1}$	+	0.595** (2.22)	0.619*** (5.46)	0.609** (2.29)	0.601*** (5.59)	0.616** (2.54)	0.583*** (5.41)	0.626** (2.57)	0.581*** (5.38)
$GWCAI_{i,t-1}$	+	0.715** (1.99)	0.497* (1.76)	0.715** (1.99)	0.492* (1.73)	0.628* (1.80)	0.429* (1.79)	0.628* (1.80)	0.429* (1.78)
$GROWTH\_SALES_{i,t}$						0.446** (2.28)	0.531*** (3.44)	0.445** (2.28)	0.532*** (3.43)
$lnSIZE\_MV_{i,t}$						-0.949*** (-3.02)	-1.253*** (-6.83)	-0.937*** (-2.97)	-1.255*** (-6.80)
$RESOURCES_{i,t}$						-2.489 (-0.87)	-1.955 (-1.51)	-2.382 (-0.83)	-1.924 (-1.47)
$GENERAL\_INDUSTRIALS_{i,t}$						-2.712** (-2.09)	-1.767** (-2.20)	-2.686** (-2.04)	-1.742** (-2.11)
$CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-3.447** (-2.52)	-2.796*** (-3.36)	-3.428** (-2.48)	-2.775*** (-3.24)
$NON\text{-}CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-0.930 (-0.55)	-0.732 (-0.74)	-0.933 (-0.54)	-0.706 (-0.70)
$CYCLICAL\_SERVICES_{i,t}$						-3.385** (-2.51)	-2.238*** (-2.70)	-3.366** (-2.44)	-2.213** (-2.59)
$NON\_CYCLICAL\_SERVICES_{i,t}$						-6.908*** (-4.26)	-4.070*** (-4.02)	-6.920*** (-4.16)	-4.043*** (-3.88)
$UTILITIES_{i,t}$						-4.076** (-2.46)	-2.307** (-2.02)	-4.089** (-2.42)	-2.280* (-1.96)
$INFORMATION\_TECHNOLOGY_{i,t}$						-4.477*** (-3.35)	-3.068*** (-3.66)	-4.443*** (-3.27)	-3.047*** (-3.55)
$FINANCE_{i,t}$						-2.747** (-2.02)	-1.751* (-1.95)	-2.711* (-1.95)	-1.712* (-1.86)
N		767	718	762	715	767	720	762	716
F-value		8.88***	41.61***	9.23***	47.78***	12.80***	35.41***	13.01***	35.31***
Adjusted R^2		0.355	0.400	0.357	0.419	0.425	0.561	0.427	0.560
Max VIF		3.97	3.38	3.97	3.39	5.16	5.34	5.26	5.46
Mean VIF		2.36	2.07	2.35	2.10	2.52	2.49	2.53	2.52

The dependent variable is unstandardised residuals from a regression of stock prices on size where size is measured as natural logarithm of equity-market value at the end of the fiscal year. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $GAM_{i,t}$ is as-if accounted goodwill-amortisation charges of firm i, period t; $GIMC_{i,t}$ is as-if accounted goodwill-impairment loss under the amortisation-and-impairment method of goodwill of firm i, period t; $(EQCAI\text{-}GWCAI)_{i,t-1}$ is as-if accounted book equity reduced by as-if accounted book goodwill under the amortisation-and-impairment method of firm i, time t-1;$GWCA_{i,t-1}$is as-if accounted book goodwill under the amortisation-and-impairment method of goodwill of firm i, time t-1; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, from period t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of equity-market value of firm i, time t. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector. Goodwill-impairment losses and goodwill-amortisation charges take positive values. Regression coefficients are unstandardised. t-statistics are given in parentheses. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). Observations with Cook's distance larger than 4/n where n is total number of observations are considered as outliers.

Table A49 – Including year dummies – hypothesis 2d

		Stock return t			
		Main model		***Main model, year-dummies and control variables***	
		Available sample / Non-missing sample		*Available sample / Non-missing sample*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*
Intercept		0.167***	0.175***	-0.499**	-0.463***
		(4.35)	(6.40)	(-1.97)	(-2.71)
$(E+GIM)_{i,t}$	+	1.636***	1.424***	1.311***	1.106***
		(3.97)	(7.77)	(3.39)	(5.83)
$\Delta(E+GIM)_{i,t,t-1}$		-0.363	-0.271**	-0.258	-0.233*
	+	(-1.60)	(-2.31)	(-1.17)	(-1.96)
$GAMC_{i,t}$		2.285***	0.737	2.527***	1.338**
		(2.68)	(1.45)	(3.11)	(2.53)
$\Delta GAMC_{i,t,t-1}$		2.382	3.017***	2.255*	2.361**
		(1.55)	(3.17)	(1.66)	(2.26)
$GIMC_{i,t}$	-	-0.917**	-0.946*	-0.825**	-1.488***
		(-2.42)	(-1.78)	(-2.23)	(-2.89)
$\Delta GIMC_{i,t,t-1}$	-	-0.195	-0.988***	-0.193	-0.259**
		(-1.29)	(-2.88)	(-1.35)	(-2.06)
YEAR_2006		-0.106***	-0.079***	-0.124***	-0.085***
		(-3.25)	(-2.87)	(-3.78)	(-3.16)
YEAR_2007		-0.377***	-0.350***	-0.399***	-0.377***
		(-11.32)	(-11.71)	(-11.85)	(-13.28)
YEAR_2008		-0.614***	-0.599***	-0.626***	-0.606***
		(-13.56)	(-18.89)	(-14.24)	(-18.94)
YEAR_2009		0.101*	0.023	0.081	0.039
		(1.94)	(0.61)	(1.51)	(1.00)
$GROWTH\_SALES_{i,t}$				0.023	0.032
				(1.09)	(0.60)
$lnSIZE\_MV_{i,t}$				0.036***	0.035***
				(2.93)	(4.38)
$LEVERAGE_{i,t-1}$				$5.86*10^{-5}$***	$2.28*10^{-4}$
				(2.63)	(-0.45)
$RESOURCES_{i,t}$				0.155*	0.018
				(1.77)	(0.28)
$GENERAL\_INDUSTRIALS_{i,t}$				-0.035	-0.049
				(-0.91)	(-1.57)
$CYCLICAL\_CONSUMER\_GOODS_{i,t}$				-0.181***	-0.186***
				(-3.77)	(-3.78)
$NON\text{-}CYCLICAL\_CONSUMER\_GOODS_{i,t}$				-0.137***	-0.149***
				(-3.24)	(-4.23)
$CYCLICAL\_SERVICES_{i,t}$				-0.108***	-0.139***
				(-2.84)	(-4.29)
$NON\_CYCLICAL\_SERVICES_{i,t}$				-0.339***	-0.303***
				(-4.58)	(-5.20)
$UTILITIES_{i,t}$				-0.131**	-0.129***
				(-2.61)	(-3.23)
$INFORMATION\_TECHNOLOGY_{i,t}$				-0.018	-0.107***
				(-0.24)	(-2.66)
$FINANCE_{i,t}$				-0.017	-0.073*
				(-0.38)	(-1.85)
N		762	728	762	720
F-value		51.40***	68.10***	39.00***	36.11***
Adjusted R^2		0.411	0.488	0.429	0.512
Max VIF		2.37	1.72	5.26	5.19
Mean VIF		1.65	1.47	2.09	1.99

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Stock return of firm i, period t, is dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $\Delta\ (E+GIM)_{i,t,t-1}$ is changes in pre-impairment net earnings of firm i from period t-1 to t; $GAMC_{i,t}$ is as-if accounted goodwill-amortisation charges under the amortisation-and-impairment method of firm i, period t; $\Delta GAMC_{i,t,t-1}$ is changes in as-if accounted goodwill-amortisation charges under the amortisation-and-impairment method of firm i from period t-1 to t; $GIMC_{i,t}$ is as-if accounted goodwill-impairment losses under the amortisation-and-impairment method of firm i, period t; $\Delta GIMC_{i,t,t-1}$ is changes in as-if accounted goodwill-impairment losses under the amortisation-and-impairment method of firm i from period t-1 to t; YEAR_2006, YEAR_2007, YEAR_2008, YEAR_2009 are dummy variables equal 1 if the year is 2006, 2007, 2008 and 2009 respectively and otherwise 0. YEAR_2005 is the benchmark year. $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, from period t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of the equity-market value of firm i, time t; $LEVERAGE_{i,t-1}$ is debt-to-equity ratio of firm i, time t-1. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\ \_GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector.Goodwill-amortisation charges and goodwill-impairment losses take positive values in these regressions. Regression coefficients are unstandardised. t-statistics are given in parentheses.*indicates significant at 10% level (two-tailed), **indicates significant at 5 % level (two-tailed), *** indicates significant at 1% level (two-tailed). Observations having a value of Cook's distance larger than 4/n where n is total number of observations are classified as outliers.

Table A50 – Excluding 2008 observations – hypothesis 2d

		Stock return t			
		Main model		***Main model with control variables***	
		Available sample / Non-missing sample		*Available sample / Non-missing sample*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*
Intercept		0.006 (0.15)	0.010 (0.40)	-0.025 (-0.08)	-0.003 (-0.01)
$(E+GIM)_{i,t}$	+	2.069*** (3.91)	1.816*** (7.32)	1.677*** (3.23)	1.498*** (5.64)
$\Delta(E+GIM)_{i,t,t-1}$	+	-0.434 (-1.59)	-0.294 (-1.47)	-0.298 (-1.12)	-0.110 (-0.56)
$GAMC_{i,t}$		3.849*** (3.82)	2.513*** (3.91)	4.226*** (4.26)	2.664*** (3.95)
$\Delta GAMC_{i,t,t-1}$		1.228 (0.98)	0.781 (0.64)	1.161 (1.05)	0.951 (0.78)
$GIMC_{i,t}$	-	-1.801* (-1.86)	-1.442* (-1.91)	-1.837* (-1.81)	-1.938** (-2.28)
$\Delta GIMC_{i,t,t-1}$	-	-0.009 (-0.06)	-0.645* (-1.76)	0.020 (0.13)	-1.001** (-2.23)
$GROWTH\_SALES_{i,t}$				-0.010 (-0.31)	-0.024 (-0.39)
$lnSIZE\_MV_{i,t}$				0.008 (0.49)	0.008 (0.77)
$LEVERAGE_{i,t-1}$				$1.20*10^{-4}$*** (4.38)	$-4.87*10^{-4}$ (-0.76)
$RESOURCES_{i,t}$				0.227* (1.95)	0.062 (0.92)
$GENERAL\_INDUSTRIALS_{i,t}$				-0.120*** (-2.79)	-0.136*** (-3.57)
$CYCLICAL\_CONSUMER\_GOODS_{i,t}$				-0.226*** (-2.79)	-0.166** (-2.60)
$NON\text{-}CYCLICAL\_CONSUMER\_GOODS_{i,t}$				-0.154*** (-3.09)	-0.160*** (-3.61)
$CYCLICAL\_SERVICES_{i,t}$				-0.148*** (-3.60)	-0.167*** (-4.28)
$NON\_CYCLICAL\_SERVICES_{i,t}$				-0.164* (-1.87)	-0.180*** (-2.83)
$UTILITIES_{i,t}$				-0.137** (-2.55)	-0.143*** (-2.90)
$INFORMATION\_TECHNOLOGY_{i,t}$				-0.081 (-0.99)	-0.130** (-2.08)
$FINANCE_{i,t}$				-0.086 (-1.60)	-0.131** (-2.58)
N		615	578	615	580
F-value		12.30***	15.99***	9.32***	6.25***
Adjusted R^2		0.182	0.106	0.203	0.124
Max VIF		2.26	1.51	4.88	4.72
Mean VIF		1.58	1.26	2.05	1.90

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Stock return of firm i, period t, is dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; Δ $(E+GIM)_{i,t,t-1}$ is changes in pre-impairment net earnings of firm i from period t-1 to t; $GAMC_{i,t}$ is as-if accounted goodwill-amortisation charges under the amortisation-and-impairment method of firm i, period t; $\Delta GAMC_{i,t,t-1}$ is changes in as-if accounted goodwill-amortisation charges under the amortisation-and-impairment method of firm i from period t-1 to t; $GIMC_{i,t}$ is as-if accounted goodwill-impairment losses under the amortisation-and-impairment method of firm i, period t; $\Delta GIMC_{i,t,t-1}$ is changes in as-if accounted goodwill-impairment losses under the amortisation-and-impairment method of firm i from period t-1 to t; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, from period t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of the equity-market value of firm i, time t; $LEVERAGE_{i,t-1}$ is debt-to-equity ratio of firm i, time t-1. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector.Goodwill-amortisation charges and goodwill-impairment losses take positive values in these regressions. Regression coefficients are unstandardised. t-statistics are given in parentheses.*indicates significant at 10% level (two-tailed), **indicates significant at 5 % level (two-tailed), *** indicates significant at 1% level (two-tailed). Observations having a value of Cook's distance larger than 4/n where n is total number of observations are classified as outliers.

Table A51 – Excluding large book goodwill – hypothesis 2d

		Stock return t			
		Main model		***Main model with control variables***	
		Available sample / Non-missing sample		*Available sample / Non-missing sample*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*
Intercept		-0.060 (-1.17)	-0.034 (-1.28)	-1.300*** (-3.43)	-0.951*** (-3.25)
$(E+GIM)_{i,t}$	+	1.655*** (3.12)	1.269*** (5.87)	1.228** (2.53)	0.741*** (2.84)
$\Delta(E+GIM)_{i,t,t-1}$	+	-0.006 (-0.02)	0.546*** (3.28)	0.158 (0.56)	0.845*** (3.59)
$GAMC_{i,t}$		5.973** (2.21)	3.380** (2.14)	7.422** (2.60)	5.151*** (2.92)
$\Delta GAMC_{i,t,t-1}$		0.171 (0.27)	-1.065 (-0.64)	0.223 (0.29)	-1.072 (-0.66)
$GIMC_{i,t}$	-	-1.425*** (-3.14)	-2.038* (-1.75)	-1.420*** (-3.84)	-1.506 (-1.26)
$\Delta GIMC_{i,t,t-1}$	-	-0.242 (-0.06)	-1.500** (-2.16)	-0.252 (-1.01)	-1.403* (-1.78)
$GROWTH\_SALES_{i,t}$				0.019 (0.66)	-0.025 (-0.31)
$lnSIZE\_MV_{i,t}$				0.066*** (3.73)	0.052*** (3.81)
$LEVERAGE_{i,t-1}$				$1.16 \cdot 10^{-4}$*** (2.73)	-0.001** (-2.00)
$RESOURCES_{i,t}$				0.022 (0.23)	-0.077 (-1.04)
$GENERAL\_INDUSTRIALS_{i,t}$				-0.190*** (-4.20)	-0.191*** (-4.59)
$CYCLICAL\_CONSUMER\_GOODS_{i,t}$				-0.184*** (-2.64)	-0.130** (-2.28)
$NON\text{-}CYCLICAL\_CONSUMER\_GOODS_{i,t}$				-0.280*** (-5.50)	-0.278*** (-6.18)
$CYCLICAL\_SERVICES_{i,t}$				-0.136*** (-3.09)	-0.164*** (-3.93)
$NON\_CYCLICAL\_SERVICES_{i,t}$				-0.213*** (-2.68)	-0.213*** (-3.40)
$UTILITIES_{i,t}$				-0.212*** (-3.63)	-0.204*** (-4.04)
$INFORMATION\_TECHNOLOGY_{i,t}$				-0.091 (-1.18)	-0.271*** (-3.50)
$FINANCE_{i,t}$				-0.110** (-2.23)	-0.106** (-2.47)
N		559	530	559	530
F-value		4.81***	15.49***	5.40***	6.80***
Adjusted R^2		0.132	0.147	0.164	0.176
Max VIF		1.59	1.86	4.11	3.97
Mean VIF		1.31	1.48	1.83	1.88

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Stock return of firm i, period t, is dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $\Delta (E+GIM)_{i,t,t-1}$ is changes in pre-impairment net earnings of firm i from period t-1 to t; $GAMC_{i,t}$ is as-if accounted goodwill-amortisation charges under the amortisation-and-impairment method of firm i, period t; $\Delta GAMC_{i,t,t-1}$ is changes in as-if accounted goodwill-amortisation charges under the amortisation-and-impairment method of firm i from period t-1 to t; $GIMC_{i,t}$ is as-if accounted goodwill-impairment losses under the amortisation-and-impairment method of firm i, period t; $\Delta GIMC_{i,t,t-1}$ is changes in as-if accounted goodwill-impairment losses under the amortisation-and-impairment method of firm i from period t-1 to t; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, from period t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of the equity-market value of firm i, time t; $LEVERAGE_{i,t-1}$ is debt-to-equity ratio of firm i, time t-1. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector.Goodwill-amortisation charges and goodwill-impairment losses take positive values in these regressions. Regression coefficients are unstandardised. t-statistics are given in parentheses.*indicates significant at 10% level (two-tailed), **indicates significant at 5 % level (two-tailed), *** indicates significant at 1% level (two-tailed). Observations having a value of Cook's distance larger than 4/n where n is total number of observations are classified as outliers.

Table A52 – Excluding large goodwill impairment losses – hypothesis 2d

		Stock return t			
		Main model		***Main model with control variables***	
		Available sample / Non-missing sample		*Available sample / Non-missing sample*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*
Intercept		-0.084*	-0.060**	-1.012***	-0.657***
		(-1.85)	(-2.61)	(-3.19)	(-2.94)
$(E+GIM)_{i,t}$	+	2.040***	1.780***	1.655***	1.372***
		(3.63)	(7.15)	(3.11)	(5.72)
$\Delta(E+GIM)_{i,t,t-1}$		0.063	0.454***	0.234	0.563***
	+	(0.23)	(2.62)	(0.87)	(3.21)
$GAMC_{i,t}$		3.669**	1.817***	4.027***	1.855***
		(3.71)	(3.14)	(3.99)	(3.04)
$\Delta GAMC_{i,t,t-1}$		0.895	-3.861*	0.823	-3.543
		(0.67)	(-1.71)	(0.67)	(-1.38)
$GIMC_{i,t}$	-	5.531	-9.184	5.146	-8.957
		(0.99)	(-1.02)	(1.03)	(-1.45)
$\Delta GIMC_{i,t,t-1}$	-	-0.063	-0.895*	-0.050	-0.942*
		(-0.41)	(-1.79)	(-0.31)	(-1.83)
$GROWTH\_SALES_{i,t}$				0.019	0.024
				(0.75)	(0.38)
$lnSIZE\_MV_{i,t}$				0.051***	0.037***
				(3.42)	(3.52)
$LEVERAGE_{i,t-1}$				-0.001	$9.47*10^{-4}$*
				(-1.59)	(-1.84)
$RESOURCES_{i,t}$				0.052	-0.055
				(0.53)	(-0.62)
$GENERAL\_INDUSTRIALS_{i,t}$				-0.160***	-0.179***
				(-4.23)	(-5.57)
$CYCLICAL\_CONSUMER\_GOODS_{i,t}$				-0.164***	-0.098*
				(-2.65)	(-1.71)
$NON\text{-}CYCLICAL\_CONSUMER\_GOODS_{i,t}$				-0.225***	-0.210***
				(-5.48)	(-6.08)
$CYCLICAL\_SERVICES_{i,t}$				-0.167***	-0.172***
				(-4.60)	(-5.09)
$NON\_CYCLICAL\_SERVICES_{i,t}$				-0.180**	-0.188***
				(-2.31)	(-2.81)
$UTILITIES_{i,t}$				-0.220***	-0.209***
				(-4.03)	(-4.75)
$INFORMATION\_TECHNOLOGY_{i,t}$				-0.127	-0.137**
				(-1.53)	(-2.27)
$FINANCE_{i,t}$				-0.103**	-0.147***
				(-2.25)	(-3.55)
N		719	683	719	681
F-value		16.17***	24.10***	9.18***	8.87***
Adjusted R^2		0.155	0.143	0.175	0.159
Max VIF		2.25	1.45	4.93	4.80
Mean VIF		1.54	1.19	2.06	1.90

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Stock return of firm i, period t, is dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; Δ $(E+GIM)_{i,t,t-1}$ is changes in pre-impairment net earnings of firm i from period t-1 to t; $GAMC_{i,t}$ is as-if accounted goodwill-amortisation charges under the amortisation-and-impairment method of firm i, period t; $\Delta GAMC_{i,t,t-1}$ is changes in as-if accounted goodwill-amortisation charges under the amortisation-and-impairment method of firm i from period t-1 to t; $GIMC_{i,t}$ is as-if accounted goodwill-impairment losses under the amortisation-and-impairment method of firm i, period t; $\Delta GIMC_{i,t,t-1}$ is changes in as-if accounted goodwill-impairment losses under the amortisation-and-impairment method of firm i from period t-1 to t; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, from period t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of the equity-market value of firm i, time t; $LEVERAGE_{i,t-1}$ is debt-to-equity ratio of firm i, time t-1. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector.Goodwill-amortisation charges and goodwill-impairment losses take positive values in these regressions. Regression coefficients are unstandardised. t-statistics are given in parentheses.*indicates significant at 10% level (two-tailed), **indicates significant at 5 % level (two-tailed), *** indicates significant at 1% level (two-tailed). Observations having a value of Cook's distance larger than 4/n where n is total number of observations are classified as outliers.

