Essays on Private Equity

Vinten, Frederik

Document Version
Final published version

Publication date:
2008

License
Unspecified

Citation for published version (APA):
Vinten, F. (2008). *Essays on Private Equity*. Copenhagen Business School [Phd]. PhD series No. 1.2008

Essays on Private Equity

Frederik Christian Vinten

Essays on Private Equity

ISSN 0906-6934
ISBN 978-87-593-8346-9

PhD School in Economics and Business Administration
CBS / Copenhagen Business School

PhD Series 1.2008

Essays on Private Equity

Frederik Christian Vinten

Essays on Private Equity

CBS / Copenhagen Business School
PhD School in Economics and Business Administration
PhD Series 01.2008

Frederik Christian Vinten
Essays on Private Equity
1. edition 2008
PhD Series 1.2008

ISBN: 978-87-593-8346-9
ISSN: 0906-6934

Distributed by:

Samfundslitteratur Publishers
Rosenørns Allé 9
DK-1970 Frederiksberg C
Tlf.: +45 38 15 38 80
Fax: +45 35 35 78 22
forlagetsl@sl.cbs.dk
www.samfundslitteratur.dk

CONTENTS

Preface

This thesis 'Essays on Private Equity' marks the final end of my Ph.D. studies in Economics at Copenhagen Business School (CBS). The thesis consists of three empirical studies on the private equity market and the studies are self-contained such that each of the three essays in the thesis can be read independently.

I would like to take this opportunity to thank family, friends and colleagues for support and encouragement throughout the project. The three essays have benefited greatly from comments and suggestions from a number of persons and they are mentioned in each essay, but a few deserve more than a general word of thanks.

First of all, I am indebted to my supervisor Morten Bennedsen for his invaluable guidance and help throughout my years as a Ph.D. student. Furthermore, I thank my colleagues at Department of Economics and Centre for Economic and Business Research (CEBR) at CBS for contributing to an inspiring and stimulating research environment. In particular, I thank Kasper Meisner Nielsen, Christian Scheuer, Esben Anton Schultz and Steen Thomsen for many helpful comments, discussions and suggestions and laughs. I also wish to thank the Polaris Private Equity team for providing me with a good insight on the private equity industry, together with many good discussions and useful suggestions.

During my studies I had the opportunity to spend a great half year at Department of Finance, Leonard N. Stern School of Business, New York University. I am especially grateful to Daniel Wolfenzon for making the stay possible. I also thank Oticon Fonden, Rudolph Als Fondet, Nordea Fonden and Morten Bennedsen for sponsoring part of my stay in New York.

Throughout my Ph.D. studies I have found presenting my work at workshops and conferences together with participating in Ph.D. courses to be extremely rewarding. I would like to thank the Department of Economics, CBS, for making this financially possible. I have also enjoyed my teaching activities at CBS and thank Lisbeth la Cour,

Pascalis Raimondos-Møller and Jan Rose Skaksen for providing me with good premises in preparation for the classes.

Last but not least, I am indebted to my parents, Gurli and Jørgen, for their continued support and help.

Frederik Christian Vinten
Copenhagen, November, 2007

Introduction

There has been a wave of private equity (PE) investments the recent years. Both USA and Europe has experienced increases in number and volume of going private transactions and in the related PE fund buyouts[1] – as a joint term these are called PE transactions in this section. To illustrate this, my own calculation suggests that around 30% of all listed European firms have been delisted during 1995-2005 and about 40% of these have been going private transactions. Note that several PE industry statistics are published, however, the numbers varies substantially and it is difficult to assess which is the better. Statistics from the European Private Equity & Venture Capital Association (EVCA) reports that the capital committed to private equity investments in Europe surged to €145 billions in 2006 compared to €46 billions in 1997.[2] Other numbers illustrate that the value of PE deals have so far in 2007 accounted for almost 30% of all takeover deals worldwide.[3] EVCA also document that European buyout investments accounted for 0.1% of GDP in 2001 while increased to 0.5% in 2006.

Since the PE market accounts for a larger fraction of the total economy the understanding of this market is without doubt important. Naturally, it raises the question - what can explain the recent wave of PE transactions? Among several suggestions this thesis focuses on examining three explanations related to the weakness of public-equity markets. Firstly, the main argument is that PE transactions improve firm efficiency since value destroyed (especially in public firms) by agency problems are captured by this new owner. This argument relates to several theoretical studies have investigated the benefits of a concentrated ownership (e.g. Coase, 1937; Fama and Jensen, 1983; Grossman and Hart, 1980; Jensen and Meckling, 1976; Jensen, 1986a, 1986b, 1989a; Aghion and Bolton, 1992). The ownership model implemented by e.g. buyout funds has hence been claimed to be superior (also known as the "Jensen hypothesis"). It would imply that more PE transactions eventually lead to better governed companies due to fewer firm-level principal-agent problems. The first essay investigates whether firm efficiency improves in these firms.

[1] Source: Thomson Financial.
[2] Source: www.evca.com.
[3] Source: Thomson Financial.

Secondly, it has been claimed that the PE buyout activity has been a response to corporate governance regulation. Even though corporate governance regulation should improve markets there has actually been a global wave of delistings simultaneously with several regulatory initiatives, for example the Sarbanes-Oxley act (USA, 2002), the Higgs report (United Kingdom, 2003) and the Nørby committee (Denmark, 2001). These initiatives were likely prompted by a number of large corporate scandals such as Enron (2001), WorldCom (2002) and Parmalat (2003). Obviously, the aim of this regulation has been to improve market conditions and transparency. Thus, corporate governance regulation potentially erodes several market governance problems it may however also introduce different disadvantages (e.g. Pagano and Volpin, 2001, 2005a, 2005b; Rajan and Zingales, 2003; Perotti and von Thadden, 2006; Roe, 2006). Particularly publicly-traded firms would be affected by this. If the costs of investor protection, which is the main legal approach to corporate governance (Shleifer and Vishny, 1997), outweigh the benefits it may influence listed companies to go private. Thus, increased regulation could have triggered the recent going private wave. This is investigated in the second essay.

It could also be that going private transactions are spurred by stock market valuations. In line with this the behavioural view from the mergers and acquisitions (M&A) literature argue that inefficient markets lead to misvaluations, i.e. deviations between market and fundamental values of firms, and these misvaluations may drive delistings. In the existing literature (e.g. Shleifer and Vishny, 2003; Rhodes-Kropf and Viswanathan, 2004; Rhodes-Kropf et al., 2005; Ang and Chen, 2007) it is commonly held that overvaluation drives M&A. However, it is not clear whether market misvaluations justify the latter wave of going private transactions (e.g. PE fund buyouts). This is analyzed in essay three. Remark, that our studies (essay 2 and 3) are the first comprehensive studies of delistings in Europe.

The present thesis contains three essays and examines whether these three explanations constitute evidence for the current wave of PE transactions by testing the superior governance model of PE buyout fund owned firms, and also investigates whether

corporate governance regulation or market valuation errors explains the latter wave of going private transactions. In the first essay *'The Performance of Private Equity Buyout Fund Owned Firms'* it is tested whether the superior governance could contribute to changes in firm performance. Specifically, using Danish data 1991-2004 it is tested whether PE buyout fund ownership through their governance model in so-called portfolio firms increases firm efficiency. The somewhat surprising finding is that PE buyout fund ownership is associated with lower firm performance relatively to comparable firms, and thereby the superiority of the PE buyout fund governance model is not present in this data. Hence, no measurable gains on firm performance from elimination of principal-agent problems are found. However, other studies from the USA and U.K. has previously found support for this governance model (e.g. Kaplan, 1989a; Lichtenberg and Siegel, 1990; Muscarella and Vetsuypens, 1990; Smith, 1990; Wright et al., 1992; Wright et al., 1997; Harris et al., 2005; Cao and Lerner, 2006; Cressy et al., 2007).

Essay two *'Delistings in Europe and the Costs of Governance'* (co-authored with Steen Thomsen) examines whether going private transactions are caused by corporate governance regulation. Using European data from 1996-2004 it is documented that stronger investor protection regulation (the investor protection index constructed by La Porta et al. (1998) and updated by Pagano and Volpin (2005b)) leads to a higher delisting frequency both by M&A (corporate acquirers) and going private transactions (e.g. PE fund buyouts, incumbent management buyouts etc.). This result continues to hold when we take into consideration that investor protection policy may be endogenous. Conversely, we found that better general legal infrastructure (index constructed by the World Bank, Kaufman et al. (2005, 2006)) is associated with lower going private rates. This study somewhat supports related findings from the USA since they find that the Sarbanes-Oxley act has lead more firms to deregister (Block, 2004; Engel et al., 2005; Marosi and Massoud, 2005; Kamar et al., 2006). Hence, this study indicates that stronger investor protection could explain the latter delisting wave. Indicating that investor protection is not only beneficial, it may come with a cost as well.

In the third essay *'Equity Market Timing and the Decision to Delist'* (co-authored with Steen Thomsen) we examine whether the delisting decision is influenced by firm value fluctuations using European data from 1996-2004. Previous research has shown that M&A occur more often when market valuations (and industry market valuations) are high. This is paradoxical since it implies that companies are more likely to engage in M&A when it is most expensive. When market valuations are high it may be a sign of market misvaluations. In accordance with prior research (e.g. Maksimovic and Phillips, 2001; Shleifer and Vishny, 2003; Rhodes-Kropf and Viswanathan, 2004; Rhodes-Kropf et al., 2005; Ang and Chen, 2007) we find that delistings by M&A are more likely when industry market-to-book values are high. On the other hand, we find no effect of industry market-to-book values on going private transactions. It seems like private non-corporate buyers are less sensitive to valuation errors as are corporate buyers. This is the first study to demonstrate that going private transactions appear to be driven by causal mechanisms different from those determining M&A. There are several possible explanations for these differences. One is that acquiring listed companies find it easier to finance acquisitions when market values are high while private non-corporate buyers are less sensitive to fluctuations in market valuations because they are not listed. Or that going private investors are better at evaluating real firm value. The data also suggest that M&A are more likely to take place in bull years (where stock prices are high) while going private transactions are relatively more likely in bear years (where stock prices are low).