Table A53 – Stock return measured with time lag t+2 months – hypothesis 2d

		Stock return t+2 months							
		Main model				***Main model with control variables***			
		Available sample		*Non-missing*		*Available sample*		*Non-missing*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*
Intercept		-0.020	-0.004	-0.020	-0.005	-0.762***	-0.776***	-0.761***	-0.774***
		(-0.72)	(-0.19)	(-0.74)	(-0.23)	(-2.79)	(-3.23)	(-2.79)	(-3.22)
$(E+GIM)_{i,t}$	+	1.083***	1.070***	1.091***	1.086***	0.790**	0.624***	0.798**	0.639***
		(3.16)	(4.52)	(3.18)	(4.58)	(2.37)	(2.64)	(2.38)	(2.70)
$\Delta(E+GIM)_{i,t,t-1}$		0.104	0.190	0.099	0.177	0.209	0.399**	0.204	0.387**
	+	(0.33)	(1.26)	(0.32)	(1.18)	(0.66)	(2.52)	(0.64)	(2.45)
$GAMC_{i,t}$		3.504***	1.560**	3.475***	1.506**	3.834***	2.240***	3.801***	2.181***
		(3.16)	(2.21)	(3.13)	(2.12)	(3.34)	(3.25)	(3.30)	(3.14)
$\Delta GAMC_{i,t,t-1}$		-1.605	-6.633**	-1.628	-6.752***	-1.776	-4.322**	-1.807	-4.404**
		(-0.87)	(-2.60)	(-0.88)	(-2.63)	(-0.99)	(-2.03)	(-1.00)	(-2.05)
$GIMC_{i,t}$	-	-1.311***	-1.596**	-1.305***	-1.585**	-1.269***	-1.363*	-1.263***	-1.336*
		(-3.19)	(-2.19)	(-3.20)	(-2.17)	(-3.13)	(-1.88)	(-3.13)	(-1.85)
$\Delta GIMC_{i,t,t-1}$	-	-0.086	-0.235	-0.087	-0.243	-0.078	-0.347	-0.079	-0.362
		(-0.44)	(-0.50)	(-0.44)	(-0.51)	(-0.39)	(-0.81)	(-0.39)	(-0.85)
$GROWTH\_SALES_{i,t}$						0.013	-0.082	0.014	-0.079
						(0.36)	(-1.22)	(0.37)	(-1.18)
$lnSIZE\_MV_{i,t}$						0.041***	0.044***	0.041***	0.044***
						(3.22)	(3.89)	(3.21)	(3.87)
$LEVERAGE_{i,t-1}$						$2.22*10^{-4}$***	-0.002*	$2.22*10^{-4}$***	-0.002*
						(4.27)	(-1.88)	(4.31)	(-1.84)
$RESOURCES_{i,t}$						0.074	0.081	0.074	0.080
						(0.86)	(0.83)	(0.85)	(0.81)
$GENERAL\_ INDUSTRIALS_{i,t}$						-0.127***	-0.126***	-0.127***	-0.125***
						(-2.95)	(-2.72)	(-2.95)	(-2.71)
$CYCLICAL\_ CONSUMER\_ GOODS_{i,t}$						-0.061	-0.130	-0.061	-0.129
						(-0.84)	(-1.37)	(-0.84)	(-1.36)
$NON\text{-}CYCLICAL\_ CONSUMER\_GOODS_{i,t}$						-0.205***	-0.211***	-0.205***	-0.210***
						(-4.38)	(-4.16)	(-4.38)	(-4.15)
$CYCLICAL\_SERVICES_{i,t}$						-0.140***	-0.151***	-0.140***	-0.151***
						(-3.34)	(-3.16)	(-3.34)	(-3.15)
$NON\_CYCLICAL\_ SERVICES_{i,t}$						-0.275***	-0.275***	-0.275***	-0.275***
						(-2.69)	(-5.07)	(-2.69)	(-5.07)
$UTILITIES_{i,t}$						-0.198***	-0.212***	-0.198***	-0.212***
						(-3.35)	(-3.69)	(-3.36)	(-3.70)
$INFORMATION\_ TECHNOLOGY_{i,t}$						-0.077	-0.191***	-0.076	-0.190***
						(-0.85)	(-2.82)	(-0.84)	(-2.79)
$FINANCE_{i,t}$						-0.103**	-0.119**	-0.108**	-0.125**
						(-2.07)	(-2.31)	(-2.12)	(-2.38)
N		763	729	762	728	763	719	762	718
F-value		19.56***	11.44***	19.58***	11.37***	10.74***	6.98***	10.79***	6.97***
Adjusted R^2		0.089	0.072	0.089	0.072	0.105	0.103	0.105	0.103
Max VIF		1.55	1.56	1.55	1.56	5.23	5.33	5.23	5.33
Mean VIF		1.40	1.40	1.41	1.40	2.05	2.09	2.05	2.09

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Stock return of firm i, period t+2 months, is dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $\Delta\,(E+GIM)_{i,t,t-1}$ is changes in pre-impairment net earnings of firm i from period t-1 to t; $GAMC_{i,t}$ is as-if accounted goodwill-amortisation charges under the amortisation-and-impairment method of firm i, period t; $\Delta GAMC_{i,t,t-1}$ is changes in as-if accounted goodwill-amortisation charges under the amortisation-and-impairment method of firm i from period t-1 to t; $GIMC_{i,t}$ is as-if accounted goodwill-impairment losses under the amortisation-and-impairment method of firm i, period t; $\Delta GIMC_{i,t,t-1}$ is changes in as-if accounted goodwill-impairment losses under the amortisation-and-impairment method of firm i from period t-1 to t; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, from period t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of the equity-market value of firm i, time t; $LEVERAGE_{i,t-1}$ is debt-to-equity ratio of firm i, time t-1. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\ \_GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector.Goodwill-amortisation charges and goodwill-impairment losses take positive values in these regressions. Regression coefficients are unstandardised. t-statistics are given in parentheses.*indicates significant at 10% level (two-tailed), **indicates significant at 5 % level (two-tailed), *** indicates significant at 1% level (two-tailed). Observations having a value of Cook's distance larger than 4/n where n is total number of observations are classified as outliers.

Table A54 – Stock return measured with time lag t+3 months – hypothesis 2d

		Stock return t+3 months							
		Main model				***Main model with control variables***			
		Available sample		*Non-missing*		*Available sample*		*Non-missing*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusiv e outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*
Intercept		0.001	-0.002	$-2.44*10^{-4}$	0.006	-0.766***	-0.891***	-0.763***	-0.885***
		(0.02)	(-0.09)	(-0.01)	(0.27)	(-2.87)	(-3.65)	(-2.87)	(-3.63)
(E+GIM)$_{i,t}$	+	0.899***	1.086***	0.909***	1.065***	0.631*	0.785***	0.642*	0.809***
		(2.76)	(4.89)	(2.79)	(4.84)	(1.93)	(3.12)	(1.96)	(3.22)
Δ(E+GIM)$_{i,t,t-1}$		0.173	0.217	0.167	0.190	0.262	0.307*	0.256	0.288*
	+	(0.52)	(1.46)	(0.50)	(1.28)	(0.76)	(1.83)	(0.74)	(1.73)
GAMC$_{i,t}$		3.412***	1.111	3.362***	0.866	3.657***	2.118***	3.599***	2.029***
		(2.70)	(1.51)	(2.66)	(1.16)	(2.77)	(2.78)	(2.72)	(2.70)
ΔGAMC$_{i,t,t-1}$		-0.626	-6.309**	-0.660	-7.005***	-0.803	-7.513***	-0.851	-7.715***
		(-0.42)	(-2.60)	(-0.45)	(-2.82)	(-0.53)	(-2.94)	(-0.57)	(-2.99)
GIMC$_{i,t}$	-	-1.056**	-0.191	-1.045**	-0.943	-1.021**	$7.51*10^{-4}$	-1.010**	0.036 (0.05)
		(-2.48)	(-0.28)	(-2.46)	(-1.22)	(-2.31)	(0.00)	(-2.29)	
ΔGIMC$_{i,t,t-1}$	-	-0.145	-0.385	-0.146	-0.576	-0.135	-0.678	-0.136	-0.694
		(-0.49)	(-0.56)	(-0.49)	(-0.85)	(-0.44)	(-1.00)	(-0.44)	(-1.02)
GROWTH(SALES)$_{i,t}$						-0.001	0.010	-0.001	0.015
						(-0.04)	(0.15)	(-0.02)	(0.23)
lnSIZE(MV)$_{i,t}$						0.043***	0.049***	0.043***	0.048***
						(3.39)	(4.21)	(3.38)	(4.19)
LEVERAGE$_{i,t-1}$						$2.66*10^{-4}$***	-0.001*	$2.67*10^{-4}$***	-0.001*
						(5.12)	(-1.95)	(5.19)	(-1.89)
RESOURCES$_{i,t}$						0.023	0.004	0.022	0.002
						(0.30)	(0.05)	(0.28)	(0.02)
GENERAL_ INDUSTRIALS$_{i,t}$						-0.143***	-0.127***	-0.143***	-0.126***
						(-3.20)	(-2.77)	(-3.20)	(-2.76)
CYCLICAL_ CONSUMER_ GOODS$_{i,t}$						-0.026	-0.013	-0.026	-0.013
						(-0.43)	(-0.17)	(-0.43)	(-0.17)
NON-CYCLICAL_ CONSUMER_GOODS$_{i,t}$						-0.244***	-0.227***	-0.244	-0.226***
						(-4.78)	(-4.48)	(-4.78)	(-4.47)
CYCLICAL_SERVICES$_{i,t}$						-0.160***	-0.163***	-0.159***	-0.162***
						(-3.67)	(-3.54)	(-3.66)	(-3.53)
NON_CYCLICAL_ SERVICES$_{i,t}$						-0.322***	-0.322***	-0.321***	-0.322***
						(-2.72)	(-5.81)	(-2.72)	(-5.81)
UTILITIES$_{i,t}$						-0.239***	-0.224***	-0.239***	-0.224***
						(-4.04)	(-3.92)	(-4.05)	(-3.93)
INFORMATION_ TECHNOLOGY$_{i,t}$						-0.078	-0.144*	-0.076	-0.142*
						(-0.86)	(-1.80)	(-0.84)	(-1.77)
FINANCE$_{i,t}$						-0.125**	-0.110**	-0.133***	-0.120**
						(-2.48)	(-2.09)	(-2.63)	(-2.30)
N		763	732	762	730	763	726	762	725
F-value		30.50***	16.28***	30.23***	12.33***	14.60***	7.46***	14.58***	7.31***
Adjusted R^2		0.089	0.077	0.088	0.078	0.105	0.122	0.105	0.123
Max VIF		1.90	10.31	1.90	1.65	5.22	14.33	5.22	14.34
Mean VIF		1.62	4.34	1.62	1.46	2.13	3.50	2.13	3.50

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Stock return of firm i, period t+3 months, is dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; Δ $(E+GIM)_{i,t,t-1}$ is changes in pre-impairment net earnings of firm i from period t-1 to t; $GAMC_{i,t}$ is as-if accounted goodwill-amortisation charges under the amortisation-and-impairment method of firm i, period t; $\Delta GAMC_{i,t,t-1}$ is changes in as-if accounted goodwill-amortisation charges under the amortisation-and-impairment method of firm i from period t-1 to t; $GIMC_{i,t}$ is as-if accounted goodwill-impairment losses under the amortisation-and-impairment method of firm i, period t; $\Delta GIMC_{i,t,t-1}$ is changes in as-if accounted goodwill-impairment losses under the amortisation-and-impairment method of firm i from period t-1 to t; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, from period t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of the equity-market value of firm i, time t; $LEVERAGE_{i,t-1}$ is debt-to-equity ratio of firm i, time t-1. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\ \_GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector.Goodwill-amortisation charges and goodwill-impairment losses take positive values in these regressions. Regression coefficients are unstandardised. t-statistics are given in parentheses.*indicates significant at 10% level (two-tailed), **indicates significant at 5 % level (two-tailed), *** indicates significant at 1% level (two-tailed). Observations having a value of Cook's distance larger than 4/n where n is total number of observations are classified as outliers.

Table A55 – Stock return measured with time lag t+4 months – hypothesis 2d

		Stock return t+4 months							
		Main model				***Main model with control variables***			
		Available sample		*Non-missing*		*Available sample*		*Non-missing*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*
Intercept		0.033 (1.27)	0.019 (0.91)	0.032 (1.24)	0.018 (0.84)	-0.590** (-2.57)	-0.802*** (-3.59)	-0.588** (-2.57)	-0.798*** (-3.59)
$(E+GIM)_{i,t}$	+	0.785*** (2.72)	1.054*** (4.58)	0.795*** (2.74)	1.074*** (4.64)	0.571** (2.02)	0.601*** (2.63)	0.580** (2.05)	0.622*** (2.73)
$\Delta(E+GIM)_{i,t,t-1}$	+	-0.018 (-0.08)	0.290* (1.66)	-0.024 (-0.11)	0.276 (1.58)	0.050 (0.22)	0.300** (2.44)	0.044 (0.19)	0.285** (2.33)
$GAMC_{i,t}$		2.033* (1.87)	0.367 (0.62)	1.995* (1.84)	0.308 (0.51)	2.128* (1.92)	1.236* (1.85)	2.083* (1.88)	1.170* (1.78)
$\Delta GAMC_{i,t,t-1}$		-0.522 (-0.54)	-1.597 (-1.36)	-0.543 (-0.56)	-1.641 (-1.42)	-0.676 (-0.70)	-6.825*** (-2.98)	-0.707 (-0.73)	-6.962*** (-3.01)
$GIMC_{i,t}$	-	-0.858** (-2.23)	-0.249 (-0.53)	-0.849** (-2.22)	-0.224 (-0.47)	-0.789** (-2.09)	-0.297 (-0.52)	-0.779** (-2.08)	-0.266 (-0.47)
$\Delta GIMC_{i,t,t-1}$	-	-0.031 (-0.11)	-0.292 (-0.62)	0.033 (-0.12)	-0.306 (-0.64)	-0.040 (-0.14)	-0.177 (-0.32)	-0.042 (-0.15)	-0.195 (-0.36)
$GROWTH\_SALES_{i,t}$						0.020 (0.82)	0.014 (0.22)	0.020 (0.85)	0.018 (0.28)
$lnSIZE\_MV_{i,t}$						0.036*** (3.26)	0.046*** (4.26)	0.036*** (3.26)	0.046*** (4.25)
$LEVERAGE_{i,t-1}$						$1.74*10^{-4}$*** (4.44)	-0.001 (-1.36)	$1.75*10^{-4}$*** (4.51)	-0.001 (-1.32)
$RESOURCES_{i,t}$						0.024 (0.31)	0.038 (0.47)	0.023 (0.30)	0.037 (0.44)
$GENERAL\_INDUSTRIALS_{i,t}$						-0.136** (-2.53)	-0.126** (-2.42)	-0.136** (-2.53)	-0.125** (-2.41)
$CYCLICAL\_CONSUMER\_GOODS_{i,t}$						0.055 (0.81)	0.069 (0.94)	0.055 (0.82)	0.068 (0.94)
$NON\text{-}CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-0.230*** (-4.01)	-0.232*** (-4.17)	-0.229*** (-4.01)	-0.231*** (-4.16)
$CYCLICAL\_SERVICES_{i,t}$						-0.145*** (-2.90)	-0.153*** (-3.07)	-0.145*** (-2.90)	-0.153*** (-3.06)
$NON\_CYCLICAL\_SERVICES_{i,t}$						-0.275** (-2.28)	-0.316*** (-5.19)	-0.275** (-2.28)	-0.316*** (-5.18)
$UTILITIES_{i,t}$						-0.210*** (-3.45)	-0.219*** (-3.63)	-0.210*** (-3.46)	-0.219*** (-3.64)
$INFORMATION\_TECHNOLOGY_{i,t}$						-0.013 (-0.14)	-0.109 (-1.52)	-0.011 (-0.13)	-0.108 (-1.49)
$FINANCE_{i,t}$						-0.116** (-2.06)	-0.128** (-2.25)	-0.123** (-2.18)	-0.137** (-2.42)
N		763	733	762	732	763	723	762	722
F-value		23.60***	19.71***	23.42***	19.45***	12.96***	8.59***	12.95***	8.48***
Adjusted R^2		0.039	0.066	0.039	0.067	0.059	0.103	0.059	0.104
Max VIF		2.20	10.44	2.20	10.45	5.23	15.92	5.23	15.93
Mean VIF		1.64	4.30	1.64	4.30	2.13	3.68	2.13	3.68

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Stock return of firm i, period t+4 months, is dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; Δ $(E+GIM)_{i,t,t-1}$ is changes in pre-impairment net earnings of firm i from period t-1 to t; $GAMC_{i,t}$ is as-if accounted goodwill-amortisation charges under the amortisation-and-impairment method of firm i, period t; $\Delta GAMC_{i,t,t-1}$ is changes in as-if accounted goodwill-amortisation charges under the amortisation-and-impairment method of firm i from period t-1 to t; $GIMC_{i,t}$ is as-if accounted goodwill-impairment losses under the amortisation-and-impairment method of firm i, period t; $\Delta GIMC_{i,t,t-1}$ is changes in as-if accounted goodwill-impairment losses under the amortisation-and-impairment method of firm i from period t-1 to t; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, from period t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of the equity-market value of firm i, time t; $LEVERAGE_{i,t-1}$ is debt-to-equity ratio of firm i, time t-1. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\ \_GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector.Goodwill-amortisation charges and goodwill-impairment losses take positive values in these regressions. Regression coefficients are unstandardised. t-statistics are given in parentheses.*indicates significant at 10% level (two-tailed), **indicates significant at 5 % level (two-tailed), *** indicates significant at 1% level (two-tailed). Observations having a value of Cook's distance larger than 4/n where n is total number of observations are classified as outliers.

Table A56 – Control for size – hypothesis 2d

		Unstandardised residuals t			
		Main model		***Main model with control variables***	
		Available sample / Non-missing sample		*Available sample / Non-missing sample*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*
Intercept		-0.185*** (-5.03)	-0.172*** (-7.55)	-0.278 (-0.93)	-0.103 (-0.44)
$(E+GIM)_{i,t}$	+	1.562*** (3.45)	1.362*** (5.82)	1.357*** (3.11)	1.166*** (5.06)
$\Delta(E+GIM)_{i,t,t-1}$	+	0.026 (0.10)	0.517*** (2.97)	0.102 (0.40)	0.462*** (2.74)
$GAMC_{i,t}$		3.254*** (3.36)	1.642*** (2.94)	3.440*** (3.61)	1.987*** (3.37)
$\Delta GAMC_{i,t,t-1}$		0.513 (0.41)	-3.228* (-1.73)	0.454 (0.38)	-0.380 (-0.49)
$GIMC_{i,t}$	-	-1.515*** (-3.70)	-3.206*** (-4.12)	-1.501*** (-3.59)	-2.206** (-2.50)
$\Delta GIMC_{i,t,t-1}$	-	-0.122 (-0.90)	-0.094 (-0.63)	-0.111 (-0.79)	-0.322* (-1.73)
$GROWTH\_SALES_{i,t}$				0.005 (0.16)	-0.034 (-0.57)
$lnSIZE\_MV_{i,t}$				0 .012 (0.83)	0.005 (0.48)
$LEVERAGE_{i,t-1}$				$1.27*10^{-4}$*** (3.50)	$-9.05*10^{-4}$ (-1.23)
$RESOURCES_{i,t}$				0.033 (0.36)	-0.049 (-0.55)
$GENERAL\_INDUSTRIALS_{i,t}$				-0.165*** (-4.37)	-0.183*** (-5.64)
$CYCLICAL\_CONSUMER\_GOODS_{i,t}$				-0.151*** (-2.47)	-0.107** (-2.28)
$NON\text{-}CYCLICAL\_CONSUMER\_GOODS_{i,t}$				-0.223*** (-5.22)	-0.217*** (-5.72)
$CYCLICAL\_SERVICES_{i,t}$				-0.164*** (-4.56)	-0.176*** (-4.98)
$NON\_CYCLICAL\_SERVICES_{i,t}$				-0.262*** (-3.07)	-0.205*** (-3.27)
$UTILITIES_{i,t}$				-0.239*** (-4.07)	-0.215*** (-4.67)
$INFORMATION\_TECHNOLOGY_{i,t}$				-0.105 (-1.40)	-0.154*** (-2.73)
$FINANCE_{i,t}$				-0.097** (-2.18)	-0.134*** (-3.23)
N		762	725	762	724
F-value		24.18***	19.08***	13.35***	7.68***
Adjusted R^2		0.142	0.138	0.148	0.126
Max VIF		2.36	1.55	5.21	5.06
Mean VIF		1.66	1.31	2.14	1.95

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The dependent variable is unstandardised residuals from a regression of stock returns on size where size is measured as natural logarithm of equity-market value at the end of the fiscal year. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; Δ $(E+GIM)_{i,t,t-1}$ is changes in pre-impairment net earnings of firm i from period t-1 to t; $GAMC_{i,t}$ is as-if accounted goodwill-amortisation charges under the amortisation-and-impairment method of firm i, period t; $\Delta GAMC_{i,t,t-1}$ is changes in as-if accounted goodwill-amortisation charges under the amortisation-and-impairment method of firm i from period t-1 to t; $GIMC_{i,t}$ is as-if accounted goodwill-impairment losses under the amortisation-and-impairment method of firm i, period t; $\Delta GIMC_{i,t,t-1}$ is changes in as-if accounted goodwill-impairment losses under the amortisation-and-impairment method of firm i from period t-1 to t; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, from period t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of the equity-market value of firm i, time t; $LEVERAGE_{i,t-1}$ is debt-to-equity ratio of firm i, time t-1. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\ \_GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector.Goodwill-amortisation charges and goodwill-impairment losses take positive values in these regressions. Regression coefficients are unstandardised. t-statistics are given in parentheses.*indicates significant at 10% level (two-tailed), **indicates significant at 5 % level (two-tailed), *** indicates significant at 1% level (two-tailed). Observations having a value of Cook's distance larger than 4/n where n is total number of observations are classified as outliers.