Perspectives

The present thesis investigates some potential weaknesses of the public equity market. In the late 1980s Jensen (1989b) claimed that the public company had outlived its usefulness and the emergence of PE buyout fund ownership was and is a response to this. Different theoretical arguments and empirical findings support that PE buyout fund ownership is an efficient ownership form. However, using Danish data my results contradict the majority of related studies since no evidence of superiority of PE buyout fund ownership is found. This indicates that the private firm (or more specific PE buyout fund ownership) is not necessarily organizationally superior to the public firm. Different arguments could explain the mixed empirical results from the literature. For

instance the PE buyout markets may vary at the country level due to countries being at different saturation. The PE buyout market took off in the 1980s in U.S., then it moved to Europe and lately the Asian PE buyout market has emerged. Thus the PE buyout market in the U.S. is presumably more mature compared to for instance the Danish market. Furthermore, countries have different structural settings. Some countries have traditionally many family owned businesses (concentrated ownership structure) such as Denmark and other continental European countries (e.g. Faccio and Lang, 2002), whereas the U.S. has relatively few family firms (dispersed ownership structure). These differences could have implications for how successful the PE buyout fund ownership model is.

Gains from operational improvements at the portfolio firm level are not the only way PE buyout funds could generate large returns for their own investors. If they are good merchants it should be possible to obtain large returns from the timing of entry and exit in portfolio firms. According to our study at least private investors (including PE buyout funds) are less sensitive to market valuation errors and these investors seems to time their investments better. However, these returns could be squeezed by the immense activity at the market for corporate deals since it put an upward pressure on firm prices. This might well apply in the current situation. Finally, the buyout activity has been highly correlated with the current credit bubble. However, interest rates have lately been increasing which could dampen the future buyout market.

Another caveat with the public equity market is that regulation is needed to protect minority investors. The lessons learned from earlier corporate scandals lead to a wave of new governance rules and standards. It has been argued that regulation comes with costs as well as benefits and our study indicates that regulation has gone too far. We are not able to calculate the exact costs of corporate governance but a related study from the U.S. shows that the average listing costs of a large company has increased by approximately 50% due to the Sarbanes-Oxley act (Zhang, 2005). Again there are country differences in the institutional settings meaning that ‘one size does not fit all’. The design of a country’s corporate governance rules and standards should be carefully determined and not directly copied from otherwise similar countries.

Even though disadvantages of public equity markets have attracted much attention they also confer several advantages. The advantages of being listed are numerous - external financing, reputation motives etc. A stock exchange also maintains a relatively transparent market place which is attractive for most companies. Initial public offerings (IPOs) may also be the optimal way for PE buyout funds to exit the portfolio firms especially when the current credit market situation is taking into consideration. Thereby PE buyout funds feed the public equity market with IPOs. Curiously several buyout funds are also currently going public – so PE buyout funds which allegedly originated from the weakness of public equity markets are now themselves becoming part of the public equity market, also suggesting that the benefits of being listed might outweigh the costs for firms with special needs.

Summary

English summary

Essay 1: The Performance of Private Equity Buyout Fund Owned Firms

Over the last thirty years PE buyout funds have become responsible for a larger and increasing quantity of investments in the global economy. Although it has been claimed that this new type of owner generates economic efficiency through superior governance (e.g. Jensen, 1986a, 1989a, 2007; Jensen et al., 2006) few studies test this claim. The purpose of this paper is on assessing the superiority of the PE buyout fund governance model.

Hence, this paper addresses the issues of how PE buyout fund ownership affects post-buyout firm performance (portfolio firms) and whether the claimed superior governance model is able to explain the empirical findings. The governance model is tested by assessing associations between changes in ownership structure and/or changes in debt structure affect firm performance. It is also tested whether stakeholder expropriation is present in data by assessing the dividend policy and layoffs. These three approaches are denoted the ownership, debt and the stakeholder expropriation hypotheses' respectively (e.g. Grossman and Hart, 1980; Jensen, 1986a, 1986b, 1989a; Shleifer and Summers, 1988; Aghion and Bolton, 1992; Renneboog and Simons, 2005).

The analysis is performed on a dataset of 73 buyouts which took place in Denmark during 1991-2004 which are matched on the basis of ownership change, industry and size with a control group of 545 firms. The data cover firm level financial information from *Købmandsstandens Oplysningsbureau* (KOB). Surprisingly the main finding is that post-buyout performance of portfolio firms falls. In addition, it is found: 1) that performance was improved through better monitoring of management possibly resulting from less separation of ownership and control *(the ownership effect)*. However, the data show a post-buyout fall in ownership concentration which could explain the lower performance; 2) On the contrary, little evidence is found of that *debt* monitoring improves firm performance *(the debt effect)*. However, it does seem like debt with shorter maturity have a positive monitoring effect; 3) the dividend policy within portfolio firms is much more favourable and sensitive compared to the benchmark firms, i.e. pay out higher dividends. This result suggests that owners behave in an opportunistic manner which arguably could be costly for other stakeholders and the portfolio firm in the long term (*the expropriation effect*). However there is not found evidence of layoffs. Overall, the predicted effects of the superior governance model of PE buyout fund ownership do not seem to appear in the data.

One explanation of this finding could be that the vast majority of these deals have been private-to-private transactions where the benefits of PE fund ownership are supposedly less. Therefore Denmark illustrates a common feature of continental European countries, i.e. the presence of many closely-held private companies where benefits of the PE fund ownership model are less clear.

Essay 2: Delistings in Europe and the Costs of Governance
(Co-authored with Steen Thomsen)

In this paper we examine whether the increase in recent years delistings is attributed to increasing governance costs for listed companies. For example, if new corporate governance regulation – e.g. investor protection or codes – increase bureaucracy and transaction costs without adding sufficient value to minority investors – it may be

profitable to take companies private or to merge them to spread the fixed costs of governance over a greater volume (e.g. Pagano and Volpin, 2001, 2005a, 2005b; Rajan and Zingales, 2003; Perotti and von Thadden, 2006; Roe, 2006). This we would call the *overregulation hypothesis*. In contrast if the costs of corporate governance regulation are exceeded by increasing efficiency of listed companies, less expropriation of minority investors and greater transparency, companies and their owners will find it more attractive to remain listed. This we think of as the *efficiency hypothesis*.

Using data from Thomson Financial/Worldscope on all listed firms in Europe within 1995-2005 we find that better protection of minority investors (index constructed by La Porta et al. (1998) and updated by Pagano and Volpin (2005b)) appears to lead to more going private transactions. We call this measure investor protection regulation. The adoption of corporate governance codes also appears to lead to more going private transactions. This is consistent with the overregulation hypothesis. We did find some indication that better general legal infrastructure (as measured by the World Bank governance index, Kaufman et al. (2005, 2006)) was associated with fewer going private transactions, which tends to support the efficient regulation hypothesis.

It has been emphasized that corporate governance policy may be endogenously determined (e.g. Pagano and Volpin, 2001, 2005b; Rajan and Zingales, 2003; Perotti and von Thadden, 2006; Roe, 2006). This implies that statistical estimates of the effects of these policies need to take into consideration how the policies are determined. One way to solve this is to apply economic instruments which influence investor protection without possibly also influencing the going private decision. However, it is difficult to identify proper economic instruments. Nevertheless our best estimates using the legal system, voting system and unionization as instruments indicate that investor protection regulation tends to increase the frequency of going private transactions.

Obviously, we cannot deduce from this that protecting minority investors is harmful. It may be that gains in investor confidence are well worth the costs of some delisted companies. But our findings do indicate that there are costs as well as benefits to corporate governance regulation, and one of the costs is that lower private benefits of

control and more formalized corporate governance practices will lead some companies to delist. While some regulation is necessary and beneficial to stock market development, there may also be limits to regulation, for example how much minority investors should be protected in a zero sum game with other interest groups such as large shareholders, employees or creditors.

Essay 3: Equity Market Timing and the Decision to Delist
(Co-authored with Steen Thomsen)

Both in the USA and in Europe there has been an increase in delistings in recent years. From 1995 to 2005 we found that 30% of the population of listed European firms were delisted for one reason or another. In this paper we have examined the impact of stock market valuations on M&A (corporate takeovers) and going private transactions (e.g. PE fund buyouts, incumbent management buyouts etc.) on European stock exchanges over the period 1996-2004. We use firm and market level data from Thomson Financial/Worldscope on all listed firms in Europe within the mentioned period (same data as in essay 2). In accordance with previous research we have found that M&A tend to be pro-cyclical in the sense that they occur more often when industry market valuations (q values) are high (e.g. Nelson, 1959; Maksimovic and Phillips, 2001; Shleifer and Vishny, 2003; Rhodes-Kropf and Viswanathan, 2004; Rhodes-Kropf et al., 2005; Ang and Chen, 2007). We also show that this is not the case for going private transactions. Note, that high (or low) stock market valuations are also in the existing literature interpreted as market misvaluations (valuation deviates from fundamental values). Additionally, we find that M&A are more likely to take place in bull years, while going private transactions are relatively more likely in bear years. Furthermore, as expected, we found no significant industry q effect in the relatively transparent financial industries and or in large firms, where misvaluations should be minor, while the industry q effect was significant in the more transparent industries with low R&D intensities. Apparently, going private transactions and M&A are driven by different causal mechanisms. Hence M&A seems to be partly driven by misvaluations whereas going private transactions are not.