Table A57 – No impairment and amortisation – price-book-earnings regressions

		Stock price t							
		Main model				***Main model with control variables***			
		Available sample		*Non-missing*		*Available sample*		*Non-missing*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*
Intercept		3.100***	2.121***	2.907***	1.983***	-18.590***	-14.399***	-20.027***	-14.227***
		(7.98)	(9.04)	(5.93)	(8.30)	(-3.04)	(-3.53)	(-2.83)	(-3.21)
$(E+GIM)_{i,t}$	+	2.628***	4.143***	3.108***	4.819***	2.022***	3.400***	2.405**	3.774***
		(4.32)	(9.07)	(3.08)	(8.86)	(3.50)	(7.78)	(2.33)	(7.12)
$(EQ\text{-}GW)_{i,t-1}$	+	0.789***	0.712***	0.774***	0.619***	0.726***	0.679***	0.693***	0.669***
		(5.21)	(11.55)	(2.90)	(6.24)	(4.83)	(12.37)	(2.87)	(7.45)
$GW\_NO_{i,t-1}$	+	0.800***	0.992***	0.783***	0.859***	0.738***	0.686***	0.703***	0.675***
		(5.27)	(5.09)	(2.94)	(4.76)	(4.93)	(12.42)	(2.92)	(7.49)
$GROWTH\_SALES_{i,t}$						0.696**	1.114***	0.623**	1.331***
						(2.40)	(2.67)	(2.09)	(2.98)
$lnSIZE\_MV_{i,t}$						1.166***	0.878***	1.238***	0.876***
						(3.98)	(4.48)	(3.68)	(4.09)
$RESOURCES_{i,t}$						-3.189	-2.188**	-3.619	-2.471*
						(-1.27)	(-2.03)	(-1.16)	(-1.84)
$GENERAL\_INDUSTRIALS_{i,t}$						-2.357*	-1.270*	-2.733*	-1.737**
						(-1.80)	(-1.89)	(-1.92)	(-2.07)
$CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-3.828***	-2.853***	-3.946***	-3.082***
						(-2.72)	(-4.00)	(-2.70)	(-3.55)
$NON\text{-}CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-0.891	-0.491	-1.021	-0.757
						(-0.52)	(-0.59)	(-0.54)	(-0.74)
$CYCLICAL\_SERVICES_{i,t}$						-3.332**	-2.029***	-3.504**	-2.284***
						(-2.44)	(-2.92)	(-2.35)	(-2.66)
$NON\_CYCLICAL\_SERVICES_{i,t}$						-6.258***	-4.633***	-8.142***	-4.808***
						(-3.33)	(-5.34)	(-4.39)	(-4.54)
$UTILITIES_{i,t}$						-4.648***	-2.747***	-5.008***	-3.137**
						(-2.81)	(-2.76)	(-2.75)	(-2.60)
$INFORMATION\_TECHNOLOGY_{i,t}$						-3.928***	-2.706***	-4.346***	-3.088***
						(-2.74)	(-3.46)	(-2.84)	(-3.32)
$FINANCE_{i,t}$						-3.434**	-1.817**	-3.147**	-1.977**
						(-2.34)	(-2.47)	(-2.06)	(-2.17)
N		909	859	762	722	909	857	762	725
F-value		21.86***	101.34***	17.93***	82.98***	9.43***	44.01***	9.64***	27.38***
Adjusted R^2		0.449	0.541	0.438	0.553	0.525	0.616	0.512	0.619
Max VIF		21.19	1.17	35.67	1.33	24.40	22.06	38.80	38.58
Mean VIF		14.51	1.14	24.21	1.25	5.57	5.30	7.62	7.62

Stock price of firm i, time t, is dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $GW\_NO_{i,t-1}$ is book goodwill without any deduction for amortisation charges or impairment losses (during the period investigated) of firm i, period t-1; $(EQ\text{-}GW))_{i,t-1}$ is book equity reduced by book goodwill without any deduction for amortisation charges or impairment losses (during the period investigated) of firm i, time t-1; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, from period t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of market value of firm i, time t; $LEVERAGE_{i,t-1}$ is debt-to-equity ratio of firm i, time t-1. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\ \_GOODS_{i,t}$, NON_CYCLICAL _CONSUMER_GOODS$_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, INFORMATION_ TECHNOLOGY$_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector. Regression coefficients are unstandardised. t-statistics are given in parentheses. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). Observations having a value of Cook's distance larger than 4/n where n is total number of observations are classified as outliers.

Table A58 – No impairment and amortisation – return-earnings regressions

		Stock return t							
		Main model				***Main model with control variables***			
		Available sample		*Non-missing*		*Available sample*		*Non-missing*	
Test variables	*Pred.*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*	*Inclusive outliers*	*Exclusive outliers*
Intercept		0.004 (0.10)	-0.024 (-1.51)	-0.009 (-0.24)	-0.031* (-1.78)	-0.706*** (-2.87)	-0.838*** (-3.61)	-1.059*** (-3.67)	-0.944*** (-3.73)
$(E+GIM)_{i,t}$	+	1.689*** (3.24)	1.501*** (8.44)	1.765*** (3.73)	1.566*** (8.15)	1.554*** (2.91)	1.285 *** (5.86)	1.483*** (3.17)	1.154*** (4.87)
$\Delta(E+GIM)_{i,t,t-1}$	+	-0.432 (-0.94)	0.063 (0.38)	-0.066 (-0.25)	0.495*** (3.07)	-0.388 (-0.81)	0.087 (0.49)	0.036 (0.13)	0.595*** (3.27)
$GROWTH\_SALES_{i,t}$						0.035 (1.09)	0.020 (1.00)	0.007 (0.24)	-0.032 (-0.53)
$lnSIZE\_MV_{i,t}$						0.040*** (3.35)	0.047*** (4.27)	0.056*** (4.07)	0.052*** (4.33)
$LEVERAGE_{i,t-1}$						$1.11*10^{-4}$*** (3.98)	$-7.36*10^{-4}$ (-1.07)	$1.01*10^{-4}$*** (3.41)	$-8.30*10^{-4}$ (-1.11)
$RESOURCES_{i,t}$						-0.059 (-0.69)	-0.168** (-2.36)	-0.008 (-0.08)	-0.071 (-0.76)
$GENERAL\_INDUSTRIALS_{i,t}$						-0.133*** (-3.22)	-0.165*** (-4.47)	-0.147*** (-4.15)	-0.167*** (-5.37)
$CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-0.152*** (-2.82)	-0.116*** (-2.94)	-0.138*** (-3.19)	-0.111*** (-2.93)
$NON\text{-}CYCLICAL\_CONSUMER\_GOODS_{i,t}$						-0.200*** (-4.74)	-0.220*** (-5.58)	-0.217*** (-5.43)	-0.225*** (-5.95)
$CYCLICAL\_SERVICES_{i,t}$						-0.166*** (-4.63)	-0.200*** (-5.54)	-0.138*** (-4.10)	-0.171*** (-4.98)
$NON\_CYCLICAL\_SERVICES_{i,t}$						-0.223*** (-2.95)	-0.262*** (-3.41)	-0.308*** (-3.37)	-0.298*** (-6.17)
$UTILITIES_{i,t}$						-0.197*** (-4.20)	-0.227*** (-4.88)	-0.244*** (-4.99)	-0.239*** (-5.08)
$INFORMATION\_TECHNOLOGY_{i,t}$						-0.030 (-0.36)	-0.165*** (-2.67)	-0.014 (-0.15)	-0.141** (-2.29)
$FINANCE_{i,t}$						-0.110** (-2.61)	-0.153*** (-4.03)	-0.087** (-2.20)	-0.123*** (-3.22)
N		895	852	762	721	895	862	762	726
F-value		10.09***	68.02***	9.73***	63.11***	7.91***	12.31***	8.20***	11.16***
Adjusted R^2		0.094	0.109	0.091	0.116	0.102	0.123	0.108	0.135
Max VIF		1.68	1.90	1.51	1.60	5.23	5.10	5.17	5.03
Mean VIF		1.68	1.90	1.51	1.60	2.31	2.28	2.23	2.16

Stock return of firm i, period t, is dependent variable. $(E+GIM)_{i,t}$ is pre-impairment net earnings of firm i, period t; $\Delta (E+GIM)_{i,t,t-1}$ is changes in pre-impairment net earnings of firm i from period t-1 to t; $GROWTH\_SALES_{i,t}$ is growth in total sales of firm i, from period t-1 to t; $lnSIZE\_MV_{i,t}$ is natural logarithm of market value of firm i, time t; $LEVERAGE_{i,t-1}$ is debt-to-equity ratio of firm i, time t-1. $RESOURCES_{i,t}$, $GENERAL\_INDUSTRIALS_{i,t}$, $CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $NON\_CYCLICAL\_CONSUMER\_GOODS_{i,t}$, $CYCLICAL\_SERVICES_{i,t}$, NON_CYCLICAL_SERVICES, $UTILITIES_{i,t}$, $INFORMATION\_TECHNOLOGY_{i,t}$, $FINANCE_{i,t}$ are all industry-sector dummies which equal 1 if the firm belongs to the sector and otherwise 0. BASIC_INDUSTRIES is used as benchmark-industry sector. Regression coefficients are unstandardised. t-statistics are given in parentheses. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). Observations having a value of Cook's distance larger than 4/n where n is total number of observations are classified as outliers.

Table A59 – Value relevance of goodwill reported under alternative accounting methods – hypotheses 2e and 2f (time lag 2 months)

	Price-book-earnings regressions (Stock price t)					*Return-earnings regressions (Stock return t)*				
	Adjusted R^2		***Difference in Adjusted R^2***	***Vuong Z-statistics***	***Bootstrapped Z-statistics***	***Adjusted R^2***		***Difference in Adjusted R^2***	***Vuong Z-statistics***	***Bootstrapped Z-statistics***
	Model 1	***Model 2***				***Model 1***	***Model 2***			
Impairment-only method versus permanent-retention method	0.467	0.437	0.030	1.757*	1.570	0.063	0.046	0.017	1.948*	1.770*
Amortisation-only method versus permanent-retention method	0.468	0.437	0.031	1.868*	1.910*	0.103	0.046	0.057	2.862***	2.680***
Amortisation-and-impairment method versus permanent-retention method	0.478	0.437	0.041	2.214**	2.050**	0.089	0.046	0.043	2.577**	2.180**
Amortisation-only method versus impairment-only method	0.468	0.467	0.001	0.054	0.050	0.103	0.063	0.040	1.893*	1.890*
Amortisation-and-impairment method versus impairment-only method	0.490	0.467	0.023	0.817	1.250	0.089	0.063	0.026	1.601	1.330
Amortisation-and-impairment method versus amortisation-only method	0.490	0.468	0.022	0.707	0.710	0.089	0.103	-0.014	-0.845	-0.900

*indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed).

Permanent-retention method reports no goodwill-amortisation charges and goodwill-impairment losses.

Table A60 – Value relevance of goodwill reported under alternative accounting methods – hypotheses 2e and 2f (time lag 3 months)

	Price-book-earnings regressions (Stock price t)					*Return-earnings regressions (Stock return t)*				
	Adjusted R^2		*Difference in Adjusted R^2*	*Vuong Z-statistics*	*Bootstrapped Z-statistics*	*Adjusted R^2*		*Difference in Adjusted R^2*	*Vuong Z-statistics*	*Bootstrapped Z-statistics*
	Model 1	***Model 2***				***Model 1***	***Model 2***			
Impairment-only method versus permanent-retention method	0.473	0.437	0.036	2.021**	1.850*	0.065	0.049	0.016	0.975	0.830
Amortisation-only method versus permanent-retention method	0.475	0.437	0.038	2.026**	1.870*	0.063	0.049	0.014	1.033	0.710
Amortisation-and-impairment method versus permanent-retention method	0.482	0.437	0.045	2.322**	2.150**	0.088	0.049	0.039	2.088**	1.660*
Amortisation-only method versus impairment-only method	0.475	0.473	0.002	0.110	0.110	0.063	0.065	-0.002	-0.112	-0.100
Amortisation-and-impairment method versus impairment-only method	0.482	0.473	0.009	1.222	1.100	0.088	0.065	0.023	1.533	1.280
Amortisation-and-impairment method versus amortisation-only method	0.482	0.475	0.007	0.635	0.590	0.088	0.063	0.025	1.668*	1.300

*indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed).

Permanent-retention method reports no goodwill-amortisation charges and goodwill-impairment losses.

Table A61 – Value relevance of goodwill reported under alternative accounting methods – hypotheses 2e and 2f (time lag 4 months)

	Price-book-earnings regressions (Stock price t)					*Return-earnings regressions (Stock return t)*				
	Adjusted R^2		*Difference in Adjusted R^2*	*Vuong Z-statistics*	*Bootstrapped Z-statistics*	*Adjusted R^2*		*Difference in Adjusted R^2*	*Vuong Z-statistics*	*Bootstrapped Z-statistics*
	Model 1	*Model 2*				*Model 1*	*Model 2*			
Impairment-only method versus permanent-retention method	0.477	0.447	0.030	1.934*	1.770*	0.031	0.022	0.009	1.558	1.110
Amortisation-only method versus permanent-retention method	0.482	0.447	0.035	2.059**	1.900*	0.023	0.022	0.001	0.567	0.060
Amortisation-and-impairment method versus permanent-retention method	0.488	0.447	0.041	2.277**	2.090**	0.039	0.022	0.017	1.788*	1.160
Amortisation-only method versus impairment-only method	0.482	0.477	0.005	0.355	0.340	0.023	0.031	-0.008	-0.870	-0.730
Amortisation-and-impairment method versus impairment-only method	0.488	0.477	0.011	1.232	1.100	0.039	0.031	0.008	1.030	0.680
Amortisation-and-impairment method versus amortisation-only method	0.488	0.482	0.006	0.676	0.600	0.039	0.023	0.016	1.659*	1.310

*indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed).

Permanent-retention method reports no goodwill-amortisation charges and goodwill-impairment losses.

Table A62 – Value relevance of goodwill reported under alternative accounting methods – hypothesis 2e – Scaled by total assets t-1 or total sales t

	Market value scaled by total assets t-1					*Market value scaled by total sales t*				
	Adjusted R^2		*Difference in Adjusted R^2*	*Vuong Z-statistics*	*Bootstrapped Z-statistics*	*Adjusted R^2*		*Difference in Adjusted R^2*	*Vuong Z-statistics*	*Bootstrapped Z-statistics*
	Model 1	***Model 2***				***Model 1***	***Model 2***			
Impairment-only method versus permanent-retention method	0.355	0.341	0.014	1.626	1.350	0.587	0.558	0.029	2.232**	2.200 **
Amortisation-only method versus permanent-retention method	0.427	0.341	0.086	1.915*	2.260*	0.634	0.558	0.076	2.000**	1.910*
Amortisation-and-impairment method versus permanent-retention method	0.434	0.341	0.093	2.148**	2.380**	0.653	0.558	0.095	2.576**	2.560**
Amortisation-only method versus impairment-only method	0.427	0.355	0.072	1.553	1.800*	0.634	0.587	0.047	1.279	1.310
Amortisation-and-impairment method versus impairment-only method	0.434	0.355	0.079	1.795*	2.150**	0.653	0.587	0.066	1.900*	1.910*
Amortisation-and-impairment method versus amortisation-only method	0.434	0.427	0.007	1.633	1.120	0.653	0.634	0.019	2.974***	2.650***

*indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed).

Permanent-retention method reports no goodwill-amortisation charges and goodwill-impairment losses.

Table A63 – Value relevance of goodwill reported under alternative accounting methods – hypotheses 2e and 2f – Control for size

	Price-book-earnings regressions (unstandardised residuals t)					*Return-earnings regressions (unstandardised residuals t)*				
	Adjusted R^2		*Difference in Adjusted R^2*	*Vuong Z-statistics*	*Bootstrapped Z-statistics*	*Adjusted R^2*		*Difference in Adjusted R^2*	*Vuong Z-statistics*	*Bootstrapped Z-statistics*
	Model 1	*Model 2*				*Model 1*	*Model 2*			
Impairment-only method versus permanent-retention method	0.347	0.316	0.031	1.617	1.530	0.124	0.083	0.041	1.735*	1.760*
Amortisation-only method versus permanent-retention method	0.346	0.316	0.030	1.669*	1.620	0.121	0.083	0.038	1.484	1.470
Amortisation-and-impairment method versus permanent-retention method	0.357	0.316	0.041	1.940*	1.830*	0.142	0.083	0.059	2.285**	2.200**
Amortisation-only method versus impairment-only method	0.346	0.347	-0.001	-0.050	-0.050	0.121	0.124	-0.003	-0.168	-0.160
Amortisation-and-impairment method versus impairment-only method	0.357	0.347	0.010	1.212	1.110	0.142	0.124	0.018	1.362	1.150
Amortisation-and-impairment method versus amortisation-only method	0.357	0.346	0.011	0.707	0.640	0.142	0.121	0.021	1.786*	1.590

*indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed).

Permanent-retention method reports no goodwill-amortisation charges and goodwill-impairment losses.