There are several possible explanations for these differences. One is that acquiring listed companies find it easier to finance acquisitions when market values are high while private non-corporate buyers are less sensitive to fluctuations in market valuations because they are not listed (can not use own stocks as payment). It could also be that going private investors (e.g. buyout funds, incumbent management etc.) are better at evaluating the real value of firms (Jensen, 2007). Finally, high stock prices may make both investors and acquiring companies more optimistic concerning the future business outlook which could make it more attractive to invest.

It is not self evident that buying cheap is equivalent to investing smart. Even if private buyers were smarter investors than companies during the boom and bust years around the millennium, some of this may be attributable to luck since private equity funds "happened" to emerge in time to profit from the bear market in 2001-2003. Alternatively, private buyers may be more focused on value creation since they represents more concentrated ownership and other governance characteristics. Moreover, private buyers may be less concerned about pre-empting competitors in bidding for acquisition targets. They can afford to participate only if they believe that the individual transaction will create value without taking into consideration repercussions on incumbent businesses.

Dansk Resumé

Essay 1: Performance i kapitalfond-ejede virksomheder

Kapitalfonde er i de senere år kommet til at udgøre en stadig større og stigende andel af investeringer i den globale økonomi. På trods af at det hævdes at denne 'nye' ejer skaber økonomisk efficiens igennem såkaldt 'overlegen' eller 'uovertruffen' *governance* (f.eks. Jensen, 1986a, 1989a, 2007; Jensen et al., 2006) har få studier undersøgt denne påstand. Formålet med dette studium er derfor at teste hvorvidt kapitalfondes *governance* model rent faktisk er 'overlegen' eller 'uovertruffen' og derved gunstig for de overtagne virksomheder.

Denne essay fokuserer således på hvorledes kapitalfond-ejerskab påvirker overtagne virksomheders performance efter opkøbet, og endvidere om hvorvidt den hævdede 'overlegne' *governance* model er i stand til at forklare de fundne empiriske resultater. *Governance* modellen testes via hvorvidt ændringer i ejer- og/eller kapitalstrukturen påvirker virksomhedens performance. Desuden undersøges det om dividendeudbetalingerne eller antallet af afskedigelser påvirkes af dette ejerskab. Dette er interessant pga. der er mulighed for at kapitalfonde eksproprierer virksomheders interessenter *(stakeholders)*. Således repræsenterer disse tre tilgange hhv. ejerskabs, gælds og eksproprierings hypoteserne (f.eks. Grossman og Hart, 1980; Jensen, 1986a, 1986b, 1989a; Shleifer og Summers, 1988; Aghion og Bolton, 1992; Renneboog og Simons, 2005).

I analysen anvendes et datasæt bestående af 73 danske opkøb (betegnes porteføljevirksomheder) i perioden 1991-2004, samt 545 kontrolvirksomheder som er matchet mht. ejerskabsændring, branche og størrelse. Datasættet fra Købmandsstandens Oplysningsbureau (KOB) indeholder virksomheders regnskabsdata. Det findes (måske) overraskende at kapitalfond-ejede virksomheder har en lavere performance efter opkøbet relativt til kontrol virksomhederne. Desuden findes: 1) at mindre adskillelse imellem ejerskabet og kontrol og således en forventet bedre monitorering af ledelsen forbedrer performance (*ejerskabs effekten)*. Dertil findes at ejerskabskoncentrationen falder efter opkøbet, hvilket derved kan være med til at forklare den lavere performance; 2) Tilgengæld finder jeg begrænset belæg for at gælds-monitorering forbedrer virksomheders performance *(gælds effekten)*. Undersøgelsen indikerer dog at gæld med kortere varighed har en positiv monitorerings effekt; 3) porteføljevirksomhedernes dividendeudbetalinger er langt mere favorable og sensitive sammenlignet med kontrolvirksomhederne, dvs. dividende udbetalingerne stiger. Dette resultat antyder at ejerne har en opportunistisk adfærd som kan være omkostningsfuld for andre interessenter/interessegrupper i virksomheden, samt for porteføljevirksomhederne på længere sigt (*eksproprierings effekten)*. Dog findes der ikke bevis for at der efterfølgende gennemsnitligt finder afskedigelser sted. Overordnet ser det ikke ud til at effekter fra denne 'overlegne' *governance* model findes i det anvendte data.

En forklaring kunne være at størstedelen af disse handler har været transaktioner af allerede privatejede virksomheder, hvor gevinsterne af kapitalfondejerskab formentligt er mindre. Derfor illustrerer Danmark et almindeligt karakteristika ved kontinental Europæiske lande, dvs. mange virksomheder med koncentreret ejerskab hvor gevinsterne af kapitalfondejerskab er mindre tydelige.

Essay 2: Børsafnoteringer i Europa og omkostningen ved Corporate Governance (i samarbejde med Steen Thomsen)

I dette studie undersøges hvorvidt stigningen i antallet af afnoteringer fra børser de seneste år kan tilskrives de øgede *governance* omkostninger for børsnoterede virksomheder. Hvis nye *corporate governance* initiativer (investor beskyttelse) f.eks. øger bureaukrati og transaktionsomkostninger uden samtidigt at tilføje tilstrækkelig værdi for minoritetsaktionærerne – kan det være gunstigt at afnotere eller fusionere virksomheder, for at sprede den faste omkostning af *governance* (f.eks. Pagano og Volpin, 2001, 2005a, 2005b; Rajan og Zingales, 2003; Perotti og von Thadden, 2006; Roe, 2006). Dette kalder vi overregulerings-hypotesen. Omvendt hvis omkostningerne ved *corporate governance* regulering overstiges af øget efficiens af noterede virksomheder, mindre ekspropriering af minoritetsaktionærer og større transparens, vil virksomheden og deres respektive ejere finde det mere attraktivt at være noterede. Dette kalder vi efficiens-hypotesen.

Vi anvender data fra *Thomson Financial/Worldscope*, som omfatter alle børsnoterede virksomheder i Europa i perioden 1995-2005. Vi finder at bedre minoritetsaktionær beskyttelse (indeks konstrueret af La Porta et al. (1998) og opdateret af Pagano og Volpin (2005b)) tilsyneladende fører til flere *going private* transaktioner. Vi kalder dette mål for investorbeskyttelses regulering. Introduktion af *corporate governance* anbefalinger/regler fører tilsyneladende også til flere *going private* transaktioner. Disse resultater er konsistente med overregulerings-hypotesen. Vi fandt dog visse indikationer af at bedre såkaldt generelt lovmæssig infrastruktur (målt vha.

Verdensbankens *governance* indeks, Kaufman et al. (2005, 2006)) fører til færre *going private* transaktioner, hvilket derved tenderer til at støtte efficiens-hypotesen.

Det hævdes at *corporate governance* regulering kan være endogent bestemt (f.eks. Pagano og Volpin, 2001, 2005b; Rajan og Zingales, 2003; Perotti og von Thadden, 2006; Roe, 2006). Dette implicerer at statistiske estimater af reguleringens effekt bør tage højde for hvorledes reguleringen er determineret. En mulig løsning er at anvende økonomiske instrumenter som påvirker investorbeskyttelse uden at påvirke afnoterings-beslutningen. Det er dog besværligt at finde egnede økonomiske instrumenter som kan anvendes. Når information omkring landes juridiske system, landes valgsystem og organiseringsgrad anvendes som instrumenter, indikerer vores bedste estimater at investorbeskyttelses regulering tenderer til at øge *going private* afnoterings-frekvensen.

Vi kan ikke alene ud fra dette udlede at minoritetsaktionær beskyttelse er skadelig. Det kan være at øget investor-tillid er mere værd end omkostningen ved afnoterede virksomheder. Men vores analyse antyder at *corporate governance* regulering medfører omkostninger såvel som gevinster, og at en af omkostningerne er at lavere private gevinster ved kontrol og mere formaliseret *corporate governance* praksis vil få nogle virksomheder til at afnotere. Alt imens en vis regulering er nødvendig og gavnlig for aktiemarkedets udvikling så er der også grænser for reguleringen. F.eks. hvor meget skal minoritetsaktionærer beskyttes i et nul-sums spil med andre interessegrupper såsom store aktionærer, medarbejdere og kreditorer.