Appendix B – Research question 3 and 4

Table B1 – Excluding 2008 observations – hypotheses 3c to 3al[40]

		Impairment decision				***Size of impairment losses***			
		Economic		*Economic and EM*		*Economic*		*Economic and EM*	
Test variables	*Pred*	*Non-winsorised*	*Winsorised*	*Non-winsorised*	*Winsorised*	*Non-winsorised*	*Winsorised*	*Non-winsorised*	*Winsorised*
Intercept		-2.051***	-2.036***	-6.623***	-6.066***	-0.065***	-0.016***	-0.087**	-0.046***
		(-15.02)	(-12.42)	(-4.39)	(-2.96)	(-4.77)	(-9.57)	(-2.08)	(-3.09)
ΔUNEMPLOY%$_{i,t,t-1}$	+	0.197	0.201	0.265*	0.269*	0.005*	0.002**	0.006**	0.003***
		(1.60)	(1.48)	(1.80)	(1.80)	(1.93)	(2.51)	(2.14)	(2.98)
ΔINDROA$_{i,t,t-1}$	-	-1.462	5.324	-4.352	-3.530	0.076	0.061	-0.030	$-2.29*10^{-4}$
		(-0.19)	(0.51)	(-0.47)	(-0.29)	(0.64)	(1.05)	(-0.28)	(-0.00)
RET$_{i,t}$	-	-0.500*	-0.582*	-0.721***	-0.644*	-0.012*	-0.005**	-0.015***	-0.006***
		(-2.22)	(-1.85)	(-2.83)	(-1.92)	(-1.95)	(-2.33)	(-2.68)	(-3.04)
ΔSALES%$_{i,t,t-1}$	-	-0.00579	-0.011**	-0.015***	-0.013**	$-1.24*10^{-4}$	$-6.95*10^{-5}$**	$-3.63*10^{-4}$***	$-9.11*10^{-5}$**
		(-1.56)	(-2.09)	(-2.88)	(-2.06)	(-1.13)	(-1.98)	(-2.78)	(-2.25)
ΔROA$_{i,t,t-1}$	-	0.610	0.891	-0.393	-0.064	0.023	0.012	-0.002	0.004
		(0.64)	(0.41)	(-0.25)	(-0.02)	(0.80)	(0.82)	(-0.06)	(0.16)
ΔOCF%$_{i,t,t-1}$	-	$-5.37*10^{-5}$	-0.001	$-3.77*10^{-5}$	-0.002	$-1.71*10^{-6}$	$-1.14*10^{-5}$	$-8.83*10^{-7}$	$-1.62*10^{-5}$*
		(-0.88)	(-0.94)	(-0.70)	(-1.30)	(-0.87)	(-1.34)	(-0.78)	(-1.71)
BM$_{i,t}$	+	0.150	-0.101	0.239**	0.094	0.003	$-2.10*10^{-4}$	0.003**	$1.10*10^{-4}$
		(1.29)	(-0.32)	(2.16)	(0.26)	(1.38)	(-0.10)	(1.99)	(0.05)
HIST$_{i,t}$	+	2.006***	2.019***	2.156***	2.113***	0.035***	0.012***	0.032***	0.012***
		(9.67)	(9.53)	(8.72)	(8.21)	(4.81)	(7.33)	(4.99)	(7.34)
COB_BON$_{i,t}$	-			0.881	0.709			0.021	0.008
				(1.04)	(0.50)			(1.56)	(1.00)
CEO_BON$_{i,t}$	-			0.237	1.897			0.002	0.014**
				(0.93)	(1.52)			(1.15)	(2.00)
CFO_BON$_{i,t}$	-			-0.730	-2.603*			-0.026*	-0.020**
				(-1.04)	(-1.90)			(-1.82)	(-2.55)
COB_COSTOCK$_{i,t}$	-			-0.181	0.950			-0.005	-0.008
				(-0.55)	(0.47)			(-0.71)	(-0.70)
CEO_COSTOCK$_{i,t}$	-			0.002***	-0.020			$1.34*10^{-5}$***	$-9.54*10^{-5}$
				(3.29)	(-0.56)			(4.03)	(-0.52)
CFO_COSTOCK$_{i,t}$	-			-0.004	-0.010			$-4.73*10^{-5}$	$1.30*10^{-5}$
				(-0.92)	(-0.70)			(-1.30)	(0.16)
COB_OPTION$_{i,t}$	-			-0.196*	-0.493			-0.004	$1.33*10^{-4}$
				(-1.72)	(-0.63)			(-1.52)	(0.03)
CEO_OPTION$_{i,t}$	-			0.003	0.005			$2.92*10^{-5}$	$2.73*10^{-5}$
				(1.29)	(0.24)			(1.36)	(0.18)
CFO_OPTION$_{i,t}$	-			0.002	0.003			$6.21*10^{-5}$*	$7.75*10^{-5}$
				(1.45)	(0.28)			(1.89)	(1.28)
BATH$_{i,t}$	-			4.284	-1.831			0.077	-0.017
				(1.55)	(-0.30)			(1.54)	(-0.44)
SMOOTH$_{i,t}$	+			0.366	0.369			0.010*	0.003
				(1.34)	(1.17)			(1.94)	(1.40)
ΔCOB$_{i,t}$	+			-0.587	-0.460			-0.006	-0.002
				(-1.50)	(-1.21)			(-1.04)	(-1.06)
ΔCEO$_{i,t}$	+			-0.130	-0.117			0.002	0.001
				(-0.34)	(-0.30)			(0.43)	(0.41)
ΔCFO$_{i,t}$	+			0.129	0.023			0.002	-0.001
				(0.35)	(0.06)			(0.32)	(-0.27)
DEBT$_{i,t}$	-			0.011	0.119**			0.0001*	$4.34*10^{-4}$*
				(1.36)	(2.52)			(1.65)	(1.74)
lnSIZE_MV$_{i,t}$	+			0.156*	0.188**			0.003	0.001
				(1.80)	(2.00)			(1.42)	(1.42)

Table continues on next page.

[40] No test results are provided for hypotheses 3a and 3b, 3g and 3h, 3aa and 3ab.

Table continues from previous page.								
N	832	832	678	678	832	832	678	678
Log-likelihood	-475.347	-357.912	-273.414	-279.840	128.433	303.722	155.130	271.216
Wald Chi2-test	120.55***	124.89***	135.82***	145.85***	3.58***	9.19***	2.65***	4.02***
Pseudo R^2	0.148	0.148	0.211	0.193	-0.637	-0.217	-0.884	-0.305
Max VIF	1.22	1.36	1.83	4.07	1.22	1.36	1.83	4.07
Mean VIF	1.08	1.18	1.21	1.73	1.08	1.18	1.21	1.73

$IMP\_DECISION_{i,t}$ equals 1 if firm i reports goodwill-impairment losses for period t; otherwise 0; $IMP\_AMOUNT_{i,t}$ is reported goodwill-impairment losses (a positive amount) of firm i, period t, scaled by total assets at time t-1; $\Delta UNEMPLOY\%_{i,t,t-1}$ is average-monthly percentage changes in unemployment rates from period t-1 to t; $\Delta INDROA_{i,t,t-1}$ is median changes in industry-sector pre-impairment return-on-assets from period t-1 to t where industry-sector is defined according to FTSE codes to which firm i belongs; $RET_{i,t}$ is stock returns of firm i, period t; $\Delta SALES\%_{i,t,t-1}$ is percentage changes in total sales of firm i, from period t-1 to t; $\Delta ROA_{i,t,t-1}$ is changes in pre-impairment return-on-assets of firm i, from period t-1 to t; $\Delta OCF\%_{i,t,t-1}$ is percentage changes in operating cash flows of firm i, from period t-1 to t; $BM_{i,t}$ is pre-impairment book-to-market ratios of firm i, time t; $HIST_{i,t}$ equals 1 if goodwill-impairment losses are reported for firm i, period t-1; otherwise 0; $COB\_BON_{i,t}$ is cash-bonus payment to COB of firm i period t, scaled by total cash compensation to COB period t; $CEO\_BON_{i,t}$ is cash-bonus payment to CEO of firm i period t, scaled by total cash compensation to CEO period t; $CFO\_BON_{i,t}$ is cash-bonus payment to CFO of firm i period t, scaled by total cash compensation to CFO period t; $COB\_COSTOCK_{i,t}$ is number of conditional stocks held by COB of firm i time t, scaled by number of common stocks held by COB at time t; $CEO\_COSTOCK_{i,t}$ is number of conditional stocks held by CEO of firm i time t, scaled by number of common stocks held by CEO at time t; $CFO\_COSTOCK_{i,t}$ is number of conditional stocks held by CFO of firm i time t, scaled by number of common stocks held by CFO at time t; $COB\_OPT_{i,t}$ is number of executive stock options held by COB of firm i time t, scaled by number of common stocks held by COB at time t; $CEO\_OPT_{i,t}$ is number of executive stock options held by CEO of firm i time t, scaled by number of common stocks held by CEO at time t; $CFO\_OPT_{i,t}$ is number of executive stock options held by CFO of firm i time t, scaled by number of common stocks held by CFO at time t; $BATH_{i,t}$ is changes in pre-impairment earnings of firm i from period t-1 to t, scaled by total assets at time t-1, when below the median of nonzero negative values of this variable; otherwise 0; $SMOOTH_{i,t}$ is changes in pre-impairment earnings of firm i from period t-1 to t, scaled by total assets at time t-1, when above the median of nonzero positive values of this variable; otherwise 0; $\Delta COB_{i,t}$ equals 1 if firm i changes COB in period t; otherwise 0; $\Delta CEO_{i,t}$ equals 1 if firm i changes CEO in period t; otherwise 0; $\Delta CFO_{i,t}$ equals 1 if firm i changes CFO in period t; otherwise 0; $DEBT_{i,t}$ is pre-impairment debt-to-equity ratio of firm i, period t; $lnSIZE\_MV_{i,t}$ is natural logarithm of equity-market value of firm i time t. t-statistics are given in parentheses. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). To investigate the effect of outliers, all the continuous variables are winsorised at 5th and 95th percentile.

Table B2 – Excluding large goodwill-impairment losses – hypotheses 3c to 3al[41]

		Impairment decision				Size of impairment losses			
		Economic		Economic and EM		Economic		Economic and EM	
Test variables	*Pred*	*Non-winsorised*	*Winsorised*	*Non-winsorised*	*Winsorised*	*Non-winsorised*	*Winsorised*	*Non-winsorised*	*Winsorised*
Intercept		-2.177***	-2.137***	-6.847***	-7.722***	-0.065***	-0.010***	-3.878***	-0.046***
		(-14.61)	(-11.52)	(-3.87)	(-3.87)	(-4.77)	(-8.47)	(-3.13)	(-3.09)
$\Delta UNEMPLOY\%_{i,t,t-1}$	+	-0.046	-0.045	0.058	0.015	$-4.57*10^{-5}$	$-1.19*10^{-5}$	0.001	$3.74*10^{-4}$
		(-0.38)	(-0.36)	(0.42)	(0.10)	(-0.09)	(-0.02)	(1.02)	(0.71)
$\Delta INDROA_{i,t,t-1}$	-	-12.689**	-7.025	-12.550**	-5.652	-0.048**	-0.042	-0.035*	-0.017
		(-2.27)	(-0.81)	(-2.03)	(-0.57)	(-2.23)	(-1.19)	(-1.69)	(-0.48)
$RET_{i,t}$	-	-0.409**	-0.500*	-0.452**	-0.395	-0.002**	-0.003**	-0.003***	-0.003**
		(-2.30)	(-1.93)	(-1.99)	(-1.30)	(-2.12)	(-2.15)	(-2.89)	(-2.58)
$\Delta SALES\%_{i,t,t-1}$	-	-0.003	-0.006	-0.003	-0.005	$-1.79*10^{-5}$	$-3.36*10^{-5}$*	$-1.01*10^{-5}$	$-2.15*10^{-5}$
		(-0.87)	(-1.17)	(-0.67)	(-0.80)	(-1.06)	(-1.65)	(-0.62)	(-1.06)
$\Delta ROA_{i,t,t-1}$	-	0.273	-0.467	0.118	0.612	0.002	0.004	$1.73*10^{-4}$	$4.15*10^{-5}$
		(0.29)	(-0.24)	(0.09)	(0.15)	(0.67)	(0.55)	(0.03)	(0.00)
$\Delta OCF\%_{i,t,t-1}$	-	$-1.83*10^{-4}$	-0.002	$-1.34*10^{-4}$*	-0.003*	$-2.72*10^{-7}$***	$-7.67*10^{-6}$	$-3.03*10^{-7}$***	$-1.10*10^{-5}$*
		(-0.74)	(-1.52)	(-1.68)	(-1.70)	(-6.65)	(-1.32)	(-5.38)	(-1.65)
$BM_{i,t}$	+	0.238**	0.376	0.319***	0.656**	0.001**	0.002	0.001**	0.002
		(2.55)	(1.43)	(2.91)	(1.96)	(2.25)	(1.45)	(2.50)	(1.47)
$HIST_{i,t}$	+	2.146***	2.102***	2.148***	2.070***	0.008***	0.008***	0.008***	0.008***
		(10.57)	(10.20)	(9.23)	(8.86)	(7.86)	(7.78)	(7.44)	(7.13)
$COB\_BON_{i,t}$	-			1.547**	2.109			0.008**	0.011**
				(2.18)	(1.63)			(2.47)	(1.98)
$CEO\_BON_{i,t}$	-			0.217	1.763			$4.71*10^{-4}$	0.006
				(0.92)	(1.46)			(0.97)	(1.35)
$CFO\_BON_{i,t}$	-			-0.888	-2.448*			-0.005**	-0.011**
				(-1.30)	(-1.83)			(-2.03)	(-2.11)
$COB\_COSTOCK_{i,t}$	-			-0.355	0.473			-0.002*	-0.003
				(-1.20)	(0.30)			(-1.71)	(-0.46)
$CEO\_COSTOCK_{i,t}$	-			$3.97*10^{-5}$	0.002			$4.44*10^{-7}$**	$2.66*10^{-5}$
				(0.80)	(0.05)			(2.01)	(0.25)
$CFO\_COSTOCK_{i,t}$	-			-0.014*	-0.027*			$-4.41*10^{-5}$	$-8.10*10^{-5}$
				(-1.70)	(-1.68)			(-1.49)	(-1.36)
$COB\_OPTION_{i,t}$	-			-0.124**	-0.390			$-5.32*10^{-4}$**	-0.001
				(-1.97)	(-0.59)			(-2.13)	(-0.37)
$CEO\_OPTION_{i,t}$	-			0.002	-0.024			$6.45*10^{-6}$*	$-1.01*10^{-4}$
				(0.93)	(-1.02)			(1.66)	(-1.20)
$CFO\_OPTION_{i,t}$	-			-0.003	$2.68*10^{-4}$			$-1.09*10^{-5}$	$5.93*10^{-6}$
				(-0.59)	(0.02)			(-0.64)	(0.14)
$BATH_{i,t}$	-			-0.554	-6.753			$1.28*10^{-4}$	-0.012
				(-0.26)	(-1.20)			(0.02)	(-0.58)
$SMOOTH_{i,t}$	+			0.233	0.245			0.001	0.001
				(0.87)	(0.75)			(1.26)	(1.04)
$\Delta COB_{i,t}$	+			-0.581	-0.444			-0.002	-0.001
				(-1.54)	(-1.22)			(-1.62)	(-1.12)
$\Delta CEO_{i,t}$	+			0.235	0.300			0.002	0.002
				(0.72)	(0.88)			(1.52)	(1.52)
$\Delta CFO_{i,t}$	+			0.145	0.021			$3.01*10^{-4}$	$-2.06*10^{-4}$
				(0.44)	(0.06)			(0.27)	(-0.18)
$DEBT_{i,t}$	-			0.004	0.132***			$-3.64*10^{-7}$	$2.87*10^{-4}$*
				(0.41)	(2.69)			(-0.02)	(1.91)
$lnSIZE\_MV_{i,t}$	+			0.226***	0.249***			0.001**	$7.65*10^{-4}$**
				(2.79)	(2.82)			(2.49)	(2.41)

Table continues on next page.

[41] No test results are provided for hypotheses 3a and 3b, 3g and 3h, 3aa and 3ab.

Table continues from previous page.								
N	1013	1013	824	824	1013	1013	824	824
Log-likelihood	-404.290	-357.912	-273.414	-313.975	398.830	393.975	347.534	340.299
Wald Chi2-test	136.22***	134.07***	182.19***	168.86***	37.37***	9.43***	20.97***	3.81***
Pseudo R^2	0.155	0.145	0.197	0.191	-0.193	-0.178	-0.262	-0.236
Max VIF	1.28	1.47	1.85	4.50	1.28	1.47	4.07	4.50
Mean VIF	1.11	1.23	1.24	1.79	1.11	1.23	1.73	1.79

$IMP\_DECISION_{i,t}$ equals 1 if firm i reports goodwill-impairment losses for period t; otherwise 0; $IMP\_AMOUNT_{i,t}$ is reported goodwill-impairment losses (a positive amount) of firm i, period t, scaled by total assets at time t-1; $\Delta UNEMPLOY\%_{i,t,t-1}$ is average-monthly percentage changes in unemployment rates from period t-1 to t; $\Delta INDROA_{i,t,t-1}$ is median changes in industry-sector pre-impairment return-on-assets from period t-1 to t where industry-sector is defined according to FTSE codes to which firm i belongs; $RET_{i,t}$ is stock returns of firm i, period t; $\Delta SALES\%_{i,t,t-1}$ is percentage changes in total sales of firm i, from period t-1 to t; $\Delta ROA_{i,t,t-1}$ is changes in pre-impairment return-on-assets of firm i, from period t-1 to t; $\Delta OCF\%_{i,t,t-1}$ is percentage changes in operating cash flows of firm i, from period t-1 to t; $BM_{i,t}$ is pre-impairment book-to-market ratios of firm i, time t; $HIST_{i,t}$ equals 1 if goodwill-impairment losses are reported for firm i, period t-1; otherwise 0; $COB\_BON_{i,t}$ is cash-bonus payment to COB of firm i period t, scaled by total cash compensation to COB period t; $CEO\_BON_{i,t}$ is cash-bonus payment to CEO of firm i period t, scaled by total cash compensation to CEO period t; $CFO\_BON_{i,t}$ is cash-bonus payment to CFO of firm i period t, scaled by total cash compensation to CFO period t; $COB\_COSTOCK_{i,t}$ is number of conditional stocks held by COB of firm i time t, scaled by number of common stocks held by COB at time t; $CEO\_COSTOCK_{i,t}$ is number of conditional stocks held by CEO of firm i time t, scaled by number of common stocks held by CEO at time t; $CFO\_COSTOCK_{i,t}$ is number of conditional stocks held by CFO of firm i time t, scaled by number of common stocks held by CFO at time t; $COB\_OPT_{i,t}$ is number of executive stock options held by COB of firm i time t, scaled by number of common stocks held by COB at time t; $CEO\_OPT_{i,t}$ is number of executive stock options held by CEO of firm i time t, scaled by number of common stocks held by CEO at time t; $CFO\_OPT_{i,t}$ is number of executive stock options held by CFO of firm i time t, scaled by number of common stocks held by CFO at time t; $BATH_{i,t}$ is changes in pre-impairment earnings of firm i from period t-1 to t, scaled by total assets at time t-1, when below the median of nonzero negative values of this variable; otherwise 0; $SMOOTH_{i,t}$ is changes in pre-impairment earnings of firm i from period t-1 to t, scaled by total assets at time t-1, when above the median of nonzero positive values of this variable; otherwise 0; $\Delta COB_{i,t}$ equals 1 if firm i changes COB in period t; otherwise 0; $\Delta CEO_{i,t}$ equals 1 if firm i changes CEO in period t; otherwise 0; $\Delta CFO_{i,t}$ equals 1 if firm i changes CFO in period t; otherwise 0; $DEBT_{i,t}$ is pre-impairment debt-to-equity ratio of firm i, period t; $lnSIZE\_MV_{i,t}$ is natural logarithm of equity-market value of firm i time t. t-statistics are given in parentheses. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). To investigate the effect of outliers, all the continuous variables are winsorised at 5th and 95th percentile.

Table B3 – Changes in cash-bonus payments – hypotheses 3c to 3al[42]

		Impairment decision				Size of impairment losses			
		Economic		Economic and EM		Economic		Economic and EM	
Test variables	*Pred*	*Non-winsorised*	*Winsorised*	*Non-winsorised*	*Winsorised*	*Non-winsorised*	*Winsorised*	*Non-winsorised*	*Winsorised*
Intercept		-2.051***	-2.036***	-5.154***	-6.204***	-0.065***	-0.016***	-0.132***	-0.0337**
		(-15.02)	(-12.42)	(-3.48)	(-3.73)	(-4.77)	(-9.57)	(-3.50)	(-2.94)
$\Delta UNEMPLOY\%_{i,t,t-1}$	+	0.177	0.155	0.285**	0.230	0.006**	0.002**	0.007**	0.003**
		(1.54)	(1.29)	(2.04)	(1.62)	(2.03)	(2.18)	(2.58)	(2.45)
$\Delta INDROA_{i,t,t-1}$	-	-9.646*	-4.949	-9.995*	-7.073	-0.154	-0.029	-0.112	-0.045
		(-1.91)	(-0.65)	(-1.73)	(-0.81)	(-1.21)	(-0.58)	(-1.27)	(-0.88)
$RET_{i,t}$	-	-0.698***	-0.875***	-0.722***	-0.652**	-0.024***	-0.008***	-0.018***	-0.006***
		(-3.42)	(-3.44)	(-3.03)	(-2.29)	(-2.93)	(-4.05)	(-3.34)	(-3.40)
$\Delta SALES\%_{i,t,t-1}$	-	$-1.99*10^{-4}$	-0.006	-0.006	-0.007	$-3.31*10^{-5}$	$-5.02*10^{-5}$	$-1.79*10^{-4}$**	$-6.46*10^{-5}$*
		(-0.68)	(-1.24)	(-1.33)	(-1.25)	(-0.38)	(-1.45)	(-1.97)	(-1.80)
$\Delta ROA_{i,t,t-1}$	-	0.171	-0.455	0.189	2.113	0.015	0.004	0.005	0.012
		(0.18)	(-0.26)	(0.16)	(0.57)	(0.50)	(0.31)	(0.20)	(0.52)
$\Delta OCF\%_{i,t,t-1}$	-	$-1.53*10^{-4}$	-0.002	$-1.08*10^{-4}$**	-0.002	$-7.67*10^{-7}$**	$-1.00*10^{-5}$	$-4.88*10^{-7}$**	$-1.31*10^{-5}$
		(-0.91)	(-1.41)	(-1.98)	(-1.51)	(-2.63)	(-1.17)	(-2.34)	(-1.41)
$BM_{i,t}$	+	0.323***	0.554*	0.426***	0.853***	0.010***	0.005***	0.008***	0.006***
		(2.93)	(2.45)	(3.53)	(3.16)	(3.19)	(2.82)	(3.02)	(3.10)
$HIST_{i,t}$	+	2.064***	2.014***	2.147***	2.052***	0.049***	0.012***	0.034***	0.012***
		(10.46)	(10.04)	(9.35)	(8.82)	(4.19)	(8.22)	(5.98)	(7.74)
$\Delta COB\_BON_{i,t,t-1}$	-			0.132	0.197			0.003	0.013
				(0.71)	(0.05)			(1.08)	(0.59)
$\Delta CEO\_BON_{i,t,t-1}$	-			0.230	0.689			$7.80*10^{-4}$*	0.004
				(1.06)	(1.43)			(1.80)	(1.57)
$\Delta CFO\_BON_{i,t,t-1}$	-			-0.238	-1.340**			-0.005	-0.011***
				(-0.87)	(-2.39)			(-1.29)	(-3.05)
$COB\_COSTOCK_{i,t}$	-			-0.365	-0.361			-0.005	-0.012
				(-1.21)	(-0.21)			(-0.62)	(-1.00)
$CEO\_COSTOCK_{i,t}$	-			$1.30*10^{-5}$	0.004			$1.71*10^{-7}$	$4.43*10^{-5}$
				(0.35)	(0.13)			(0.17)	(0.24)
$CFO\_COSTOCK_{i,t}$	-			-0.003	-0.018			$-8.73*10^{-5}$**	$-7.01*10^{-5}$
				(-0.94)	(-1.48)			(-2.39)	(-0.84)
$COB\_OPTION_{i,t}$	-			-0.135	0.043			-0.006	0.002
				(-1.43)	(0.06)			(-1.15)	(0.35)
$CEO\_OPTION_{i,t}$	-			0.003	-0.017			$2.96*10^{-5}$*	$-1.05*10^{-4}$
				(1.29)	(-0.80)			(1.77)	(-0.70)
$CFO\_OPTION_{i,t}$	-			0.002**	0.010			$8.54*10^{-5}$***	$1.09*10^{-4}$*
				(2.10)	(1.16)			(3.18)	(1.73)
$BATH_{i,t}$	-			-0.185	-6.403			0.009	-0.027
				(-0.10)	(-1.24)			(0.29)	(-0.80)
$SMOOTH_{i,t}$	+			0.277	0.188			0.008*	0.002
				(1.17)	(0.64)			(1.72)	(1.06)
$\Delta COB_{i,t}$	+			-0.570*	-0.509			-0.009	-0.003*
				(-1.65)	(-1.57)			(-1.62)	(-1.75)
$\Delta CEO_{i,t}$	+			0.417	0.444			0.008*	0.004**
				(1.41)	(1.43)			(1.88)	(2.13)
$\Delta CFO_{i,t}$	+			-0.012	-0.297			$-3.64*10^{-4}$	-0.003
				(-0.04)	(-0.87)			(-0.06)	(-1.15)
$DEBT_{i,t}$	-			0.005	0.120***			$6.90*10^{-5}$	$5.59*10^{-4}$**
				(0.62)	(2.77)			(0.87)	(2.14)
$lnSIZE\_MV_{i,t}$	+			0.138**	0.170**			0.002	$7.04*10^{-4}$
				(2.07)	(2.32)			(1.34)	(1.46)

Table continues on next page.

[42] No test results are provided for hypotheses 3a and 3b, 3g and 3h, 3aa and 3ab.

Table continues from previous page.								
N	1068	1068	868	868	1068	1068	868	868
Log-likelihood	-475.347	-481.598	-365.90	-372.739	122.079	408.981	187.668	357.544
Wald Chi2-test	149.35***	154.43***	185.53***	167.91***	3.28***	13.97***	3.82***	4.91***
Pseudo R^2	0.161	0.149	0.202	0.187	-1.929	-0.226	-1.261	-0.300
Max VIF	1.29	1.51	1.86	3.72	1.29	1.51	1.86	3.72
Mean VIF	1.11	1.24	1.24	1.61	1.11	1.24	1.24	1.61

$IMP\_DECISION_{i,t}$ equals 1 if firm i reports goodwill-impairment losses for period t; otherwise 0; $IMP\_AMOUNT_{i,t}$ is reported goodwill-impairment losses (a positive amount) of firm i, period t, scaled by total assets at time t-1; $\Delta UNEMPLOY\%_{i,t,t-1}$ is average-monthly percentage changes in unemployment rates from period t-1 to t; $\Delta INDROA_{i,t,t-1}$ is median changes in industry-sector pre-impairment return-on-assets from period t-1 to t where industry-sector is defined according to FTSE codes to which firm i belongs; $RET_{i,t}$ is stock returns of firm i, period t; $\Delta SALES\%_{i,t,t-1}$ is percentage changes in total sales of firm i, from period t-1 to t; $\Delta ROA_{i,t,t-1}$ is changes in pre-impairment return-on-assets of firm i, from period t-1 to t; $\Delta OCF\%_{i,t,t-1}$ is percentage changes in operating cash flows of firm i, from period t-1 to t; $BM_{i,t}$ is pre-impairment book-to-market ratios of firm i, time t; $HIST_{i,t}$ equals 1 if goodwill-impairment losses are reported for firm i, period t-1; otherwise 0;); $\Delta COB\_BON_{i,t,t-1}$ is changes in cash bonus payments to COB of firm i from period t-1 to t, scaled by total cash compensation to COB period t; $\Delta CEO\_BON_{i,t,t-1}$ is changes in cash bonus payment to CEO of firm i from period t-1 to t, scaled by total cash compensation to CEO period t; $\Delta CFO\_BON_{i,t,t-1}$ is changes in cash bonus payment to CFO of firm i from period t-1 to t, scaled by total cash compensation to CFO period t; $COB\_COSTOCK_{i,t}$ is number of conditional stocks held by COB of firm i time t, scaled by number of common stocks held by COB at time t; $CEO\_COSTOCK_{i,t}$ is number of conditional stocks held by CEO of firm i time t, scaled by number of common stocks held by CEO at time t; $CFO\_COSTOCK_{i,t}$ is number of conditional stocks held by CFO of firm i time t, scaled by number of common stocks held by CFO at time t; $COB\_OPT_{i,t}$ is number of executive stock options held by COB of firm i time t, scaled by number of common stocks held by COB at time t; $CEO\_OPT_{i,t}$ is number of executive stock options held by CEO of firm i time t, scaled by number of common stocks held by CEO at time t; $CFO\_OPT_{i,t}$ is number of executive stock options held by CFO of firm i time t, scaled by number of common stocks held by CFO at time t; $BATH_{i,t}$ is changes in pre-impairment earnings of firm i from period t-1 to t, scaled by total assets at time t-1, when below the median of nonzero negative values of this variable; otherwise 0; $SMOOTH_{i,t}$ is changes in pre-impairment earnings of firm i from period t-1 to t, scaled by total assets at time t-1, when above the median of nonzero positive values of this variable; otherwise 0; $\Delta COB_{i,t}$ equals 1 if firm i changes COB in period t; otherwise 0; $\Delta CEO_{i,t}$ equals 1 if firm i changes CEO in period t; otherwise 0; $\Delta CFO_{i,t}$ equals 1 if firm i changes CFO in period t; otherwise 0; $DEBT_{i,t}$ is pre-impairment debt-to-equity ratio of firm i, period t; $lnSIZE\_MV_{i,t}$ is natural logarithm of equity-market value of firm i time t. t-statistics are given in parentheses. *indicates significance at 10% level (two-tailed), **indicates significance at 5 % level (two-tailed), *** indicates significance at 1% level (two-tailed). To investigate the effect of outliers, all the continuous variables are winsorised at 5^{th} and 95^{th} percentile.

Table B4 – Excluding 2008 observations – hypotheses 4a to 4al[43]

Understated impairment losses

Test variables	*Pred*	Earnings management: *Non-winsorised*	Earnings management: *Winsorised*	Earnings management and corporate governance: *Non-winsorised*	Earnings management and corporate governance: *Winsorised*
Intercept		0.004	0.003**	0.009**	0.004**
		(1.21)	(2.23)	(2.09)	(2.27)
$COB\_BON_{i,t}$	-	0.002	$7.86*10^{-4}$	0.001	0.001
		(1.04)	(0.79)	(0.75)	(1.37)
$CEO\_BON_{i,t}$	-	$-6.34*10^{-5}$	$2.12*10^{-4}$	$-5.57*10^{-5}$	$-1.47*10^{-4}$
		(-0.20)	(0.24)	(-0.17)	(-0.16)
$CFO\_BON_{i,t}$	-	$-8.62*10^{-4}$	$-8.37*10^{-4}$	$-8.63*10^{-4}$	$-5.96*10^{-4}$
		(-1.30)	(-0.93)	(-1.23)	(-0.66)
$COB\_COSTOCK_{i,t}$	-	$1.15*10^{-4}$	$6.73*10^{-4}$	$2.34*10^{-5}$	$-8.49*10^{-5}$
		(0.50)	(0.46)	(0.10)	(-0.05)
$CEO\_COSTOCK_{i,t}$	-	$8.08*10^{-5}$*	$4.61*10^{-5}$**	$5.68*10^{-5}$	$2.16*10^{-5}$
		(1.96)	(2.05)	(1.51)	(0.97)
$CFO\_COSTOCK_{i,t}$	-	$3.88*10^{-7}$	$-8.08*10^{-6}$	$6.19*10^{-7}$	$-9.53*10^{-7}$
		(1.20)	(-1.05)	(1.34)	(-0.11)
$COB\_OPTION_{i,t}$	-	$-8.61*10^{-5}$	$-3.48*10^{-6}$	$-4.99*10^{-5}$	$-9.72*10^{-6}$
		(-1.07)	(-0.01)	(-0.57)	(-0.02)
$CEO\_OPTION_{i,t}$	-	$-2.53*10^{-5}$***	$-2.06*10^{-5}$	$-2.74*10^{-5}$***	$-3.86*10^{-6}$
		(-2.71)	(-1.38)	(-2.65)	(-0.23)
$CFO\_OPTION_{i,t}$	-	$1.22*10^{-6}$	$3.76*10^{-6}$	$4.29*10^{-7}$	$-5.89*10^{-6}$
		(0.73)	(0.69)	(0.38)	(-0.95)

Overstated impairment losses

Test variables	*Pred*	Earnings management: *Non-winsorised*	Earnings management: *Winsorised*	Earnings management and corporate governance: *Non-winsorised*	Earnings management and corporate governance: *Winsorised*
Intercept		-0.018**	-0.011**	-0.006	-0.002
		(-1.98)	(-2.53)	(-0.66)	(-0.34)
$COB\_BON_{i,t}$	-	0.003	0.00	0.004	0.003
		(1.40)	(0.85)	(1.46)	(1.08)
$CEO\_BON_{i,t}$	-	$7.13*10^{-4}$**	0.004*	$4.73*10^{-4}$	0.004
		(2.23)	(1.72)	(1.62)	(1.47)
$CFO\_BON_{i,t}$	-	-0.006**	-0.007**	-0.007**	-0.00661**
		(-2.02)	(-2.59)	(-2.31)	(-2.48)
$COB\_COSTOCK_{i,t}$	-	$-9.59*10^{-4}$	$-9.30*10^{-4}$	$-7.45*10^{-4}$	$6.14*10^{-4}$
		(-1.00)	(-0.23)	(-0.70)	(0.17)
$CEO\_COSTOCK_{i,t}$	-	$1.46*10^{-6}$**	$6.39*10^{-6}$	$-1.92*10^{-5}$	$-5.70*10^{-5}$
		(2.43)	(0.13)	(-0.56)	(-1.00)
$CFO\_COSTOCK_{i,t}$	-	$-9.18*10^{-6}$	$-1.50*10^{-5}$	$-8.11*10^{-6}$	$-1.21*10^{-6}$
		(-1.31)	(-0.70)	(-1.28)	(-0.05)
$COB\_OPTION_{i,t}$	-	$-4.69*10^{-4}$	$-2.76*10^{-4}$	$-6.45*10^{-4}$	-0.001
		(-1.13)	(-0.19)	(-1.28)	(-0.96)
$CEO\_OPTION_{i,t}$	-	$2.87*10^{-6}$	$-1.26*10^{-5}$	$-1.42*10^{-6}$	$-5.02*10^{-5}$
		(0.77)	(-0.31)	(-0.14)	(-1.11)
$CFO\_OPTION_{i,t}$	-	$7.56*10^{-6}$	$2.38*10^{-5}$	$6.61*10^{-6}$	$3.56*10^{-5}$*
		(1.23)	(1.30)	(1.31)	(1.83)

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[43] No test results are provided for hypotheses 4g and 4h.

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Test variables	Pred	Understated impairment losses: Earnings management, Non-winsorised	Understated: Earnings management, Winsorised	Understated: Earnings management and corporate governance, Non-winsorised	Understated: Earnings management and corporate governance, Winsorised	Pred	Overstated impairment losses: Earnings management, Non-winsorised	Overstated: Earnings management, Winsorised	Overstated: Earnings management and corporate governance, Non-winsorised	Overstated: Earnings management and corporate governance, Winsorised
$BATH_{i,t}$	-	0.004	0.002	0.002	$9.74*10^{-4}$	-	-0.008	-0.016**	-0.006	-0.013*
		(0.87)	(0.71)	(0.54)	(0.31)		(-1.00)	(-2.20)	(-0.77)	(-1.82)
$SMOOTH_{i,t}$	+	-0.001**	$-4.02*10^{-4}$***	-0.001**	$-2.55*10^{-4}$	+	$1.27*10^{-4}$	$1.22*10^{-4}$	$-1.85*10^{-4}$	$-9.07*10^{-5}$
		(-2.29)	(-2.72)	(-2.06)	(-1.60)		(0.21)	(0.32)	(-0.31)	(-0.23)
$\Delta COB_{i,t}$	+	-0.000583	$-2.08*10^{-4}$	$-5.96*10^{-4}$	$-1.84*10^{-4}$	+	$-2.66*10^{-4}$	$-9.57*10^{-6}$	-0.001	$-3.99*10^{-4}$
		(-1.14)	(-1.11)	(-1.09)	(-1.00)		(-0.31)	(-0.02)	(-1.38)	(-0.72)
$\Delta CEO_{i,t}$	+	0.000343	$5.78*10^{-5}$	$6.29*10^{-4}$	$-6.10*10^{-6}$	+	$3.12*10^{-4}$	$2.26*10^{-5}$	$6.74*10^{-4}$	$2.93*10^{-4}$
		(0.61)	(0.30)	(0.90)	(-0.03)		(0.32)	(0.04)	(0.73)	(0.56)
$\Delta CFO_{i,t}$	+	-0.000155	$-9.56*10^{-6}$	$-3.59*10^{-4}$	$-9.31*10^{-5}$	+	$7.33*10^{-4}$	$2.25*10^{-4}$	$9.16*10^{-4}$	$3.50*10^{-4}$
		(-0.28)	(-0.05)	(-0.61)	(-0.42)		(0.89)	(0.47)	(1.07)	(0.69)
$DEBT_{i,t}$	-	-0.00000730	$1.77*10^{-5}$	$2.74*10^{-6}$	$5.35*10^{-5}$	-	$2.44*10^{-5}$*	$1.62*10^{-4}$**	$3.50*10^{-5}$**	$1.85*10^{-4}$**
		(-0.82)	(0.52)	(0.45)	(1.57)		(1.92)	(2.44)	(2.35)	(2.92)
$lnSIZE\_MV_{i,t}$	+	0.0000417	$-2.82*10^{-5}$	$-9.23*10^{-5}$	$-6.25*10^{-5}$	+	$6.85*10^{-4}$	$3.69*10^{-4}$*	$-1.06*10^{-4}$	$-2.32*10^{-4}$
		(0.28)	(-0.43)	(-0.42)	(-0.69)		(1.60)	(1.89)	(-0.21)	(-0.79)
$lnBOARD\_SIZE_{i,t}$	+			$-8.30*10^{-4}$	$-2.90*10^{-4}$	-			0.002	0.002
				(-0.77)	(-0.63)				(0.76)	(1.55)
$NONEXE_{i,t}$	+			$4.94*10^{-4}$	$1.91*10^{-4}$	-			$2.85*10^{-4}$	$7.52*10^{-4}$
				(0.24)	(0.24)				(0.09)	(0.35)
$lnBOARD\_MEET_{i,t}$	+			$4.67*10^{-4}$	$1.08*10^{-4}$	-			$5.23*10^{-4}$	-0.002
				(0.71)	(0.27)				(0.46)	(-1.61)
$COB\_STOCK_{i,t}$	+			-0.002	-0.003	-			0.002	-0.002
				(-0.57)	(-1.04)				(0.29)	(-0.13)
$CEO\_STOCK_{i,t}$	+			-0.003	-0.004	-			-0.010	-0.010
				(-1.27)	(-1.58)				(-1.40)	(-1.00)
$CFO\_STOCK_{i,t}$	+			-0.014	-0.066	-			-0.054	-0.053
				(-0.48)	(-0.93)				(-0.76)	(-0.20)
$ACCEXP_{i,t}$	+			$-1.38*10^{-4}$	$-1.29*10^{-4}$	-			$8.81*10^{-5}$	$-1.56*10^{-4}$
				(-0.28)	(-0.69)				(0.11)	(-0.33)
$lnAUDIT\_SIZE_{i,t}$	+			$1.31*10^{-4}$	$4.62*10^{-5}$	-			-0.002	$4.86*10^{-4}$
				(0.14)	(0.18)				(-0.93)	(0.58)
$lnAUDIT\_MEET_{i,t}$	+			-0.001*	$-4.77*10^{-4}$*	-			0.003**	0.002*
				(-1.64)	(-1.71)				(2.04)	(1.73)

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		Understated impairment losses					Overstated impairment losses			
		Earnings management		*Earnings management and corporate governance*			*Earnings management*		*Earnings management and corporate governance*	
Test variables	*Pred*	*Non-winsorised*	*Winsorised*	*Non-winsorised*	*Winsorised*	*Pred*	*Non-winsorised*	*Winsorised*	*Non-winsorised*	*Winsorised*
$BLOCK\%_{i,t}$	+			$1.65*10^{-5}$ (1.11)	$4.78*10^{-6}$ (0.73)	-			$4.04*10^{-7}$ (0.02)	$1.23*10^{-6}$ (0.07)
$lnBLOCK\_NUM_{i,t}$	+			$-5.49*10^{-4}$ (-1.05)	$-3.88*10^{-5}$ (-0.19)	-			$-6.47*10^{-4}$ (-0.91)	$-4.76*10^{-4}$ (-1.03)
$CROSS_{i,t}$	+			0.002** (2.28)	$6.64*10^{-4}$* (1.83)	-			0.002* (1.77)	0.002** (1.98)
N		704	704	628	628		678	678	605	605
Log-likelihood		175.195	234.683	152.495	210.105		326.752	386.375	314.119	363.021
Wald Chi2-test		2.70***	1.36	1.30	1.24		4.09***	1.60*	1.42*	1.92***
Pseudo R^2		-0.078	-0.040	-0.095	-0.062		-0.057	-0.059	-0.091	-0.081
Max VIF		1.90	3.78	2.86	3.89		1.90	3.78	2.86	3.89
Mean VIF		1.18	1.66	1.54	1.70		1.18	1.66	1.54	1.70

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Understated impairment losses (AB_IMP_NEG) equal negative abnormal impairment losses equals negative differences between reported impairment losses period *t* scaled by total assets at time t-1 and estimated normal (expected) impairment losses of firm i period t. If the estimated normal (expected) impairment losses are negative, they are censored at zero. Overstated impairment losses (AB_IMP_POS) equal positive differences between reported impairment losses period *t* scaled by total assets at time t-1 and estimated normal (expected) impairment losses of firm i period t. If the estimated normal (expected) impairment losses are negative, they are censored at zero. $COB\_BON_{i,t}$ is cash-bonus payment to COB of firm i period t, scaled by total cash compensation to COB period t; $CEO\_BON_{i,t}$ is cash-bonus payment to CEO of firm i period t, scaled by total cash compensation to CEO period t; $CFO\_BON_{i,t}$ is cash-bonus payment to CFO of firm i period t, scaled by total cash compensation to CFO period t; $COB\_COSTOCK_{i,t}$ is number of conditional stocks held by COB of firm i time t, scaled by number of common stocks held by COB at time t; $CEO\_COSTOCK_{i,t}$ is number of conditional stocks held by CEO of firm i time t, scaled by number of common stocks held by CEO at time t; $CFO\_COSTOCK_{i,t}$ is number of conditional stocks held by CFO of firm i time t, scaled by number of common stocks held by CFO at time t; $COB\_OPT_{i,t}$ is number of executive stock options held by COB of firm i time t, scaled by number of common stocks held by COB at time t; $CEO\_OPT_{i,t}$ is number of executive stock options held by CEO of firm i time t, scaled by number of common stocks held by CEO at time t; $CFO\_OPT_{i,t}$ is number of executive stock options held by CFO of firm i time t, scaled by number of common stocks held by CFO at time t; $BATH_{i,t}$ is changes in pre-impairment earnings of firm i from period t-1 to t, scaled by total assets at time t-1, when below the median of nonzero negative values of this variable; otherwise 0; $SMOOTH_{i,t}$ is changes in pre-impairment earnings of firm i from period t-1 to t, scaled by total assets at time t-1, when above the median of nonzero positive values of this variable; otherwise 0; $\Delta COB_{i,t}$ equals 1 if firm i changes COB in period t; otherwise 0; $\Delta CEO_{i,t}$ equals 1 if firm i changes CEO in period t; otherwise 0; $\Delta CFO_{i,t}$ equals 1 if firm i changes CFO in period t; otherwise 0; $DEBT_{i,t}$ is pre-impairment debt-to-equity ratio of firm i, period t; $lnSIZE\_MV_{i,t}$ is natural logarithm of equity-market value of firm i time t; $lnBOARD\_SIZE_{i,t}$ is natural logarithm of number of board members of firm i time t; $NONEXE_{i,t}$ is number of independent non-executive directors in firm i time t, scaled by total number of board members of firm i time t; $lnBOARD\_MEET_{i,t}$ is natural logarithm of number of board meetings of firm i time t; $COB\_STOCK_{i,t}$ is number of common stocks held by COB of firm i time t, scaled by total number of outstanding common stocks of firm i time t; $CEO\_STOCK_{i,t}$ is number of common stocks held by CEO of firm i time t, scaled by total number of outstanding common stocks of firm i time t; $CFO\_STOCK_{i,t}$ is number of common stocks held by CFO of firm i time t, scaled by total number of outstanding common stocks of firm i time t; $ACCEXP_{i,t}$ equals 1 if firm i time t has at least one audit-committee member being financial-accounting expert; otherwise 0; $lnAUDIT\_SIZE_{i,t}$ is natural logarithm of number of audit-committee members of firm i time t; $lnAUDIT\_MEET_{i,t}$ is natural logarithm of number of audit-committee meetings of firm i time t; $BLOCK\%_{i,t}$ is cumulative percentage of outstanding common stocks held by blockholders owning at least 5% of outstanding common stocks of firm i time t; $lnBLOCK\_NUM_{i,t}$ is natural logarithm of number of blockholders owning at least 5% of outstanding stocks of firm i time t; $CROSS_{i,t}$ equals 1 if firm i is cross-listed on the New York Stock Exchange or the NASDAQ Stock Exchange time t; otherwise 0. *indicates significant at 10% level (two-tailed), **indicates significant at 5 % level (two-tailed), *** indicates significant at 1% level (two-tailed). To investigate the effect of outliers, all the continuous variables are winsorised at 5^{th} and 95^{th} percentile.