Essay 3: Aktiemarkeds-timing og beslutningen om børsafnotering
(i samarbejde med Steen Thomsen)

Antallet af børsafnoteringer har været stigende de senere år i både USA og Europa. Vi finder at 30 procent af alle børsnoterede europæiske virksomheder blev afnoteret i perioden 1995-2005 af forskellige grunde. I dette studie undersøger vi forskellige mål for markedsværdis effekt på fusioner og virksomhedsovertagelser *(M&A)* og *going*

private transaktioner på de europæiske børser i perioden 1996-2004.[4] Vi anvender data fra *Thomson Financial/Worldscope* på virksomheds- og markedsniveau for alle børsnoterede virksomheder i Europa i nævnte periode (samme data som i essay 2). I overensstemmelse med tidligere resultater finder vi at *M&A* tenderer til at være pro-cyklisk således at de forekommer hyppigere når branchens aktiemarkeds værdi (q-værdier) er høj (f.eks. Nelson, 1959; Maksimovic og Phillips, 2001; Shleifer og Vishny, 2003; Rhodes-Kropf og Viswanathan, 2004; Rhodes-Kropf et al., 2005; Ang og Chen, 2007). Vi viser derimod også at dette ikke er tilfældet for *going private* transaktioner. Bemærk at høj (eller lav) aktiemarkeds værdi kan fortolkes, som i den relaterede litteratur, som markeds misvalueringer (valueringer som afviger fra fundamentale værdier). Endvidere finder vi at *M&A* er mere sandsynlige i perioder hvor aktiekurserne topper *(bull market)*, imens *going private* transaktioner er relativt mere sandsynlige i perioder hvor aktiekurserne er i bund *(bear market)*. Desuden, som forventet, fandt vi ingen signifikant industri q-effekt i den relativt transparente finansielle branche, samt for store virksomheder, hvor misvalueringer burde være mindre. Men industri q-effekten var dog signifikant i de mere transparente brancher med lave forsknings- og udviklingsudgifter. Derfor virker det til at *going private* transaktioner og *M&A* er drevet af forskellige kausale mekanismer. Således indikerer dette at *M&A* til dels er drevet af misvalueringer imens *going private* transaktioner ikke ser ud til at være det.

Der er flere mulige forklaringer på disse forskelle. En forklaring er at det er nemmere for børsnoterede virksomheder, der opkøber andre virksomheder (som evt. også er noterede), at finansiere disse opkøb når aktiekurserne er høje. Imens er private ikke-industrielle købere mindre sensitive overfor fluktuationer i aktiemarkedets værdi pga. de (normalt) ikke er børsnoterede, hvorfor de ikke kan bruge egne aktier som del af finansieringen. Det kan også være at going private investorer (f.eks. kapitalfonde, ledelse mv.) er bedre til at vurdere den faktiske værdi af en virksomhed (Jensen, 2007). Endvidere kan høje aktiekurser gøre opkøbere mere optimistiske angående fremtidige forretningsmæssige udsigter, hvilket derved gør det mere attraktivt at investere.

[4] *M&A* forekommer når en virksomhed afnoteres som led i en fusion eller virksomhedsovertagelse, hvor opkøber er en virksomhed. En såkaldt *going private* transaktion forekommer hvis en ikke-virksomhed overtager og afnoterer virksomhed. F.eks. dette er tilfældet hvis den siddende ledelse eller en kapitalfond opkøber en virksomhed.

Der er ikke nødvendigvis en sammenhæng mellem at 'købe billigt' og at være en dygtig investor. Selv hvis private opkøbere omkring årtusindeskiftet var dygtigere investorer end f.eks. virksomheder, så kan timingen af disse opkøb til dels tilskrives held pga. kapitalfondenes aktivitet indtraf således at de profiterede af *bear market* perioden 2001-2003. Alternativt er private virksomhedsopkøbere måske også mere fokuseret på værdiskabelse gennem et mere koncentreret og fokuseret ejerskab samt andre *governance* karakteristika. Desuden er det mindre væsentligt for private virksomhedsopkøbere at forhindre *target* virksomhedens konkurrenter i at opkøbe virksomheden. Disse private opkøbere forsøger formentligt kun at overtage en virksomhed hvis de mener, at den individuelle transaktion vil skabe værdi uden at tage hensyn til tilbageslag i værende forretning.

References

1) Aghion, P., Bolton, P., 1992. An Incomplete Contracts Approach to Financial Contracting. *Review of Economic Studies* 59, 473-494.
2) Ang, J., Cheng, Y., 2007. Direct Evidence of the Market-Driven Acquisitions Theory. *Journal of Financial Research,* forthcoming.
3) Block, S., 2004. The Latest Movement to Going Private: An Empirical Study. *Journal of Applied Finance* 14(1), 36-44.
4) Cao, J., Lerner, J., 2006. The Performance of Reverse Leveraged Buyouts. NBER Working paper no. 12626.
5) Coase, R., 1937. The Nature of the Firm. *Economica* 4, 386-405.
6) Cressy, R., Munari, F., Malipiero, A., 2007. Playing to Their Strengths? Evidence that Specialization in the Private Equity Industry Confers Competitive Advantage. *Journal of Corporate Finance*, forthcoming.
7) Engel, E., Hayes, R., Wang, X., 2005. The Sarbanes-Oxley Act and Firms' Going-Private Decisions. Working paper, University of Chicago.
8) Faccio, M., Lang, L., 2002. The Ultimate Ownership of Western European Corporations. *Journal of Financial Economics* 65, 365-395.
9) Fama, E., Jensen, M., 1983. Separation of Ownership and Control. *Journal of Law and Economics* 26, 301-325.
10) Grossman, S., Hart, O., 1980. Take-over bids, the Free-rider problem and the Theory of Corporation. *Bell Journal of Economics* 11, 42-64.
11) Harris, R., Siegel, D.S., Wright, M., 2005. Assessing the Impact of Management buyouts on Economic Efficiency: Plant-level Evidence from the United Kingdom. *Review of Economics and Statistics* 87, 148-153.
12) Jensen, M., Meckling, W., 1976. Theory of the Firm: Managerial Behaviour, Agency Costs, and Ownership Structure. *Journal of Financial Economics* 3, 303-360.
13) Jensen, M.C., 1986a. Agency Costs of Free cash flow, Corporate Finance and Takeovers. *American Economic Review* 76(2), 323-329.
14) Jensen, M., 1986b. The Takeover Controversy: Analysis and Evidence. *Midland Corporate Finance* 4(2), 6-32.

15) Jensen. M., 1989a. Active Investors, LBOs and the Privatization of Bankruptcy. *Journal of Applied Corporate Finance* 2, 35-44.

16) Jensen, M., 1989b. Eclipse of the Public Corporation. *Harvard Business Review* Sep-Oct 1989, revised 1997.

17) Jensen, M., 2007. The Economic Case for Private Equity. Harvard NOM Research Paper No. 07-02.

18) Jensen, M., Kaplan, S., Ferenbach, C., Feldberg, M., Moon, J., Hoesterey, B., Davis, C., Jones, A., 2006. Morgan Stanley Roundtable on Private Equity and its Import for Public Companies. *Journal of Applied Corporate Finance* 18(3), 8-37.

19) Kamar, E., Karaca-Mandic, P., Talley, E., 2006. Going-Private Decisions and the Sarbanes-Oxley Act of 2002: A Cross-Country Analysis. Center in Law, Economics and Organization Research paper series (no. C06-05) and Legal studies Research paper series (no. 06-10), University of Southern California.

20) Kaplan, S., 1989a. The Effects from Management Buyouts on Operations and Value. *Journal of Financial Economics* 24, 217-254.

21) Kaufman, D., Kraay, A., Mastruzzi, M., 2005. Governance Matters IV: Governance Indicators 1996-2004. Working paper, World Bank.

22) Kaufman, D., Kraay, A., Mastruzzi, M., 2006. Governance Matters V: Governance Indicators 1996-2005. Working paper, World Bank.

23) La Porta, R., Lopez-de-Silanes, F., Shleifer, A., Vishny, R., 1998. Law and Finance. *Journal of Political Economy* 106(6), 1113-1155.

24) Lichtenberg, F., Siegel, D., 1990. The Effects of Leveraged Buyouts on Productivity and Related Aspects of Firm Behaviour. *Journal of Financial Economics* 27, 165-194.

25) Maksimovic, V., Phillips, G., 2001. The Market for Corporate Assets: Who Engages in Mergers and Asset sales and are there Efficiency Gains? *Journal of Finance* 56, 2019-2065.

26) Marosi, A., Massoud, N., 2005. Why Do Firms Go Dark? *Journal of Financial and Quantitative Analysis*, forthcoming.

27) Muscarella, C., Vetsuypens, M., 1990. Efficiency and Organizational Structure: A Study of Reverse LBOs. *Journal of Finance* 45(5), 1389-1413.

28) Nelson, R., 1959. Merger Movements in the American Industry. NBER, New York.

29) Pagano, M., Volpin, P., 2001. The Political Economy of Finance. *Oxford Review of Economic Policy* 17, 502-519.

30) Pagano, M., Volpin P., 2005a. Workers, Managers, and Corporate Control. *Journal of Finance* 60, 841-868.

31) Pagano, M., Volpin, P., 2005b. The Political Economy of Corporate Governance. *American Economic Review* 95(4), 1005-1030.

32) Perotti, E., Von Thadden, E.L., 2006. The Political Economy of Corporate Control and Labor Rents. *Journal of Political Economy* 114(1), 145-174.

33) Rajan, R., Zingales, L., 2003. The Great Reversals: The Politics of Financial Development in the 20th Century. *Journal of Financial Economics* 69(1), 5-50.

34) Renneboog, L., Simons, T., 2005. Public to Private Transactions: Motives, Trends, Theories and Empirical Literature on LBOs, MBOs, MBIs and IBOs. Discussion paper CentER, Tilburg University.

35) Rhodes-Kropf, M., Viswanathan, S., 2004. Market Valuation and Merger Waves. *Journal of Finance* 59(6), 2685-2718.

36) Rhodes-Kropf, M., Robinson, D.T., Viswanathan, S., 2005. Valuation Waves and Merger Activity: The Empirical Evidence. *Journal of Financial Economics* 77, 561-603.

37) Roe, M.J., 2006. Legal Origins and Modern Stock Markets. *Harvard Law Review*, forthcoming.

38) Shleifer, A., Summers, C.H., 1988. Breach of Trust in Hostile Takeovers, chapter 2 in Auerbach, A.J., ed., Corporate Takeovers: Causes and Consequences, Chicago: University of Chicago Press.

39) Shleifer, A., Vishny R.W., 1997. A Survey of Corporate Governance. *Journal of Finance* 52, 737-783.

40) Shleifer, A., Vishny R.W., 2003. Stock Market Driven Acquisitions. *Journal of Financial Economics* 70, 295-311.

41) Smith, A., 1990. Corporate Ownership Structure and Performance. *Journal of Financial Economics* 27, 143-164.

42) Wright, M., Thompson, S., Robbie, K., 1992. Venture Capital and Management-led Leveraged buy-outs: European Evidence. *Journal of Business Venturing* 7, 47-71.

43) Wright, M., Wilson, N., Robbie, K., 1997. The Longer term Performance of Management buy-outs. *Frontiers of Entrepreneurship Research*, 555-569.

44) Zhang, I., 2005. Economic Consequences of the Sarbanes-Oxley Act of 2002. University of Rochester, Working paper.

The Performance of Private Equity Buyout Fund Owned Firms[5]

Frederik Vinten[6]
Copenhagen Business School
Centre for Economic and Business Research (CEBR)

Abstract:

This paper studies the impact of private equity (PE) buyout fund ownership on the performance of their portfolio firms. Using Danish data during 1991-2004 portfolio firms are compared to otherwise comparable firms not subjected to such an ownership change. The main finding is that PE buyout fund ownership has a significant negative effect on firm performance relatively to similar firms. This result indicates that the so-called superior corporate governance model is not consistent with the data partly because post-buyout ownership concentration falls and that debt does not lead to efficiency improvements. Moreover, a proxy for expropriation seems to be present in the data since post-buyout dividend payments increases. Alternative explanations are examined - such as selection bias, valuation bias and measurement errors – but the main finding remains unaffected.

JEL classification: G24; G32; G34
Keywords: Buyouts; Private equity; Performance; Corporate Governance

[5] I am grateful to Morten Bennedsen, and I also thank Jan Bartholdy, Mike Burkart, Morten Lund, Lisbeth la Cour, Kasper Meisner Nielsen, Steen Thomsen, Christian Scheuer, Esben Anton Schultz and seminar participants at Department of Economics, Copenhagen Business School; The PhD Workshop 2007, Danish Doctoral School of Finance; 29. Symposium i Anvendt Statistik 2007, University of Aarhus; DCGN Corporate Governance Workshop 2007, Copenhagen Business School; Nordic Finance Network Research Workshop 2007, Helsinki School of Economics. All errors are my own. PLEASE DO NOT QUOTE WITHOUT PERMISSION.
[6] Frederik Vinten, Department of Economics, Copenhagen Business School, and Centre for Economic and Business Research (CEBR). Porcelænshaven 16A, DK-2000 Frederiksberg, Denmark. E-mail: fv.eco@cbs.dk.

1. Introduction

Over the last thirty years private equity (PE) buyout funds have become responsible for a larger and increasing quantity of investments in the global economy.[7] It is therefore desirable to understand the possible impact of PE buyout fund ownership better. Although it has been claimed that this type of owner generates economic efficiency through superior governance (e.g. Jensen, 1986a, 1986b, 1989) few studies test this claim. It is also known as the "Jensen hypothesis". The buyout market has experienced two big waves. The first wave in 1980s was particularly driven by the presence of corporate inefficiencies which created the opportunity for 'corporate raiders' and industrial restructurings, leading to the so-called *rebirth of active investors*. Even though the second and current wave are different in many respects the main motivation of the PE fund buyouts is the absence of monitoring within the firms (e.g. Prowse, 1998; Brealey and Myers, 2003; Renneboog and Simons, 2005; Jensen et al., 2006).

In practice PE buyout funds are believed to create value through two channels (Jensen et al., 2006): 1) financial and governance engineering, 2) operational engineering. The benefits from financial engineering derive from disciplining and tax benefits from higher debt, and improved incentives from managerial ownership. The governance engineering derives from better control of the board and management. Jensen (2007) emphasizes it as "PE funds enable the capture of value destroyed by agency problems in public firms – especially failures in governance". The other source of value creation – operational engineering – relates to the belief that PE funds have a strong operational focus e.g. on specialization within industry knowledge and operational experience. The focus of this paper is on the first channel – the superiority of the PE fund governance model.

[7] The focus of this study is on the PE buyout industry (excluding the venture capital market) which expanded in USA back in the 1980s and moved to Europe during the late 1990s. PE funds have a limited investment horizon of 3-10 years. The organizational structure of portfolio firms normally changes because a holding company is often set up. The holding company controls the portfolio firm and is controlled by the PE fund. Notice that the focus here is on the parent company and *not* on the holding company because is a part of the economy also when the PE fund has exited. Holding companies are often liquidated after the exit. Since the focus is on the buyout market PE buyout funds are in the following denoted PE funds for simplicity.

The existing literature on estimating the economic effects of buyouts (management buyouts, leveraged buyouts, reverse leveraged buyouts) has mainly focused on the U.S. and U.K. in the 1980s and 1990s (e.g Kaplan, 1989a; Lichtenberg and Siegel, 1990; Muscarella and Vetsuypens, 1990; Smith, 1990; Wright et al., 1992; Wright et al., 1997). The majority of these studies document a positive impact of this *new* form of corporate organization measured on operating profitability and productivity within the buyout firm – either while private or after exit (Kaplan, 1989a; Lichtenberg and Siegel, 1990; Muscarella and Vetsuypens, 1990; Smith, 1990; Wright et al., 1992; Wright et al., 1997; Harris et al., 2005; Cao and Lerner, 2006; Cressy et al., 2007; Guo et al., 2007).[8] Contradicting, studies by Ravenscraft and Scherer (1987) and Desbrières and Schatt (2002)[9] document, however, a negative impact on firm performance characteristics of this ownership transition.

The existing studies are not always easy to compare because there are subjected to different biases in data selection. As mentioned the literature has investigated management buyouts (MBOs), leveraged buyouts (LBOs) and reverse LBOs (RLBOs)[10], however, studies of these transaction types are not completely comparable.

[8] Different studies have investigated how a buyout has affected firm-specific performance – either while private or public again. In the U.S. Kaplan (1989a) and Smith (1990) analyzed, respectively 48 and 58, MBOs during the 1970s and 1980s, and both found that industry-adjusted post-buyout operating profits were improved. Correspondingly, Wright et al. (1992) found improvements in profitability within 182 MBOs in U.K. during 1980s. Further, Wright et al. (1997) examined 158 buyouts U.K. in the 1980s and found superior longer term performance compared to matched non-buyout firms. In a recent study Cressy et al. (2007) studies 122 U.K. buyouts during 1995-2002. Compared to a set of matched-paired firms return on assets were improved. The study Guo et al. (2007) focus on 89 public-to-private buyouts in the US during 1990-2006. The main result is that these buyouts are either comparable or exceed benchmarks performance-wise. Other studies have investigated reverse LBOs (RLBOs), for instance Muscarella and Vetsuypens (1990) studied 72 RLBOs from the U.S. during 1980s and found that revenues and asset turnover were improved compared to a random sample of publicly traded firms. Further, Cao and Lerner (2006) investigated 496 RLBOs in the U.S. from 1980-2002 and also found a positive impact on firm performance. In this study firm stock performance is compaed to stock performance of other initial public offerings (IPOs) together with the average stock market performance. Lichtenberg and Siegel (1989) used another approach while examining post-buyout changes in total factor productivity (TFP) among 1100 U.S. plants involved in LBOs during 1980s. They found that LBO-plants had significantly higher rates of TFP growth compared with non-LBO plants. Related Harris et al. (2005) examined the impact of MBOs at plant level economic efficiency of companies in U.K. during 1990s. The data covered 979 buyouts and 4877 plants and evidence suggested that economic efficiency was improved.

[9] Other studies document a negative impact on firm performance from buyouts. Ravenscraft and Scherer (1987) investigated 95 target firms in the U.S. from the 1970s and found that post-tender profitability dropped compared to industry benchmarks. Andrade and Kaplan (1998) studies 31 highly leveraged transactions (U.S.) that became financially distressed, and suggest that operating profitability declined in these deals. Desbrières and Schatt (2002) studied 161 MBOs in France during 1988-1994 and found that post-buyout performance dropped in these.

[10] It is not necessarily the case the lead acquirer in a LBO or MBO is a PE fund. This is problematic in such analysis since the impact of PE fund ownership is not completely identified.

For example LBOs are examined while private, whereas RLBOs are analyzed after the exit. Hence, RLBOs studies therefore also reflect the impact of a new owner which is not a PE fund. Moreover, it is not always the case that the lead acquirer in LBOs or MBOs is a PE fund. Therefore there is a lack of research focusing explicitly on PE fund ownership (such as Cressy et al., 2007).

Secondly, most of the LBOs and MBOs studies have been on public-to-private transactions (e.g. Kaplan, 1989a; Smith, 1990), however, during the recent decade about 80% of the European transactions (measured in value) where private-to-private transactions.[11] The "Jensen hypothesis" indicates that private-to-private transactions should be associated with fewer agency cost savings.