Table B5 – Abnormal-impairment losses estimated on stock returns and book-to-market ratios – hypotheses 4a to 4al[44]

		Understated impairment losses					*Overstated impairment losses*			
		Earnings management		*Earnings management and corporate governance*			*Earnings management*		*Earnings management and corporate governance*	
Test variables	*Pred*	*Non-winsorised*	*Winsorised*	*Non-winsorised*	*Winsorised*	*Pred*	*Non-winsorised*	*Winsorised*	*Non-winsorised*	*Winsorised*
Intercept		-0.014***	-0.009***	-0.017***	-0.011***		-0.092	-0.017	-0.039	0.002
		(-4.31)	(-5.06)	(-3.67)	(-3.34)		(-1.16)	(-0.84)	(-0.39)	(0.41)
$COB\_BON_{i,t}$	-	0.003***	0.003**	0.002	0.001	-	0.057**	0.019*	0.065**	0.019
		(2.93)	(2.61)	(1.62)	(1.07)		(1.98)	(1.64)	(2.05)	(1.62)
$CEO\_BON_{i,t}$	-	$8.63*10^{-4}$	0.002*	$9.80*10^{-4}$	0.003**	-	0.006	0.021**	0.006	0.021**
		(1.39)	(1.67)	(1.47)	(2.04)		(1.45)	(2.09)	(1.11)	(2.07)
$CFO\_BON_{i,t}$	-	$5.04*10^{-4}$	-0.002	$2.26*10^{-4}$	-0.002	-	-0.089***	-0.040***	-0.090***	-0.040***
		(0.76)	(-1.17)	(0.33)	(-1.62)		(-3.09)	(-3.89)	(-3.45)	(-3.94)
$COB\_$	-	$-1.75*10^{-4}$	$-9.93*10^{-4}$	$-3.25*10^{-4}$	$-6.04*10^{-4}$	-	-0.018	-0.027	-0.013	-0.022
$COSTOCK_{i,t}$		(-1.49)	(-0.73)	(-1.31)	(-0.37)		(-0.96)	(-1.36)	(-0.60)	(-1.14)
$CEO\_$	-	$-3.24*10^{-7}$***	$5.01*10^{-6}$	$1.14*10^{-5}$	$1.65*10^{-6}$	-	$2.30*10^{-6}$	$3.15*10^{-4}$	$-5.95*10^{-5}$	$-3.69*10^{-5}$
$COSTOCK_{i,t}$		(-5.14)	(0.17)	(0.90)	(0.05)		(1.07)	(1.63)	(-0.14)	(-0.16)
$CFO\_$	-	$-4.83*10^{-7}$*	$-1.06*10^{-5}$	$-3.42*10^{-7}$	$-5.11*10^{-6}$	-	$-6.75*10^{-5}$*	$-6.57*10^{-5}$	$-9.91*10^{-5}$**	$-2.97*10^{-5}$
$COSTOCK_{i,t}$		(-1.73)	(-1.03)	(-1.08)	(-0.48)		(-1.88)	(-0.67)	(-2.29)	(-0.30)
$COB\_OPTION_{i,t}$	-	$1.60*10^{-4}$**	$7.57*10^{-4}$	$2.23*10^{-4}$*	0.001*	-	-0.018	0.001	-0.029	0.002
		(2.15)	(1.43)	(1.91)	(1.73)		(-1.23)	(0.18)	(-1.43)	(0.26)
$CEO\_OPTION_{i,t}$	-	$1.09*10^{-5}$***	$9.64*10^{-6}$	$1.18*10^{-5}$	$-3.35*10^{-6}$	-	$4.64*10^{-5}$	$-9.50*10^{-5}$	$-8.00*10^{-5}$	$-2.88*10^{-4}$
		(2.94)	(0.40)	(0.97)	(-0.14)		(1.21)	(-0.55)	(-0.62)	(-1.53)
$CFO\_OPTION_{i,t}$	-	2.68**10^{-6}*	$2.07*10^{-5}$**	$2.72*10^{-6}$*	$2.61*10^{-5}$***	-	1.08**10^{-4}***	$1.42*10^{-4}$**	$1.31*10^{-4}$***	$1.53*10^{-4}$**
		(1.73)	(2.37)	(1.72)	(2.90)		(5.15)	(2.03)	(3.87)	(2.01)

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[44] No test results are provided for hypotheses 4g and 4h.

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		Understated impairment losses					**Overstated impairment losses**			
		Earnings management		*Earnings management and corporate governance*			*Earnings management*		*Earnings management and corporate governance*	
Test variables	*Pred*	*Non-winsorised*	*Winsorised*	*Non-winsorised*	*Winsorised*	*Pred*	*Non-winsorised*	*Winsorised*	*Non-winsorised*	*Winsorised*
$BATH_{i,t}$	-	0.007***	0.006	0.007**	0.005	-	0.044	-0.010	0.091*	0.018
		(2.63)	(1.32)	(2.44)	(1.13)		(0.98)	(-0.35)	(1.67)	(0.60)
$SMOOTH_{i,t}$	+	$9.59*10^{-4}$***	$7.43*10^{-4}$***	$8.25*10^{-4}$***	$5.51*10^{-4}$**	+	0.001	$1.55*10^{-4}$	0.002	$-7.02*10^{-5}$
		(3.54)	(3.84)	(2.88)	(2.56)		(0.19)	(0.09)	(0.29)	(-0.04)
$\Delta COB_{i,t}$	+	$-5.55*10^{-4}$	$3.94*10^{-5}$	$-8.54*10^{-4}$	$-1.35*10^{-4}$	+	-0.002	$-2.84*10^{-4}$	-0.013	-0.002
		(-0.69)	(0.14)	(-1.02)	(-0.47)		(-0.29)	(-0.12)	(-1.43)	(-0.91)
$\Delta CEO_{i,t}$	+	$7.51*10^{-4}$	$4.36*10^{-4}$	0.001*	$5.42*10^{-4}$	+	0.017**	0.005**	0.016**	0.004**
		(1.58)	(1.30)	(1.92)	(1.49)		(2.35)	(2.48)	(2.29)	(2.13)
$\Delta CFO_{i,t}$	+	$1.62*10^{-4}$	$-2.11*10^{-4}$	$-3.32*10^{-4}$	$-2.45*10^{-4}$	+	-0.005	-0.003	-0.010	-0.004
		(0.04)	(-0.75)	(-0.07)	(-0.77)		(-0.59)	(-1.19)	(-1.04)	(-1.54)
$DEBT_{i,t}$	-	$-1.20*10^{-5}$	$1.77*10^{-4}$***	$-1.41*10^{-5}$*	$1.62*10^{-4}$***	-	$-8.28*10^{-5}$	$3.96*10^{-4}$	$-1.22*10^{-4}$	$3.23*10^{-4}$
		(-1.55)	(4.81)	(-1.97)	(4.07)		(-0.93)	(1.12)	(-1.62)	(1.01)
$lnSIZE\_MV_{i,t}$	+	$4.84*10^{-4}$***	$2.58*10^{-4}$***	$9.86*10^{-4}$***	$4.63*10^{-4}$***	+	0.003	$1.19*10^{-4}$	-0.004	-0.002
		(3.26)	(2.95)	(2.68)	(2.85)		(0.66)	(0.12)	(-0.94)	(-1.33)
$lnBOARD\_SIZE_{i,t}$	+			-0.003*	-0.001	-			0.009	0.003
				(-1.92)	(-1.56)				(0.47)	(0.53)
$NONEXE_{i,t}$	+			-0.003	$1.60*10^{-5}$	-			0.029	0.010
				(-1.03)	(0.01)				(0.96)	(1.08)
$lnBOARD\_MEET_{i,t}$	+			$6.56*10^{-4}$	$5.54*10^{-4}$	-			0.012	0.003
				(1.27)	(1.16)				(1.10)	(0.71)
$COB\_STOCK_{i,t}$	+			0.008*	0.014*	-			0.105**	0.066
				(1.92)	(1.96)				(2.16)	(1.38)
$CEO\_STOCK_{i,t}$	+			-0.002***	-0.002	-			-0.147**	-0.129**
				(-4.65)	(-0.46)				(-2.42)	(-2.33)
$CFO\_STOCK_{i,t}$	+			0.019	0.137	-			-4.401***	-1.475
				(0.76)	(1.17)				(-2.83)	(-1.54)
$ACCEXP_{i,t}$	+			$-3.93*10^{-5}$	$9.08*10^{-5}$	-			0.008	0.002
				(-0.10)	(0.30)				(0.90)	(1.04)
$lnAUDIT\_SIZE_{i,t}$	+			$-4.45*10^{-4}$	-0.001*	-			-0.013	-0.009*
				(-0.57)	(-1.94)				(-0.80)	(-1.70)
$lnAUDIT\_MEET_{i,t}$	+			$7.55*10^{-5}$	$4.45*10^{-4}$	-			0.029**	0.008**
				(0.12)	(0.95)				(2.16)	(2.09)

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	Understated impairment losses					Overstated impairment losses				
		Earnings management		Earnings management and corporate governance			Earnings management		Earnings management and corporate governance	
Test variables	Pred	Non-winsorised	Winsorised	Non-winsorised	Winsorised	Pred	Non-winsorised	Winsorised	Non-winsorised	Winsorised
$BLOCK\%_{i,t}$	+			$1.40*10^{-5}$ (0.81)	$5.62*10^{-6}$ (0.46)	-			$1.93*10^{-4}$ (0.81)	$4.70*10^{-5}$ (0.57)
$lnBLOCK\_NUM_{i,t}$	+			$-5.61*10^{-4}$ (-1.14)	$-3.45*10^{-4}$ (-1.02)	-			0.003 (0.43)	$7.63*10^{-4}$ (0.31)
$CROSS_{i,t}$	+			$7.64*10^{-5}$ (0.11)	$2.50*10^{-4}$ (0.54)	-			0.027* (1.65)	0.008** (2.05)
N		899	899	806	806		889	889	797	797
Log-likelihood		2876.457	236.190	2546.962	210.105		-17.790	101.819	4.917	114.387
Wald Chi2-test		25.72***	6.25***	4.65***	3.72***		3.75**	2.89***	2.16***	2.75***
Pseudo R^2		-0.012	-0.013	-0.019	-0.017		0.639	-0.310	1.114	-0.511
Max VIF		1.91	4.15	2.65	4.22		1.91	4.15	2.65	4.22
Mean VIF		1.18	1.67	1.49	1.69		1.18	1.67	1.49	1.69

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Understated impairment losses (AB_IMP_NEG) equal negative abnormal impairment losses equals negative differences between reported impairment losses period *t* scaled by total assets at time t-1 and estimated normal (expected) impairment losses of firm i period t. If the estimated normal (expected) impairment losses are negative, they are censored at zero. Overstated impairment losses (AB_IMP_POS) equal positive differences between reported impairment losses period *t* scaled by total assets at time t-1 and estimated normal (expected) impairment losses of firm i period t. If the estimated normal (expected) impairment losses are negative, they are censored at zero. Normal (expected) impairment losses are fitted values from regressions of reported impairment losses on stock returns (RET) and book-to-market ratios (BM).

$COB\_BON_{i,t}$ is cash-bonus payment to COB of firm i period t, scaled by total cash compensation to COB period t; $CEO\_BON_{i,t}$ is cash-bonus payment to CEO of firm i period t, scaled by total cash compensation to CEO period t; $CFO\_BON_{i,t}$ is cash-bonus payment to CFO of firm i period t, scaled by total cash compensation to CFO period t; $COB\_COSTOCK_{i,t}$ is number of conditional stocks held by COB of firm i time t, scaled by number of common stocks held by COB at time t; $CEO\_COSTOCK_{i,t}$ is number of conditional stocks held by CEO of firm i time t, scaled by number of common stocks held by CEO at time t; $CFO\_COSTOCK_{i,t}$ is number of conditional stocks held by CFO of firm i time t, scaled by number of common stocks held by CFO at time t; $COB\_OPT_{i,t}$ is number of executive stock options held by COB of firm i time t, scaled by number of common stocks held by COB at time t; $CEO\_OPT_{i,t}$ is number of executive stock options held by CEO of firm i time t, scaled by number of common stocks held by CEO at time t; $CFO\_OPT_{i,t}$ is number of executive stock options held by CFO of firm i time t, scaled by number of common stocks held by CFO at time t; $BATH_{i,t}$ is changes in pre-impairment earnings of firm i from period t-1 to t, scaled by total assets at time t-1, when below the median of nonzero negative values of this variable; otherwise 0; $SMOOTH_{i,t}$ is changes in pre-impairment earnings of firm i from period t-1 to t, scaled by total assets at time t-1, when above the median of nonzero positive values of this variable; otherwise 0; $\Delta COB_{i,t}$ equals 1 if firm i changes COB in period t; otherwise 0; $\Delta CEO_{i,t}$ equals 1 if firm i changes CEO in period t; otherwise 0; $\Delta CFO_{i,t}$ equals 1 if firm i changes CFO in period t; otherwise 0; $DEBT_{i,t}$ is pre-impairment debt-to-equity ratio of firm i, period t; $lnSIZE\_MV_{i,t}$ is natural logarithm of equity-market value of firm i time t; $lnBOARD\_SIZE_{i,t}$ is natural logarithm of number of board members of firm i time t; $NONEXE_{i,t}$ is number of independent non-executive directors in firm i time t, scaled by total number of board members of firm i time t; $lnBOARD\_MEET_{i,t}$ is natural logarithm of number of board meetings of firm i time t; $COB\_STOCK_{i,t}$ is number of common stocks held by COB of firm i time t, scaled by total number of outstanding common stocks of firm i time t; $CEO\_STOCK_{i,t}$ is number of common stocks held by CEO of firm i time t, scaled by total number of outstanding common stocks of firm i time t; $CFO\_STOCK_{i,t}$ is number of common stocks held by CFO of firm i time t, scaled by total number of outstanding common stocks of firm i time t; $ACCEXP_{i,t}$ equals 1 if firm i time t has at least one audit-committee member being financial-accounting expert; otherwise 0; $lnAUDIT\_SIZE_{i,t}$ is natural logarithm of number of audit-committee members of firm i time t; $lnAUDIT\_MEET_{i,t}$ is natural logarithm of number of audit-committee meetings of firm i time t; $BLOCK\%_{i,t}$ is cumulative percentage of outstanding common stocks held by blockholders owning at least 5% of outstanding common stocks of firm i time t; $lnBLOCK\_NUM_{i,t}$ is natural logarithm of number of blockholders owning at least 5% of outstanding stocks of firm i time t; $CROSS_{i,t}$ equals 1 if firm i is cross-listed on the New York Stock Exchange or the NASDAQ Stock Exchange time t; otherwise 0. *indicates significant at 10% level (two-tailed), **indicates significant at 5 % level (two-tailed), *** indicates significant at 1% level (two-tailed). To investigate the effect of outliers, all the continuous variables are winsorised at 5^{th} and 95^{th} percentile.

Table B6 – Abnormal-impairment losses estimated on firm-level economic variables – hypotheses 4a to 4al[45]

		Understated impairment losses					***Overstated impairment losses***			
		Earnings management		*Earnings management and corporate governance*			*Earnings management*		*Earnings management and corporate governance*	
Test variables	*Pred*	*Non-winsorised*	*Winsorised*	*Non-winsorised*	*Winsorised*	*Pred*	*Non-winsorised*	*Winsorised*	*Non-winsorised*	*Winsorised*
Intercept		-0.015***	-0.010***	-0.018***	-0.012***		-0.109	-0.023	-0.052	$5.62*10^{-4}$
		(-4.27)	(-5.01)	(-3.78)	(-3.59)		(-1.39)	(-1.17)	(-0.56)	(0.02)
$COB\_BON_{i,t}$	-	0.003***	0.003***	0.003*	0.002	-	0.064**	0.021*	0.077**	0.021*
		(3.12)	(2.64)	(1.92)	(1.34)		(2.23)	(1.73)	(2.37)	(1.72)
$CEO\_BON_{i,t}$	-	$8.80*10^{-4}$	0.002**	$9.31*10^{-4}$	0.003**	-	0.005	0.018*	0.005	0.018*
		(1.34)	(1.97)	(1.40)	(2.22)		(1.30)	(1.88)	(0.98)	(1.94)
$CFO\_BON_{i,t}$	-	$3.03*10^{-4}$	-0.002	$-1.70*10^{-5}$	-0.003**	-	-0.086***	-0.036***	-0.087***	-0.036***
		(0.46)	(-1.61)	(-0.03)	(-2.05)		(-3.00)	(-3.55)	(-3.39)	(-3.71)
$COB\_COSTOCK_{i,t}$	-	$-1.97*10^{-4}$	$-8.93*10^{-4}$	$-3.40*10^{-4}$	$-6.10*10^{-4}$	-	-0.048	-0.031	-0.050	-0.028
		(-1.60)	(-0.64)	(-1.31)	(-0.37)		(-1.62)	(-1.45)	(-1.56)	(-1.30)
$CEO\_COSTOCK_{i,t}$	-	$-3.50*10^{-7}$***	$7.29*10^{-4}$	$7.49*10^{-7}$	$-5.80*10^{-6}$	-	$1.55*10^{-6}$	$2.00*10^{-4}$	$-3.38*10^{-4}$	$-1.56*10^{-4}$
		(-5.43)	(0.25)	(0.60)	(-0.17)		(0.75)	(1.02)	(-0.62)	(-0.65)
$CFO\_COSTOCK_{i,t}$	-	$-5.76*10^{-7}$**	$-1.28*10^{-5}$	$-4.08*10^{-7}$	$-6.01*10^{-6}$	-	$-7.92*10^{-5}$**	$-6.15*10^{-5}$	$-1.24*10^{-4}$***	$-3.60*10^{-4}$
		(-2.01)	(-1.19)	(-1.34)	(-0.56)		(-2.36)	(-0.63)	(-2.89)	(-0.37)
$COB\_OPTION_{i,t}$	-	$1.84*10^{-4}$**	$6.86*10^{-4}$	$2.53*10^{-4}$**	0.001	-	-0.027*	$5.44*10^{-6}$	-0.041**	$4.04*10^{-4}$
		(2.38)	(1.25)	(2.11)	(1.57)		(-1.66)	(0.00)	(-1.97)	(0.05)
$CEO\_OPTION_{i,t}$	-	$1.04*10^{-5}$***	$5.77*10^{-6}$	$1.28*10^{-4}$	$-2.59*10^{-6}$	-	$2.99*10^{-5}$	$-1.20*10^{-4}$	$-3.54*10^{-5}$	$-2.97*10^{-4}$
		(2.88)	(0.24)	(1.05)	(-0.11)		(0.95)	(-0.67)	(-0.24)	(-1.56)
$CFO\_OPTION_{i,t}$	-	$2.47*10^{-6}$	$1.95*10^{-5}$**	$2.51*10^{-6}$	$2.52*10^{-5}$***	-	$1.15*10^{-4}$***	$1.50*10^{-4}$**	$1.49*10^{-4}$***	$1.59*10^{-4}$**
		(1.54)	(2.17)	(1.49)	(2.70)		(6.56)	(2.12)	(4.89)	(2.13)

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[45] No test results are provided for hypotheses 4g and 4h.