Thirdly, a severe problem is to obtain data suited for empirical testing. In most countries the quality of privately-held company information is poor. Therefore most studies are subjected to sample selection limitations, for instance some studies have focused on the post-exit situation of buyout firms and not while private, i.e. RLBOs studies (Muscarella and Vetsuypens, 1990; Cao and Lerner, 2006). Further, it is typically not a full population of buyouts that are analyzed in these studies. Data limitation also relates to the fact that the majority of the literature uses aggregate industry averages as benchmarks instead of control groups of comparable firms (Kaplan, 1989a; Smith, 1990). However, Alemany and Marti (2005) and Cressy et al. (2007) introduce proper methods of obtaining accurate matched samples of non-PE backed firms.

There are three main contributions of this study: Firstly, new evidence on the recent buyout activity is provided and few studies have examined the PE buyout industry after the mid-1990s (only Cressy et al., 2007; Guo et al., 2007). A negative impact of PE fund ownership is found. As such it is (still) interesting whether this owner creates value. Moreover, different factors have changed in the more recent buyout wave such as potential transaction motivations, characteristics of target firms and transaction capital structures (Jensen et al., 2006; Guo et al., 2007). Therefore the results from recent activity could deviate from the previous and more examined buyout wave during 1980s to mid-1990s. For instance target firms are nowadays not only turnaround or

[11] Source: Statistics from European Private Equity and Venture Capital Association (EVCA).

inefficient firms since more efficient firms with high cash flows are also targeted (Jensen et al., 2006). As a remark it is found theoretically that PE fund ownership is especially beneficial in turnaround firms (Cuny and Talmor, 2006). Moreover, the capital structures of the buyouts are less fragile today (Guo et al., 2007) which according to the "Jensen hypothesis" indicates fewer disciplining benefits of debt.
The second contribution is that evidence is provided on a continental European country – in particular Denmark. Hence, Denmark is interesting since it resembles some stylized facts of the corporate structures in continental Europe and thereby may differ from USA and U.K. As mentioned the vast majority of the existing studies focus on USA and U.K. and evidence from e.g. continental European countries is missing. It is also relevant since the ownership structure of continental European countries deviates substantially from USA and U.K., e.g. there are more closely-held companies with large shareholders (e.g. Faccio and Lang, 2002). Generalized, this should diminish the expected benefits from PE fund ownership since companies have ex ante fewer theoretically agency problems.
Thirdly, a selection bias is probably avoided in this study since it is possible to exploit a comprehensive population of Danish PE fund buyouts due to the data quality. Most related studies use a limited population depending on availability of data (e.g. Cressy et al., 2007; Guo et al., 2007). Moreover, this sample consist of both public-to-private and private-to-private transactions, however, the great majority of earlier studies focuses on public-to-private transactions mainly due to data limitations. However, if the total PE buyout industry is to be evaluated private-to-private transactions should also be taken into account. Especially since private-to-private transactions accounted for the vast majority of buyout transactions the last decade. Remember that the "Jensen hypothesis" in principle indicates that private-to-private transactions are associated with fewer agency cost savings. This suggests that at least in the continental European case we might expect and experience fewer gains from alignment of ownership and control.

The present paper addresses the issues of how PE fund ownership affects post-buyout firm performance (portfolio firm) and whether the claimed superior governance model is able to explain the empirical findings. The superiority of PE fund ownership is examined by testing the ownership, the debt and the stakeholder expropriation

hypotheses respectively (e.g. Grossman and Hart, 1980; Jensen, 1986a, 1986b, 1989; Shleifer and Summers, 1988; Aghion and Bolton, 1992; Renneboog and Simons, 2005; Cumming et al., 2007). Particularly, it is done by assessing whether changes in ownership structure, changes in debt structure affects firm performance, and whether different expropriation channels are affected.

The analysis is performed on a dataset of 73 buyouts which took place in Denmark[12] during 1991-2004. The 73 buyouts are matched, on the basis of ownership change, industry and size, with 545 firms serving as controls. Surprisingly, the main finding is that post-buyout performance of portfolio firms falls.[13] This is a different result compared with most of the evidence in the literature. In addition, it is found: 1) that portfolio firm performance was improved through better monitoring of management possibly resulting from less separation of ownership and control (the ownership effect). Moreover, the data show that post-buyout (majority) ownership concentration on average falls which then could explain the lower performance; 2) Furthermore, little evidence is found that monitoring by total debt improves portfolio firm performance relatively to control firms (the debt effect). It does seem, however, as if debt with shorter maturity has a positive monitoring effect; 3) portfolio firm's pays out higher dividends compared to the benchmark firms. This result suggests that owners behave in an opportunistic manner which supposedly could be costly for stakeholders and the portfolio firm in the long term (the expropriation effect). However, there is not found evidence of layoffs in the data. Overall, the expected effects of the superior governance model of PE funds do not seem to appear in the data.

[12] Even though Denmark is a small economy it has accounted for some of the biggest European deals (ISS and TDC – the TDC acquisition was at its time the largest deal ever in Europe) within the last couple of years.

[13] A Danish governmental report (ØEM, 2006) also analysed the Danish PE market. Generally few significant results are found. Compared to a group of reference firms during 1995-2005 they found that portfolio firms have significantly higher growth in employment, higher dividend ratio, and also a higher debt ratio. Yet the effect on TFP, labour productivity, and profits is positive but not significant. While comparing the economic situation of firms before and after the buyout they have significantly higher growth rates of employment and sales. But the portfolio firms tend to have insignificantly lower post-buyout profitability. To some extend these results differ from the findings of this analysis. There are different explanations for this - for instance ØEM main focus is on employment and sales, however as discussed later these measures are subject to limitations in this dataset. Secondly, ØEM apply a less precise control group since they define a reference firm as the 'median firm' with 120 employees. Another caveat is that ØEM drop extreme observations while I truncate them. One problem with dropping these extreme observations is that especially portfolio firms could be exposed to either a post-buyout expansion or downsizing strategy, this is thus neglected by report of ØEM. Again this will bias the results. Other explanations could be a different period of analysis, and use of slightly different data sources.

The main finding could result from other sources. For instance *selection bias* could contribute to my result. However, portfolio firms are not different based on observable characteristics at the entry time, i.e. the *selection bias* argument is rejected. This also indicates that PE funds screening ability or strategy is surprisingly modest – it does not seem that they are able to 'pick the winners'. Examinations of alternative performance measures did not support the governance model either, i.e. the *valuation bias* is rejected. Finally, the so-called J-curve predictions were investigated.[14] In these predictions it is supposed that for instance strategic changes in portfolio firms cause under-performance for up to the 4th year after the buyout, and afterward portfolio firms will out-perform. This prediction is examined and little support is found for the out-performance in the late years of ownership, meaning that such *measurement errors* do not seem to be important in this data.

The analysis is carried out in four steps: 1) An adequate and unique data set with both pre-buyout and post-buyout accounting information on 73 portfolio firms and 545 matched control firms is obtained. The data cover Danish firms within the period 1991-2004; 2) empirically the post-buyout performance effect of PE fund ownership is examined; 3) the governance model is evaluated: three theoretical hypotheses - ownership, debt and stakeholder expropriation are empirically tested; 4) Alternative explanations are introduced since endogeneity problems could interfere with our findings. Since it is difficult to find valid instruments three possible alternative explanations of our result are discussed: selection bias, valuation bias and measurement errors.

The paper proceeds as follows. In the next section the data are described. In section 3 the empirical strategy is introduced and the theoretical hypotheses are explained. Section 4 presents and discusses the empirical findings and the results of hypotheses testing together with discussing alternative explanations. Finally, I conclude and discuss.

[14] It is commonly argued in the venture capital literature that the J-curve pattern is present, but it is also applicable to the buyout industry. The idea is that the evolution of venture capital returns (or firm profitability) over time is shaped as a J-curve (e.g. Burgel, 2000).

2. Data

2.1. Sample selection

The data cover firm level financial information from *Købmandsstandens Oplysningsbureau* (KOB) on all limited liability Danish firms. KOB data is assembled by a private firm using annual reports that all limited liability firms are required to file at the Danish Ministry of Economic and Business Affairs. Firstly, data is unique since it consists of data on all privately-held firms which is not standard for most countries. For instance accounting data is generally not available for US private companies (see Cressy et al., 2007). Secondly, all financial statements are structured identically by KOB.

The dataset primarily contains selected accounting information of limited liability firms in Denmark – such as sales, profits, assets etc. and these are book values. Danish regulations only mandate disclosure of firms' assets and measures of firm profitability, such as operating or net income. Moreover, the disclosure of alternative firm-level attributes, such as sales or employment, is not required, although some firms do selectively report them. Therefore constructed variables using sales and/or employees will not have my main focus since they could introduce biases. I also have industry information at the DB93 classification level and these correspond to the NACE-codes.[15] The KOB data also contains some ownership and management data, but does not include acquisition prices. The ownership data contains information of shareholder names and their respectively ownership stakes, however, documentation of ownership stakes is scarce (few report this). Moreover, it is not possible to state whether different shareholders are affiliated (e.g. in the same family).

The data enable me to define a set of relevant variables for our analysis such as for instance primary result to total assets, return on capital employed, sales growth, (total)

[15] European Industry Classification Codes.

debt etc.[16] The data is corrected for extreme observations by truncating (e.g. if return on assets is below -100% it is registered as -100%).