Table continuesfrom previous page.

		Understated impairment losses					**Overstated impairment losses**			
		Earnings management		*Earnings management and corporate governance*			*Earnings management*		*Earnings management and corporate governance*	
Test variables	*Pred*	*Non-winsorised*	*Winsorised*	*Non-winsorised*	*Winsorised*	*Pred*	*Non-winsorised*	*Winsorised*	*Non-winsorised*	*Winsorised*
$BATH_{i,t}$	-	0.005*	0.002	0.004	0.001	-	0.026	-0.017	0.055	0.005
		(1.67)	(0.47)	(1.39)	(0.27)		(0.62)	(-0.59)	(1.21)	(0.16)
$SMOOTH_{i,t}$	+	0.001***	8.78*10^{-4}***	0.001***	7.06*10^{-4}***	+	9.54*10^{-4}	-1.59*10^{-4}	0.002	-4.69*10^{-4}
		(3.65)	(4.11)	(3.03)	(2.96)		(0.15)	(-0.09)	(0.27)	(-0.28)
$\Delta COB_{i,t}$	+	-7.72*10^{-4}	-1.32*10^{-4}	-0.001	-3.22*10^{-4}	+	-0.005	-0.001	-0.015*	-0.003
		(-0.93)	(-0.45)	(-1.26)	(-1.10)		(-0.54)	(-0.50)	(-1.66)	(-1.32)
$\Delta CEO_{i,t}$	+	6.31*10^{-4}	3.47*10^{-4}	9.18*10^{-4}*	4.63*10^{-4}	+	0.016**	0.005*10^{-4}**	0.014*	0.004*
		(1.33)	(1.02)	(1.76)	(1.26)		(2.19)	(2.33)	(1.93)	(1.93)
$\Delta CFO_{i,t}$	+	8.09*10^{-5}	-1.30**10^{-4}	7.71*10^{-5}	-1.33*10^{-4}	+	-0.006	-0.003	-0.009	-0.003
		(0.19)	(-0.44)	(0.16)	(-0.39)		(-0.62)	(-1.17)	(-0.92)	(-1.39)
$DEBT_{i,t}$	-	-1.12*10^{-5}	1.64*10^{-4}***	-1.38*10^{-5}*	1.51*10^{-4}***	-	-6.59*10^{-7}	3.52*10^{-4}	-3.47*10^{-5}	2.91*10^{-4}
		(-1.40)	(4.43)	(-1.91)	(3.74)		(-0.01)	(1.01)	(-0.31)	(0.93)
$lnSIZE\_MV_{i,t}$	+	5.06*10^{-4}***	2.71*10^{-4}***	0.001***	5.32*10^{-4}***	+	0.003	4.37*10^{-4}	-0.002	-0.001
		(3.27)	(3.03)	(2.81)	(3.29)		(0.90)	(0.46)	(-0.48)	(-0.89)
$lnBOARD\_SIZE_{i,t}$	+			-0.003**	-0.001*	-			8.20*10^{-4}	9.62*10^{-4}
				(-1.97)	(-1.66)				(0.04)	(0.18)
$NONEXE_{i,t}$	+			-0.003	-3.50*10^{-4}	-			0.033	0.011
				(-1.22)	(-0.27)				(1.11)	(1.24)
$lnBOARD\_MEET_{i,t}$	+			7.53*10^{-4}	6.68*10^{-4}	-			0.009	0.002
				(1.34)	(1.30)				(0.82)	(0.45)
$COB\_STOCK_{i,t}$	+			0.007*	0.011	-			0.103**	0.062
				(1.77)	(1.59)				(2.05)	(1.32)
$CEO\_STOCK_{i,t}$	+			-0.002***	-0.001	-			-0.177***	-0.127**
				(-5.29)	(-0.33)				(-3.01)	(-2.40)
$CFO\_STOCK_{i,t}$	+			0.022	0.164	-			-5.095***	-1.601
				(0.92)	(1.27)				(-2.78)	(-1.61)
$ACCEXP_{i,t}$	+			1.07*10^{-4}	2.10*10^{-4}	-			0.005	0.002
				(0.27)	(0.68)				(0.55)	(0.79)
$lnAUDIT\_SIZE_{i,t}$	+			-3.84*10^{-4}	-0.001*	-			-0.013	-0.009*
				(-0.47)	(-1.92)				(-0.77)	(-1.71)
$lnAUDIT\_MEET_{i,t}$	+			-1.39*10^{-4}	2.93*10^{-4}	-			0.028**	0.008**
				(-0.20)	(0.60)				(2.04)	(2.06)

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	Understated impairment losses					Overstated impairment losses				
		Earnings management		*Earnings management and corporate governance*			*Earnings management*		*Earnings management and corporate governance*	
Test variables	*Pred*	*Non-winsorised*	*Winsorised*	*Non-winsorised*	*Winsorised*	*Pred*	*Non-winsorised*	*Winsorised*	*Non-winsorised*	*Winsorised*
$BLOCK\%_{i,t}$	+			$1.08*10^{-5}$ (0.62)	$2.88*10^{-6}$ (0.23)	-			$1.37*10^{-4}$ (0.57)	$4.28*10^{-5}$ (0.53)
$lnBLOCK\_NUM_{i,t}$	+			$-4.03*10^{-4}$ (-0.81)	$-2.10*10^{-4}$ (-0.59)	-			0.002 (0.31)	$-6.75*10^{-7}$ (-0.00)
$CROSS_{i,t}$	+			$2.82*10^{-4}$ (0.40)	$4.04*10^{-4}$ (0.84)	-			0.022 (1.40)	0.007* (1.84)
N		899	899	806	806		869	869	779	779
Log-likelihood		2772.430	3104.714	2453.533	2757.123		-17.790	102.863	8.344	118.112
Wald Chi2-test		18.45***	5.42***	4.31***	3.13***		4.79**	2.68***	2.42***	2.64***
Pseudo R^2		-0.012	-0.012	-0.019	-0.016		0.676	-0.284	1.207	-0.467
Max VIF		1.91	4.15	2.65	4.22		1.91	4.15	2.65	4.22
Mean VIF		1.18	1.67	1.49	1.69		1.18	1.67	1.49	1.69

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Understated impairment losses (AB_IMP_NEG*)* equal negative abnormal impairment losses equals negative differences between reported impairment losses period *t* scaled by total assets at time t-1 and estimated normal (expected) impairment losses of firm i period t. If the estimated normal (expected) impairment losses are negative, they are censored at zero. Overstated impairment losses (AB_IMP_POS) equal positive differences between reported impairment losses period *t* scaled by total assets at time t-1 and estimated normal (expected) impairment losses of firm i period t. If the estimated normal (expected) impairment losses are negative, they are censored at zero. Normal (expected) impairment losses are fitted values from regressions of reported impairment losses on firm-level economic variables (RET, ΔSALES%, ΔROA, ΔOCF, BM).

COB_BON$_{i,t}$ is cash-bonus payment to COB of firm i period t, scaled by total cash compensation to COB period t; CEO_BON$_{i,t}$ is cash-bonus payment to CEO of firm i period t, scaled by total cash compensation to CEO period t; CFO_BON$_{i,t}$ is cash-bonus payment to CFO of firm i period t, scaled by total cash compensation to CFO period t; COB_COSTOCK$_{i,t}$ is number of conditional stocks held by COB of firm i time t, scaled by number of common stocks held by COB at time t; CEO_COSTOCK$_{i,t}$ is number of conditional stocks held by CEO of firm i time t, scaled by number of common stocks held by CEO at time t; CFO_COSTOCK$_{i,t}$ is number of conditional stocks held by CFO of firm i time t, scaled by number of common stocks held by CFO at time t; COB_OPT$_{i,t}$ is number of executive stock options held by COB of firm i time t, scaled by number of common stocks held by COB at time t; CEO_OPT$_{i,t}$ is number of executive stock options held by CEO of firm i time t, scaled by number of common stocks held by CEO at time t; CFO_OPT$_{i,t}$ is number of executive stock options held by CFO of firm i time t, scaled by number of common stocks held by CFO at time t; BATH$_{i,t}$ is changes in pre-impairment earnings of firm i from period t-1 to t, scaled by total assets at time t-1, when below the median of nonzero negative values of this variable; otherwise 0; SMOOTH$_{i,t}$ is changes in pre-impairment earnings of firm i from period t-1 to t, scaled by total assets at time t-1, when above the median of nonzero positive values of this variable; otherwise 0; ΔCOB$_{i,t}$ equals 1 if firm i changes COB in period t; otherwise 0; ΔCEO$_{i,t}$ equals 1 if firm i changes CEO in period t; otherwise 0; ΔCFO$_{i,t}$ equals 1 if firm i changes CFO in period t; otherwise 0; DEBT$_{i,t}$ is pre-impairment debt-to-equity ratio of firm i, period t; lnSIZE_MV$_{i,t}$ is natural logarithm of equity-market value of firm i time t; lnBOARD_SIZE$_{i,t}$ is natural logarithm of number of board members of firm i time t; NONEXE$_{i,t}$ is number of independent non-executive directors in firm i time t, scaled by total number of board members of firm i time t; lnBOARD_MEET$_{i,t}$ is natural logarithm of number of board meetings of firm i time t; COB_STOCK$_{i,t}$ is number of common stocks held by COB of firm i time t, scaled by total number of outstanding common stocks of firm i time t; CEO_STOCK$_{i,t}$ is number of common stocks held by CEO of firm i time t, scaled by total number of outstanding common stocks of firm i time t; CFO_STOCK$_{i,t}$ is number of common stocks held by CFO of firm i time t, scaled by total number of outstanding common stocks of firm i time t; ACCEXP$_{i,t}$ equals 1 if firm i time t has at least one audit-committee member being financial-accounting expert; otherwise 0; lnAUDIT_SIZE$_{i,t}$ is natural logarithm of number of audit-committee members of firm i time t; lnAUDIT_MEET$_{i,t}$ is natural logarithm of number of audit-committee meetings of firm i time t; BLOCK%$_{i,t}$ is cumulative percentage of outstanding common stocks held by blockholders owning at least 5% of outstanding common stocks of firm i time t; lnBLOCK_NUM$_{i,t}$ is natural logarithm of number of blockholders owning at least 5% of outstanding stocks of firm i time t; CROSS$_{i,t}$ equals 1 if firm i is cross-listed on the New York Stock Exchange or the NASDAQ Stock Exchange time t; otherwise 0. *indicates significant at 10% level (two-tailed), **indicates significant at 5 % level (two-tailed), *** indicates significant at 1% level (two-tailed). To investigate the effect of outliers, all the continuous variables are winsorised at 5th and 95th percentile.

Table B7 – Changes in cash-bonus payments – hypotheses 4a to 4al[46]

		Understated impairment losses					Overstated impairment losses			
		Earnings management		*Earnings management and corporate governance*			*Earnings management*		*Earnings management and corporate governance*	
Test variables	*Pred*	*Non-winsorised*	*Winsorised*	*Non-winsorised*	*Winsorised*	*Pred*	*Non-winsorised*	*Winsorised*	*Non-winsorised*	*Winsorised*
Intercept		0.004	0.003**	0.010**	0.005***		-0.018**	-0.008*	0.006	0.002
		(1.21)	(2.37)	(2.35)	(2.78)		(-1.98)	(-1.95)	(0.36)	(0.30)
$\Delta COB\_BON_{i,t,t-1}$	-	$-239*10^{-4}$	$7.86*10^{-4}$	-0.002*	-0.003	-	0.001	0.002	0.004	0.003
		(-0.60)	(0.79)	(-1.79)	(-1.31)		(1.42)	(0.37)	(1.14)	(0.52)
$\Delta CEO\_BON_{i,t,t-1}$	-	$-6.89*10^{-6}$	$2.12*10^{-4}$	$-1.29*10^{-5}$	$4.37*10^{-5}$	-	$2.20*10^{-4}$	$4.58*10^{-4}$	$-6.38*10^{-4}$	0.001
		(-0.09)	(0.24)	(-0.16)	(0.12)		(1.40)	(0.47)	(-0.86)	(1.14)
$\Delta CFO\_BON_{i,t,t-1}$	-	-0.001**	$-8.37*10^{-4}$	-0.002**	$-8.29*10^{-4}$**	-	-0.004	-0.003***	-0.008***	-0.004***
		(-2.40)	(-0.93)	(-2.50)	(-2.24)		(-1.62)	(-2.68)	(-3.02)	(-3.72)
$COB\_COSTOCK_{i,t}$	-	$1.89*10^{-4}$	$6.73*10^{-4}$	$3.04*10^{-4}$	$7.60*10^{-4}$	-	-0.003	-0.002	$-9.01*10^{-4}$	0.001
		(0.87)	(0.46)	(1.23)	(0.54)		(-1.38)	(-0.38)	(-0.41)	(0.29)
$CEO\_COSTOCK_{i,t}$	-	$6.90*10^{-5}$*	$4.61*10^{-5}$**	$4.63*10^{-5}$	$1.16*10^{-5}$	-	$-7.45*10^{-8}$	$3.25*10^{-5}$	$-2.62*10^{-6}$	$-6.48*10^{-6}$
		(1.90)	(2.05)	(1.37)	(0.55)		(-0.18)	(0.64)	(-0.04)	(-0.11)
$CFO\_COSTOCK_{i,t}$	-	$5.00*10^{-7}$	$-8.08*10^{-6}$	$7.17*10^{-7}$	$3.45*10^{-6}$	-	$-4.69*10^{5}$	$-4.46*10^{-5}$*	$-5.64*10^{-5}$	$-3.70*10^{-5}$
		(1.36)	(-1.05)	(1.04)	(0.40)		(-1.28)	(-1.96)	(-1.61)	(-1.50)
$COB\_OPTION_{i,t}$	-	$-1.20*10^{-4}$*	$-3.48*10^{-6}$	$-1.82*10^{-4}$**	$-8.66*10^{-5}$	-	$-8.21*10^{-4}$	$-1.92*10^{-4}$	-0.001	-0.002
		(-1.66)	(-0.01)	(-1.98)	(-0.18)		(-1.03)	(-0.11)	(-1.07)	(-1.07)
$CEO\_OPTION_{i,t}$	-	$-2.31*10^{-5}$***	$-2.06*10^{-5}$	$-2.47*10^{-5}$***	$-6.73*10^{-7}$	-	$8.70*10^{-61}$	$-4.25*10^{-5}$	$-2.75*10^{-5}$	$-1.05*10^{-4}$**
		(-2.86)	(-1.38)	(-2.77)	(-0.04)		(1.24)	(-0.98)	(-1.41)	(-2.19)
$CFO\_OPTION_{i,t}$	-	$7.80*10^{-7}$	$3.76*10^{-6}$	$-1.77*10^{-8}$	$-8.54*10^{-6}$	-	$1.10*10^{-5**}$	$3.36*10^{-5}$*	$1.43*10^{-5}$***	$4.78*10^{-5}$**
		(0.78)	(0.69)	(-0.02)	(-1.50)		(2.40)	(1.73)	(2.66)	(2.44)

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[46] No test results are provided for hypotheses 4g and 4h.

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		Understated impairment losses					**Overstated impairment losses**			
		Earnings management		*Earnings management and corporate governance*			*Earnings management*		*Earnings management and corporate governance*	
Test variables	*Pred*	*Non-winsorised*	*Winsorised*	*Non-winsorised*	*Winsorised*	*Pred*	*Non-winsorised*	*Winsorised*	*Non-winsorised*	*Winsorised*
$BATH_{i,t}$	-	0.004	0.002	0.003	$1.17*10^{-4}$	-	-0.018*	-0.017***	-0.011	-0.010*
		(1.13)	(0.71)	(0.97)	(0.04)		(-1.69)	(-2.88)	(-1.21)	(-1.78)
$SMOOTH_{i,t}$	+	-0.001**	$-4.02*10^{-4}$***	$-9.18*10^{-4}$*	$-2.05*10^{-4}$	+	-0.001	$-1.11*10^{-4}$	$-9.66*10^{-4}$	$-3.39*10^{-4}$
		(-2.33)	(-2.72)	(-1.86)	(-1.28)		(-0.97)	(-0.27)	(-0.80)	(-0.84)
$\Delta COB_{i,t}$	+	$-7.73*10^{-4}$	$-2.08*10^{-4}$	$-7.43*10^{-4}$	$-2.17*10^{-4}$	+	-0.001	$-2.45*10^{-4}$	-0.003*	$-5.63*10^{-4}$
		(-1.42)	(-1.11)	(-1.28)	(-1.15)		(-0.63)	(-0.47)	(-1.67)	(-1.02)
$\Delta CEO_{i,t}$	+	$3.79*10^{-4}$	$5.78*10^{-5}$	$5.22*10^{-4}$	$2.20*10^{-5}$	+	0.003	0.001**	0.002*	0.001**
		(0.69)	(0.30)	(0.78)	(0.10)		(1.74)	(2.02)	(1.65)	(2.20)
$\Delta CFO_{i,t}$	+	$-3.32*10^{-4}$	$-9.56*10^{-6}$	$-5.83*10^{-4}$	$-1.98*10^{-4}$	+	$-4.24*10^{-4}$	$-4.73*10^{-4}$	-0.002	$-7.43*10^{-4}$
		(-0.57)	(-0.05)	(-0.96)	(-0.93)		(-0.23)	(-0.83)	(-1.33)	(-1.23)
$DEBT_{i,t}$	-	$-7.37*10^{-6}$	$1.77*10^{-5}$	$9.56*10^{-7}$	$5.49*10^{-5}$	-	$3.60*10^{-5}$	$1.14*10^{-4}$	$3.45*10^{-5}$	$1.27*10^{-4}$*
		(-0.86)	(0.52)	(0.15)	(1.57)		(1.49)	(1.52)	(0.89)	(1.67)
$lnSIZE\_MV_{i,t}$	+	$-3.31*10^{-5}$	$-2.82*10^{-5}$	$-2.59*10^{-4}$	$-1.40*10^{-4}$*	+	$1.16*10^{-4}$	$2.11*10^{-4}$	-0.002**	$-5.78*10^{-4}$**
		(-0.24)	(-0.43)	(-1.16)	(-1.64)		(0.18)	(1.12)	(-2.16)	(-2.20)
$lnBOARD\_SIZE_{i,t}$	+			$4.20*10^{-4}$	$1.56*10^{-4}$	-			0.010*	0.003**
				(0.38)	(0.38)				(1.90)	(2.49)
$NONEXE_{i,t}$	+			$6.22*10^{-4}$	$2.62*10^{-4}$	-			0.017**	0.004*
				(0.30)	(0.34)				(2.03)	(1.67)
$lnBOARD\_MEET_{i,t}$	+			$1.21*10^{-4}$	$-6.55*10^{-5}$	-			0.002	-0.002*
				(0.18)	(-0.16)				(0.81)	(-1.83)
$COB\_STOCK_{i,t}$	+			-0.002	-0.002	-			0.019*	0.013
				(-0.86)	(-0.46)				(1.85)	(1.23)
$CEO\_STOCK_{i,t}$	+			$-7.24*10^{-4}$	-0.003	-			-0.022	-0.014
				(-0.34)	(-1.32)				(-1.59)	(-1.31)
$CFO\_STOCK_{i,t}$	+			-0.015	-0.069	-			-0.244	-0.257
				(-0.65)	(-1.04)				(-1.39)	(-1.00)
$ACCEXP_{i,t}$	+			$5.08*10^{-4}$	$1.10*10^{-4}$	-			0.001	$1.25*10^{-4}$
				(0.99)	(0.59)				(0.87)	(0.24)
$lnAUDIT\_SIZE_{i,t}$	+			$-4.14*10^{-4}$	$-5.73*10^{-5}$	-			-0.003	$4.22*10^{-4}$
				(-0.39)	(-0.21)				(-1.00)	(0.46)
$lnAUDIT\_MEET_{i,t}$	+			-0.001	$-4.90*10^{-4}$*	-			0.003	0.001
				(-1.52)	(-1.75)				(1.16)	(1.30)

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		Understated impairment losses					**Overstated impairment losses**			
		Earnings management		*Earnings management and corporate governance*			*Earnings management*		*Earnings management and corporate governance*	
Test variables	*Pred*	*Non-winsorised*	*Winsorised*	*Non-winsorised*	*Winsorised*	*Pred*	*Non-winsorised*	*Winsorised*	*Non-winsorised*	*Winsorised*
$BLOCK\%_{i,t}$	+			$2.52*10^{-5}*$ (1.66)	$1.00*10^{-5}*$ (1.68)	-			$2.80*10^{-5}$ (0.64)	$1.38*10^{-5}$ (0.83)
$lnBLOCK\_NUM_{i,t}$	+			$-4.76*10^{-4}$ (-0.91)	$-1.12*10^{-4}$ (-0.58)	-			-0.005*** (-2.77)	-0.001*** (-2.77)
$CROSS_{i,t}$	+			0.003*** (2.61)	$7.79*10^{-4}**$ (2.14)	-			0.003 (1.11)	0.001 (1.48)
N		886	886	795	795		868	868	778	778
Log-likelihood		171.835	239.286	152.471	213.258		320.875	516.199	322.611	492.242
Wald Chi2-test		3.15***	1.63*	1.77***	2.07***		1.19	2.55***	1.14	2.92***
Pseudo R^2		-0.093	-0.051	-0.130	-0.079		-0.079	-0.039	-0.217	-0.093
Max VIF		1.84	2.14	5.85	2.22		1.84	2.14	5.85	2.22
Mean VIF		1.16	1.41	1.80	1.51		1.16	1.41	1.80	1.51

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Understated impairment losses (AB_IMP_NEG) equal negative abnormal impairment losses equals negative differences between reported impairment losses period *t* scaled by total assets at time t-1 and estimated normal (expected) impairment losses of firm i period t. If the estimated normal (expected) impairment losses are negative, they are censored at zero. Overstated impairment losses (AB_IMP_POS) equal positive differences between reported impairment losses period *t* scaled by total assets at time t-1 and estimated normal (expected) impairment losses of firm i period t. If the estimated normal (expected) impairment losses are negative, they are censored at zero. $\Delta COB\_BON_{i,t,t-1}$ is changes in cash bonus payments to COB of firm i from period t-1 to t, scaled by total cash compensation to COB period t; $\Delta CEO\_BON_{i,t,t-1}$ is changes in cash bonus payment to CEO of firm i from period t-1 to t, scaled by total cash compensation to CEO period t; $\Delta CFO\_BON_{i,t,t-1}$ is changes in cash bonus payment to CFO of firm i from period t-1 to t, scaled by total cash compensation to CFO period t; $COB\_COSTOCK_{i,t}$ is number of conditional stocks held by COB of firm i time t, scaled by number of common stocks held by COB at time t; $CEO\_COSTOCK_{i,t}$ is number of conditional stocks held by CEO of firm i time t, scaled by number of common stocks held by CEO at time t; $CFO\_COSTOCK_{i,t}$ is number of conditional stocks held by CFO of firm i time t, scaled by number of common stocks held by CFO at time t; $COB\_OPT_{i,t}$ is number of executive stock options held by COB of firm i time t, scaled by number of common stocks held by COB at time t; $CEO\_OPT_{i,t}$ is number of executive stock options held by CEO of firm i time t, scaled by number of common stocks held by CEO at time t; $CFO\_OPT_{i,t}$ is number of executive stock options held by CFO of firm i time t, scaled by number of common stocks held by CFO at time t; $BATH_{i,t}$ is changes in pre-impairment earnings of firm i from period t-1 to t, scaled by total assets at time t-1, when below the median of nonzero negative values of this variable; otherwise 0; $SMOOTH_{i,t}$ is changes in pre-impairment earnings of firm i from period t-1 to t, scaled by total assets at time t-1, when above the median of nonzero positive values of this variable; otherwise 0; $\Delta COB_{i,t}$ equals 1 if firm i changes COB in period t; otherwise 0; $\Delta CEO_{i,t}$ equals 1 if firm i changes CEO in period t; otherwise 0; $\Delta CFO_{i,t}$ equals 1 if firm i changes CFO in period t; otherwise 0; $DEBT_{i,t}$ is pre-impairment debt-to-equity ratio of firm i, period t; $lnSIZE\_MV_{i,t}$ is natural logarithm of equity-market value of firm i time t; $lnBOARD\_SIZE_{i,t}$ is natural logarithm of number of board members of firm i time t; $NONEXE_{i,t}$ is number of independent non-executive directors in firm i time t, scaled by total number of board members of firm i time t; $lnBOARD\_MEET_{i,t}$ is natural logarithm of number of board meetings of firm i time t; $COB\_STOCK_{i,t}$ is number of common stocks held by COB of firm i time t, scaled by total number of outstanding common stocks of firm i time t; $CEO\_STOCK_{i,t}$ is number of common stocks held by CEO of firm i time t, scaled by total number of outstanding common stocks of firm i time t; $CFO\_STOCK_{i,t}$ is number of common stocks held by CFO of firm i time t, scaled by total number of outstanding common stocks of firm i time t; $ACCEXP_{i,t}$ equals 1 if firm i time t has at least one audit-committee member being financial-accounting expert; otherwise 0; $lnAUDIT\_SIZE_{i,t}$ is natural logarithm of number of audit-committee members of firm i time t; $lnAUDIT\_MEET_{i,t}$ is natural logarithm of number of audit-committee meetings of firm i time t; $BLOCK\%_{i,t}$ is cumulative percentage of outstanding common stocks held by blockholders owning at least 5% of outstanding common stocks of firm i time t; $lnBLOCK\_NUM_{i,t}$ is natural logarithm of number of blockholders owning at least 5% of outstanding stocks of firm i time t; $CROSS_{i,t}$ equals 1 if firm i is cross-listed on the New York Stock Exchange or the NASDAQ Stock Exchange time t; otherwise 0. *indicates significant at 10% level (two-tailed), **indicates significant at 5 % level (two-tailed), *** indicates significant at 1% level (two-tailed). To investigate the effect of outliers, all the continuous variables are winsorised at 5^{th} and 95^{th} percentile.

Appendix C – Value-relevance regressions

The price-level regression is typically motivated by the Feltham-Ohlson and the Ohlson model. These models are based on the dividend-discount model which can be expressed as follows:

$$P_t \quad = \quad \sum_{\tau=1}^{\infty} \frac{E[d_{t+\tau}]}{(R_k)^{\tau}}$$

where

P_t = Market price of equity at time t.

d_t = Net dividends paid at time t.

R_k = Discount factor, one plus the discount rate.

The market price is the equilibrium, no-arbitrage market price. The clean-surplus assumption is employed to establish the relationship between accounting numbers and dividends. This assumption states that changes in book equity values equal net earnings less net dividends:

$$y_{t-1} \quad = \quad y_t + d_t - x_t \qquad [x1]$$

where

y_{t-1} = Book equity value at time *t-1*.
y_t = Book equity value at time *t*.
d_t = Net dividends paid at time *t*.
x_t = Net earnings of period *t*.

Net dividends might be written as:

$$d_t \quad = \quad x_t - (y_t - y_{t-1}) \qquad [x2]$$

Abnormal earnings, x_t^a, at time *t*, are defined as net earnings less the required rate of return on book equity value at time *t-1*:

$$x_t^a \quad = \quad x_t - (R_k - 1)y_{t-1} \qquad [x3]$$

By combining [x2] and [x3], net dividends at time *t*, d_t, can be determined entirely by accounting numbers and the discount factor:

$$d_t \quad = \quad x_t^a + R_k y_{t-1} - y_t \qquad [x4]$$

By assuming that the time horizon is $t+\tau$ and that the remaining book equity value at time $t+\tau$ will be paid out to the shareholders, the dividend-discount model may be converted to:

$$P_t = \frac{E_t[d_{t+1}]}{R_k} + \frac{E_t[d_{t+2}]}{(R_k)^2} + ... + \frac{E_t[d_{t+\tau}]}{(R_k)^\tau} + \frac{E_t[y_{t+\tau}]}{(R_k)^\tau} \quad [x5]$$

$$P_t = \frac{E_t[x^a_{t+1} + R_k y_t - y_{t+1}]}{R_k} + \frac{E_t[x^a_{t+2} + R_k y_{t+1} - y_{t+2}]}{(R_k)^2} + ... + \frac{E_t[x^a_{t+\tau} + R_k y_{t+\tau-1} - y_{t+\tau}]}{(R_k)^\tau} + \frac{E_t[y_{t+\tau}]}{(R_k)^\tau} \quad [x6]$$

$$P_t = \frac{E_t[x^a_{t+1} + R_k y_t - y_{t+1}]}{R_k} + \frac{E_t[x^a_{t+2} + R_k y_{t+1} - y_{t+2}]}{(R_k)^2} + ... + \frac{E_t[x^a_{t+\tau} + R_k y_{t+\tau-1} - y_{t+\tau}]}{(R_k)^\tau} + \frac{E_t[y_{t+\tau}]}{(R_k)^\tau} \quad [x7]$$

By distributing the expectation notation and splitting up the fractions by their numerators, the value of the firm can simply be written as the book equity value at time *t* plus the present value of the firm's expected abnormal earnings.

$$P_t = \frac{E_t[x^a_{t+1}]}{R_k} + \frac{R_k E_t[y_t]}{R_k} - \frac{E_t[y_{t+1}]}{R_k} + \frac{E_t[x^a_{t+2}]}{(R_k)^2} + \frac{R_k E_t[y_{t+1}]}{(R_k)^2} - \frac{E_t[y_{t+2}]}{(R_k)^2} + ... + \frac{E_t[x^a_{t+\tau}]}{(R_k)^\tau} + \frac{R_k E_t[y_{t+\tau-1}]}{(R_k)^\tau} - \frac{E_t[y_{t+\tau}]}{(R_k)^\tau} + \frac{E_t[y_{t+\tau}]}{(R_k)^\tau} \quad [x8]$$

The final term $\frac{E_t[y_{t+\tau}]}{(R_k)^t}$ is assumed to be zero which yields:

$$P_t = E_t[y_t] + \frac{E_t[x^a_{t+1}]}{R_k} + \frac{E_t[x^a_{t+2}]}{(R_k)^2} + ... + \frac{E_t[x^a_{t+\tau}]}{(R_k)^\tau} \quad [x9]$$

Given $E_t[y_t] = y_t$ and an infinite time horizon, [x8] can be written as:

$$P_t \qquad = \qquad y_t + \sum_{\tau=1}^{\infty} \frac{E\left[x_{t+\tau}^a\right]}{(R_k)^\tau} = y_t + \sum_{\tau=1}^{\infty} \frac{E\left[x_t - (R_k - 1)y_{t-1}\right]}{(R_k)^\tau}$$

This model expresses the market price of the firm as the sum of the firm's book equity value and the present value of expected abnormal earnings. The model is known as the Feltham-Ohlson model. Ohlson (1995) assumes that abnormal earnings follow a simple autoregressive process:

$$x_{t+1}^a \qquad = \qquad \omega x_t^a + \upsilon_t + \varepsilon_{t+1} \qquad [x10]$$

where

x_{t+1}^a = Abnormal earnings of period *t+1*.

x_t^a = Abnormal earnings of period *t*.

υ_t = Non-accounting information at time *t*.

ω = Persistence parameter of abnormal earnings; $0 \leq \omega < 1$.

ε_{t+1} = Error term at time *t+1*, zero-mean value.

The persistence parameter is set between $0 \leq \omega < 1$ which means that abnormal earnings will eventually converge to zero from its current level. If non-accounting information is set equal to zero, one unit of abnormal earnings in period *t* will lead to the following series of future abnormal earnings:

$$\sum_{i=1}^{\infty} \omega^i = \omega + \omega^2 + \omega^3 + ... \qquad [x11]$$

The discounted value of this series equals the effect of one unit abnormal earnings at time *t* on the market price at time *t*:

$$\frac{\omega}{R_k} + \left(\frac{\omega}{R_k}\right)^2 + \left(\frac{\omega}{R_k}\right)^3 + \ldots = \sum_{i=1}^{\infty}\left(\frac{\omega}{R_k}\right)^i = \frac{\omega}{(R_k - \omega)} \qquad [x11]$$

The sum of the geometric series, $\frac{\omega}{(R_k - \omega)}$, is termed the abnormal-earnings multiplier α_1.

Non-accounting information is assumed to follow an autoregressive process similar to abnormal earnings:

$$\upsilon_{t+1} \quad = \quad \gamma\upsilon_t + \eta_{t+1} \qquad [x12]$$

where

υ_{t+1}	=	Non-accounting information at time *t+1*.
υ_t	=	Non-accounting information at time *t*.
γ	=	Persistence parameter of υ; $0 \le \gamma < 1$.
η_{t+1}	=	Error term at time *t+1*, zero-mean value.

The effect on market price at time *t* of one unit υ_t equals the following multiplier:

$$\frac{1}{R_k}\left(1 + \frac{\omega}{(R_k - \omega)}\right)\left(1 + \frac{\gamma}{R_k - \gamma}\right) = \frac{R_k}{(R_k - \omega)(R_k - \gamma)} \qquad [x13]$$

This is termed the "other information" multiplier α_2. By using the Feltham-Ohlson model and the multipliers α_1 and α_2 in [x11] and [x13], the following equation is derived:

$$P_t = y_t + \sum_{\tau=1}^{\infty} \frac{E\left[x^a_{t+\tau}\right]}{(R_k)^\tau} = y_t + \frac{\sum_{\tau=1}^{\infty} E\left[\omega x^a_{t+\tau} + \upsilon_{t+\tau} + \varepsilon_{t+\tau}\right]}{(R_k)^\tau} = \qquad \text{[x14]}$$

$$y_t + \frac{\sum_{t=1}^{\infty} E\left(\omega x^a_{t+\tau}\right)}{(R_k)^\tau} + \frac{\sum_{t=1}^{\infty} E\left(\upsilon_{t+\tau}\right)}{(R_k)^\tau} + \frac{\sum_{t=1}^{\infty} E(\varepsilon_{t+\tau})}{(R_k)^\tau}$$

$\varepsilon_{t+\tau}$ is assumed to be a zero-mean error term: $E(\varepsilon_{t+\tau}) = 0$.

Since $\frac{\sum_{t=1}^{\infty} \omega E\left(x^a_{t+\tau}\right)}{(R_k)^\tau}$ equals $\frac{\omega}{(R_k - \omega)} x^a_t$ and $\frac{\sum_{t=1}^{\infty} E\left(\upsilon_{t+\tau}\right)}{(R_k)^\tau}$ equals $\frac{R_k}{(R_k - \omega)(R_k - \gamma)} \upsilon_t$, this yields:

$$P_t = y_t + \alpha_1 x^a_t + \alpha_2 \upsilon_t \qquad \text{[x15]}$$

where

$$\alpha_1 = \frac{\omega}{(R_k - \omega)}$$

$$\alpha_2 = \frac{R_k}{(R_k - \omega)(R_k - \gamma)}$$

By using the definition of abnormal earnings [x3] and the clean-surplus assumption [x1], the market price at time *t* can be expressed as:

$$
\begin{aligned}
P_t &= y_t + \alpha_1 x_t^a + \alpha_2 \upsilon_t = \\
&y_t + \alpha_1 x_t - \alpha_1 (R_k - 1) y_{t-1} + \alpha_2 \upsilon_t = \\
&y_t + \alpha_1 x_t - \alpha_1 (R_k - 1)[y_t + d_t - x_t] + \alpha_2 \upsilon_t = \\
&y_t + \alpha_1 x_t - \alpha_1 (R_k y_t + R_k d_t - R_k x_t - y_t - d_t + x_t) + \alpha_2 \upsilon_t = \\
&\alpha_1 R_k x_t + \alpha_1 d_t (1 - R_k) + \alpha_1 y_t (1 - R_k) + y_t + \alpha_2 \upsilon_t = \\
&(R_k - 1)\alpha_1 [\frac{R_k}{(R_k - 1)} x_t - d_t] + [1 - (R_k - 1)\alpha_1] y_t + \alpha_2 \upsilon_t
\end{aligned}
\qquad [x16]
$$

By substituting $\frac{R_k}{(R_k - 1)}$ with φ and $(R_k - 1)\alpha_1 = \frac{(R_k - 1)\omega}{(R_k - \omega)}$ with k, the following equation known as the Ohlson model is derived:

$$
P_t = k(\varphi x_t - d_t) + (1 - k) y_t + \alpha_2 \upsilon_t \qquad [x17]
$$

This model is based solely on net earnings, book equity value and other non-accounting information as explanatory variables of firm value. By substituting y_t with the right hand side of [x1] solved for y_t and substituting x_{t+1}^a with the right hand side of [x3], the following expression is derived:

$$P_t = y_t + \alpha_1 x_t^a + \alpha_2 \upsilon_t \qquad [x18]$$

$$P_t = y_{t-1} + x_t - d_t + \alpha_1 [x_t - (R_k - 1) y_{t-1}] + \alpha_2 \upsilon_t$$

$$P_t + d_t = (1+\alpha_1) x_t + [1 - \alpha_1 (R_k - 1)] y_{t-1} + \alpha_2 \upsilon_t$$

where

$$\alpha_1 = \frac{\omega}{(R_k - \omega)}$$

$$\alpha_2 = \frac{R_k}{(R_k - \omega)(R_k - \gamma)}$$

The above valuation model suggests the following regression specification:

$$P_t + d_t = \beta_0 + \beta_1 x_t + \beta_2 y_{t-1} + \beta_3 \upsilon_t + \varepsilon_t$$

If the linear dynamics of abnormal earnings and non-accounting information are met, the regression-coefficient estimates, β_1 and β_2, can be interpreted as estimates of $(1+\alpha_1)$ and $[1-\alpha_1(R_k - 1)]$, respectively. Thus, the estimate of β_1 is believed to be a function of the persistence parameter of abnormal earnings, ω, and the discount factor R_k. β_2 on the other hand is believed to be a function of the persistence parameter of abnormal earnings, ω, the discount factor, R_k, and the persistence parameter of non-accounting information γ.

The return specification can also be justified with reference to the Ohlson model. This model will rest on the assumption of clean-surplus accounting and the linear dynamics of the Ohlson model. An appropriate starting point is equation [x17] above:

$$P_t = (1-k)y_t + k(\varphi x_t - d_t) + \alpha_2 \upsilon_t$$

where

$$\varphi = \frac{R_k}{(R_k - 1)}$$

$$k = (R_k - 1)\alpha_1 = \frac{(R_k - 1)\omega}{(R_k - \omega)}$$

$$\alpha_2 = \frac{R_k}{(R_k - \omega)(R_k - \gamma)}$$

Substituting φ with $\frac{R_k}{(R_k - 1)}$ and k with $(R_k - 1)\alpha_1$, yields the following equation:

$$P_t = [1 - (R_k - 1)\alpha_1]y_t + \alpha_1 (R_k - 1)[\frac{R_k x_t}{(R_k - 1)} - d_t] + \alpha_2 \upsilon_t \qquad [xx1]$$

Returns might be calculated as follows:

$$R_t = \frac{P_t + d_t - P_{t-1}}{P_{t-1}} \qquad [xx2]$$

Substituting P_t in [xx2] with the right hand side of [xx1], yields:

$$R_t = \frac{[1-(R_k-1)\alpha_1]y_t + \alpha_1(R_k-1)\left[\frac{R_k x_t}{(R_k-1)} - d_t\right] + \alpha_2\upsilon_t + d_t}{P_{t-1}} - \frac{\left[[1-(R_k-1)\alpha_1]y_{t-1} + \alpha_1(R_k-1)\left[\frac{R_k x_{t-1}}{(R_k-1)} - d_{t-1}\right] + \alpha_2\upsilon_{t-1}\right]}{P_{t-1}} \quad \text{[xx3]}$$

$$R_t = \frac{[1-(R_k-1)\alpha_1](y_t - y_{t-1}) + \alpha_1 R_k(x_t - x_{t-1})}{P_{t-1}} - \frac{\alpha_1(R_k-1)(d_t - d_{t-1}) + \alpha_2\Delta\upsilon_{t,t-1}}{P_{t-1}} \quad \text{[xx4]}$$

$$R_t = \frac{[1-(R_k-1)\alpha_1](y_t - y_{t-1} + d_t)}{P_{t-1}} + \frac{\alpha_1 R_k(x_t - x_{t-1}) - \alpha_1(R_k-1)(d_t - d_{t-1}) + \alpha_2\Delta\upsilon_{t,t-1}}{P_{t-1}} \quad \text{[xx5]}$$

Equation [xx5] implies that return is explained by changes in book equity values, changes in net earnings, changes in dividends and changes in non-accounting information. Substituting $y_t - y_{t-1} + d_t$ (equation [x1]) with x_t, and $(R_k - 1)\alpha_1$ with k, the following return equation is derived:

$$R_t = \frac{(1-k)x_t + (k+\alpha_1)\Delta x_{t,t-1} + (k+\alpha_1)d_{t-1} + \alpha_2\Delta\upsilon_{t,t-1}}{P_{t-1}} \quad \text{[xx6]}$$

Equation [xx6] shows that return is explained by levels of net earnings period t, changes in net earnings form period *t-1* to period t, net dividends at time *t-1* and changes in non-accounting information from time *t-1* to time t. The weights of net earnings, changes in net earnings and lagged dividends may be expressed as follows:

$$(1-k) \quad = \quad \frac{R_k(1-\omega)}{R_k-\omega}$$

$$(k+\alpha_1) \quad = \quad \frac{R_k\omega}{R_k-\omega}$$

If the abnormal-persistence parameter equals 1 and non-accounting information is ignored, return will be explained by changes in net earnings and lagged dividends. In contrast, if the abnormal-persistence parameter equals 0 and non-accounting information is ignored, return will be explained by current earnings alone. Equation [xx6] suggests the following regression specification:

$$R_t \quad = \quad \beta_0 + \beta_1 x_t + \beta_2 \Delta x_{t,t-1} + \beta_3 d_{t-1} + \beta_4 \Delta \upsilon_{t,t-1} + \varepsilon_t$$

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