From this data source a dataset of 618 firms in the period 1991-2004 is constructed; where 73[17] of them are portfolio firms and the remaining 545 firms are control group firms. Importantly, data selected on portfolio firms cover parent company information and not holding company information. This study investigates the impact of PE fund ownership on the (parent) company level. The main reason for this is that the parent company is the lasting entity after an exit whereas holding companies are closed down. Moreover, there is no pre-buyout data at the holding company level since these are first established at the buyout time. Remark that this buyout sample cover both private-to-private and public-to-private transactions. The portfolio firm sample size is as complete as it can be using the KOB data[18] and it also employs pre-buyout data. In total there are 3071 firm-year observations which are almost on average 5 years of data for each firm. More specific, the sample contains 326 firm-year observations of PE fund ownership, i.e. on average 4 years of data per portfolio firm (post-buyout). The data set is unbalanced, meaning that it is not a criterion to have data for each firm for the entire period 1991-2004. Doing this a potential underlying survivorship bias in the data is avoided.

Since the owner identity or relationship information is not available in this data it is pursued collected externally. It was possible to gather external information on 54 of the 73 buyouts. The pre-buyout owners showed to be industrial, financial institutions, families, management or publicly listed (15 family buyouts and 11 public-to-private transactions were found). Furthermore, more detailed ownership data on 42 buyouts were also found.[19]

[16] Debt is the sum of long-term (*langfristet gæld*) and short-term debt (*kortfristet gæld*). KOB does not provide information on whether companies issue corporate bonds. Return on capital employed is defined as primary result relatively to equity and debt.
[17] In other studies the sample ranges between approximately 40-160 buyout firms.
[18] Here the focus is on both private and public PE fund buyouts whereas earlier studies (e.g. Kaplan, 1989a; Smith, 1990) investigated effects of MBOs among publicly traded firms. Their procedure could introduce a survivorship bias in the findings since listed firms on average could be better performing on average.
[19] Additional information is obtained from webpages of PE funds and portfolio firms, newspaper articles and Polaris Private Equity helped as well.

The information on Danish (PE fund) buyout deals is based on three different sources; i) webpages of the PE funds, ii) the governmental report on the Danish PE industry by the Danish Ministry of Economic and Business Affairs (ØEM, 2006), iii) Newspaper articles. A portfolio firm is defined as a firm which has been owned by a (locally or globally placed) PE fund during 1991-2004. Meaning that if a firm has been through a secondary (or more) buyout(s) it still only counts as one portfolio firm. Following this approach 73 portfolio firms with valid accounting data are found.[20]

The KOB dataset further enables me to establish an accurate benchmark sample of identical firms. Each portfolio firm is matched with identical firms using the following matching methodology: A control firm must i) have experienced a change in ownership – by definition there must have been a 5 percent change in the ownership structure during 1991-2004; ii) be in the same industry (using the NACE classifications) and similar in size (total assets). Each portfolio firm is thus matched with up to the 5 nearest[21] firms, measured on assets in each year (before and after the buyout). This approach yields a control group sample of 545 firms. Studies as for instance Alemany and Martì (2005) and Cressy et al. (2007) use a somewhat similar matching methodology.[22]

Notice that it varies over time which firms are incorporated as controls depending on whether a firm continues to exist, availability of information or changes in the industry positioning of firms. I would argue that it is an advantage of this methodology that portfolio firms are compared with as identical firms as possible in each year (before and after the buyout). For example a control firm could be comparable to a specific portfolio firm in the buyout year but it might not be comparable 3 years later – this

[20] ØEM (2006) concludes that approximately 120 firms have been through a PE fund buyout since 1995. The explanation for their larger sample is firstly that 2005 and 2006 are included and a large number of deals have taken place within the last two years. Secondly, they count the number of deals whereas in this study the number of firms is accounted, hence their number is per definition higher.

[21] 'Nearest' is defined as the squared difference between absolute total assets of the portfolio firm and control firm in each year. The 5 nearest firms, if that many exists, are incorporated. Since the squared difference may change over time the control firms may also change over the period.

[22] Another method of matching is the propensity score (Rosenbaum and Rubin, 1983). This approach employs a predicted probability of group membership – in our case portfolio firms vs. control group – based on observed characteristics. The propensity score is seen as an improved version of simple matching (similar to what is used in this study), however, it has many of the same limitations. For example hidden biases remains since it only, as in the simple version, controls for observed variables (Shadish, Cook and Campbell, 2002).

matching procedure adjusts for this. Hence this approach adjusts for both changes in portfolio firms and control firms over time.

The argument for the first criterion is that the ownership change decision may be endogenous. Acknowledging the target firm (historically) characteristics of the previous buyout wave inefficient firms are probably more exposed to changes in ownership. Therefore if this criterion is neglected a bias may occur since two samples which ex ante have a different situation are potentially compared. Since exact information on ownership stakes is restricted the most elaborate measure that can be employed for the purpose of matching is whether there has been an ownership change of 5 percent or more (which is reported). Ideally only firms with a majority change in ownership should be included, however since ownership information is not exact this is not possible. Indeed, as previously mentioned, it would be desirable if precise ownership identity information (e.g. family ownership, financial institutions etc.) was available. However, this is not an option in this setting. It may bias the results when comparing the portfolio firm sample to the control group (with different owners) because different owner identities are compared, but how it would bias the results is not clear.

The reasoning behind the size and industry criteria is that it is desirable to identify as comparable firms as possible and thereby the explanatory power should increase together with avoiding selection bias. As discussed later (see table 2) following this methodology control firms are on average smaller firms which indicates that portfolio firms are large in their industries. However, one problem here with obtaining equally sized control firms are that observations would have to be excluded (portfolio firms).[23]

Compared to earlier studies (e.g. Ravenscraft and Scherer, 1987; Kaplan, 1989a; Smith, 1990; Desbrières and Schatt, 2002) I believe that the benchmark used in this study is more exact. Firstly, since the data cover the total population of Danish firms. Secondly, the sample size of the matched control companies is fairly large and comprehensive compared to other studies that have used similar approaches (e.g. Alemany and Marti,

[23] As an illustrative example it would be impossible to find an equally sized (Danish) firm that could serve as control for the large Danish telecommunications company TDC. Hence, if it was a strict criterion that they should be equally sized TDC should then be dropped.

2005; Cressy et al., 2007). This present procedure also controls for ownership changes and time variation within the control group. Further, the ownership change matching criteria make the benchmark more comparable to the portfolio firms. Finally, due to the unique data I have the ability of defining different matched samples of control firms. Later in the analysis robustness checks are performed via changing the matching methodology with respect to neglecting the ownership change criteria, only using the 2 nearest companies in each year as controls, and changing the procedure so that control firms are first matched by size and industry and then by ownership changes.

2.2. Descriptive statistics

2.2.1. Pre-buyout Firm Characteristics

In table 1 portfolio firms and benchmark firms are compared before the time of the ownership change. The table presents summary statistics of firms on size, growth, performance, capital structure and other measures. Since considerable changes are usually implemented within the year of ownership change the preceding year and the preceding four-year average (including the year of entry) are analysed. When the exact time of the ownership change is used it is only possible to compare the portfolio firms with 325 control firms in which the ownership change takes place in the years were they serve as controls (following the matching procedure). Further, note that some observations are missing in table 1. This is most likely due to changes in accounting standards or period around the ownership change.

Table 1 provides evidence of whether portfolio firms ex ante are different from other firms that also undergo an ownership change. It is crucial for the interpretation of the regression analysis described in section 3 whether PE funds tend to select turnaround firms (e.g. firms under financial distress) or so-called cash cows (i.e. well-performing firms with high profit margins and a high cash flow). In principle, table 1 should reveal the screening ability or strategy of the PE funds for the given measures.

Table 1
Pre-Buyout Firm Characteristics

The 'year before the entry' is the year before the buyout or ownership change. Hence, changes within the first year of the new ownership is removed. The 'Pre'-situation accounts for all observations before the ownership change. Control group firms are matched on size and industry from a sample of firms that has been through an ownership change within the period. Each portfolio firm is matched with up to the 5 nearest firms within each year, measured on absolute asset size. According to the matching procedure it is not a criteria for the control firms that the exact year of ownership change is included. It enables me to use 325 control firms in this table, however the lower number of observations is explained by missing information in some years and changed industry positioning. The pre-values are given as 4 year averages (including the year of ownership change). The growth measures used for 'year befor entry' are 3 year averages (ex ante), including year of entry.
Return on capital employed is defined as the ratio between primary result and the sum of equity and debt. Debt is defined as the sum of short term debt and longterm debt. Standard deviations and number of observations are reported in brackets for the descriptive statistics. Further the standard errors for the difference tests are also reported in brackets. The ***, **, * respectively denotes whether the difference in the means between the portfolio firms and control group firms is significantly different from zero at a 1, 5, or 10-percentage level. Source: KOB and own calculations.

	Pre		***Year before entry***		***Difference between portfolio firms and benchmark firms:***	
	Portfolio firms	*Benchmark firms*	*Portfolio firms*	*Benchmark firms*	*Pre*	*Year before entry*
A. Size						
Ln(Net sales)	13.544	12.790	13.389	12.246	0.754 **	1.143 ***
	[1.489]	[1.770]	[1.462]	[2.339]	(0.314)	(0.292)
	[47]	[59]	[58]	[119]		
Ln(Total assets)	12.940	11.419	12.924	11.245	1.521 ***	1.679 ***
	[1.741]	[2.124]	[1.656]	[2.258]	(0.315)	(0.265)
	[55]	[100]	[62]	[196]		
Ln(Employees)	6.244	4.912	6.090	4.572	1.332 ***	1.518 ***
	[1.766]	[1.929]	[1.775]	[2.020]	(0.318)	(0.277)
	[52]	[88]	[61]	[171]		
B. Growth						
Sales growth	0.104	0.088	0.113	0.102	0.016	0.011
	[0.142]	[0.131]	[0.129]	[0.151]	(0.030)	(0.032)
	[42]	[56]	[42]	[56]		
Asset growth	0.158	0.088	0.170	0.083	0.070	0.087 *
	[0.275]	[0.132]	[0.293]	[0.150]	(0.042)	(0.047)
	[50]	[95]	[50]	[95]		
Employee growth	0.115	0.049	0.118	0.056	0.066 *	0.062
	[0.219]	[0.104]	[0.238]	[0.129]	(0.035)	(0.037)
	[47]	[81]	[47]	[82]		
C. Performance						
Gross profit to total assets (GROA)	0.603	0.623	0.605	0.546	-0.020	0.059
	[0.305]	[0.317]	[0.348]	[0.383]	(0.055)	(0.054)
	[50]	[86]	[59]	[172]		
Primary result to total assets (OROA)	0.109	0.098	0.100	0.063	0.011	0.037
	[0.129]	[0.162]	[0.224]	[0.253]	(0.024)	(0.034)
	[54]	[98]	[61]	[191]		
Netincome to total assets (ROA)	0.066	0.050	0.042	0.023	0.016	0.019
	[0.111]	[0.131]	[0.209]	[0.202]	(0.020)	(0.031)
	[55]	[100]	[62]	[196]		
Return on capital employed (ROCE)	0.100	0.093	0.107	0.074	0.007	0.033
	[0.076]	[0.145]	[0.099]	[0.197]	(0.020)	(0.021)
	[41]	[78]	[49]	[151]		
Net sales to total assets (Asset turnover)	0.948	0.965	0.945	0.892	-0.017	0.053 *
	[0.117]	[0.069]	[0.168]	[0.236]	(0.019)	(0.031)
	[47]	[59]	[58]	[120]		
D. Capital structure						
Equity to total assets	0.354	0.354	0.362	0.352	0.000	0.010
	[0.144]	[0.183]	[0.180]	[0.235]	(0.027)	(0.029)
	[55]	[100]	[62]	[196]		
Debt to total assets	0.584	0.607	0.581	0.612	-0.023	-0.031
	[0.142]	[0.178]	[0.183]	[0.231]	(0.026)	(0.029)
	[55]	[100]	[62]	[195]		
Short-term debt to total assets	0.458	0.435	0.452	0.462	0.023	-0.010
	[0.158]	[0.182]	[0.194]	[0.236]	(0.028)	(0.030)
	[55]	[100]	[62]	[195]		
Long-term debt to total assets	0.159	0.208	0.163	0.201	-0.049 **	-0.038
	[0.110]	[0.143]	[0.142]	[0.189]	(0.023)	(0.026)
	[41]	[80]	[49]	[153]		
Debt to equity	2.264	2.840	2.628	2.940	-0.576	-0.312
	[1.843]	[2.103]	[2.715]	[2.855]	(0.372)	(0.459)
	[41]	[80]	[49]	[153]		
E. Other measures						
Dividends to net income	0.517	0.419	0.480	0.489	0.098	-0.009
	[0.256]	[0.260]	[0.401]	[0.393]	(0.071)	(0.075)
	[23]	[30]	[40]	[99]		
Firm age (years)			43	28		15 **
			[57]	[30]		(7.794)
			[62]	[195]		

Firstly, table 1 shows that portfolio firms are significantly larger (measured on log of net sales, log of total assets, and log employees) compared to the benchmark firms both measured on the four-year average and one-year before the ownership change. It is remarkable that portfolio firms are significantly larger taking the matching procedure into consideration. This suggests that PE funds acquire firms that are industry leaders, i.e. large firms. Since portfolio firms are in the top end of the industries (measured on size) the matching approach could be criticized for this. However, if the main goal is to match portfolio firms with equally sized control firms one might potentially end up by excluding (portfolio) firms in our sample.

Growth measures of sales, total assets, and employees propose that portfolio firms in general seem to have higher growth rates although for most of the measures the differences are not significant. Note, that firms are not obliged to report sales or number of employees so these specific growth measures could be subjected to selection bias as explained earlier. This is somewhat surprising because as just noted these firms are already larger and maybe therefore not as exposed to high growth rates.

Thirdly, there are few significant differences when diverse performance measures (gross profit to assets, *GROA*; primary result to assets, *OROA*; net income to assets, *ROA*; return on capital employed, *ROCE*; and net sales to total assets; *asset turnover*) are compared. Although performance is higher for portfolio firms for the above measures the only significant result is for *asset turnover*[24] which is only significant at the 10-percentage level.

Examining various measures of firm capital structure portfolio firms are on average less leveraged (debt to assets, short- and long-term debt to assets[25], and debt to equity) – however only the long-term debt ratio is significantly lower measured on the four-average before the entry of the PE funds. The average dividend payout ratio was not significantly different between the groups around the ownership change. Lastly,

[24] Asset turnover can be interpreted as a proxy for managerial efficiency.
[25] Note that Danish banks formally give short term loans but these are in practice long term loans. Data is however not detailed in these matters. Therefore it is not possible to investigate the underlying conditions behind the debt contracts.

portfolio firms are on average 15 years older than the benchmark firms at the time of entry.

The main finding of table 1 is that portfolio firms do not seem to be much different measured on profit margins, growth path and capital structure compared to the control firms which are matched on size and industry together with being subjected to an ownership change. This is different compared to a study (Desbrières and Schatt, 2002) on French firms involved in MBOs since the financial situation of these target firms is better than other firms in the same industry. Since data show that portfolio firms are significantly larger and older these findings suggest that PE funds acquire mature firms. Table 1 also indicate that the screening ability of PE funds is modest since they are not able to find targets that are very different from those of their competitors on the market. One explanation could be that the takeover market for privately-held firms is not sufficiently transparent and that firms (or initial owners) have the advantage of deciding when or if they should enter the process of selling. Especially, it might be the case for Denmark where many of the privately-held firms are family owned, and it is presumable not easy to persuade a family to sell their business. It also happens that it is the target firms themselves that approaches the PE funds in the pre-buyout process and not the other way around. Furthermore, it might be difficult for the PE funds to gather information and/or seek out potential buyout candidates. This might explain why PE funds in the recent years have focused a lot on public-to-private deals.

2.2.2. Post-buyout Firm Characteristics

Table 2 reports summary statistics of portfolio firms and the control group. The differences are tested between; i) PE fund ownership and non-PE fund ownership, ii) the post-buyout and pre-buyout situation of portfolio firms.

Portfolio firms (PE fund owned firms) are larger (remember the pre-buyout characteristics) than non-PE fund owned firms. This suggests as also mentioned earlier that portfolio firms seem to be industry leaders. This difference may be caused by the matching methodology, however, it might be difficult to obtain perfectly matched samples with respect to firm size without excluding data. In section 4.3.1 I experiment

with different control groups and the difference (larger portfolio firms) remains robust. Table 2 also show that portfolio firms are on average not downsized, i.e. it does not seem like PE buyout funds overall divest subsidiaries of the acquired businesses. Actually, the portfolio firm's keeps growing, however, not at the same pace as control firms but these are also smaller.

When only investigating portfolio firm performance all five measures fall (significant at the 1 percentage level) after the PE fund transaction between 4 and 19 percentage points - though performance is still positive. Moreover, the figures show that portfolio firm performance is also lower ex post compared with non-PE fund ownership yet only significant for *GROA*, *OROA* and *ROA*.[26] This preliminary result indicates that portfolio firms underperform and the result is supported by the related findings of Ravenscraft and Scherer (1987) and Desbrières and Schatt (2002) but is in contrast with other related studies such as Kaplan (1989a), Smith (1990) and Cressy et al. (2007).

The capital structure within the portfolio firm changes as would be expected. Firstly, firm equity for portfolio firms falls significantly post-buyout and is also lower than that of the benchmark. Moreover, portfolio firm leverage (debt to assets, debt to equity, short-term and long-term debt) increases significantly by 4-9 percentage points after the buyout and the debt to equity ratio increases significantly by approximately 25 percent. This result also holds for the debt-to-assets ratio when portfolio firms and non-PE fund owned firms are compared (increases by 4 percentage points). The increasing debt together with lower equity stakes (inversely related) is not very surprising since it demonstrates common features of buyouts (e.g. LBOs). These results are in line with other studies mentioned earlier (Muscarella and Vetsuypens, 1990; Palepu, 1990; Andrade and Kaplan, 1998). In fact, one might have expected a more pronounced change in debt structure, but the modest effect might be due to the fact that only parent companies are considered in this analysis while most of the debt financing of the deal takes place at the holding company level.

[26] If the differences in operating performance before and after the ownership change are examined between portfolio firms and control firms (using data as in table 1), it is also found that the performance of portfolio firms significantly drops post-buyout relatively to the pre-buyout situation and the control group (results not shown).

Table 2

Firm Characteristics - PE fund owned vs. non-PE fund owned

Control group firms are matched on size and industry from a sample of firms that has been through an ownership transition within the period. 73 portfolio firms and 545 controls firms are employed. Each portfolio firm is matched with up to the 5 nearest firms within each year, measured on absolute asset size. The 'PE fund owned' is the average of all observations while owned by a PE fund. 'Non-PE fund owned' corresponds to the average of all observations serving as controls. 'Pre-buyout' documents the average of the observations of portfolio firms when they were not owned by a PE fund.

The growth measures are defined as 1 year changes. Return on capital employed is defined as the ratio between primary result and the sum of equity and debt. Debt is defined as the sum of short term debt and longterm debt. Standard deviations and number of observations are reported in brackets for the descriptive statistics. Further the standard errors for the difference tests are also reported in brackets. The ***, ** and * denotes respectively whether the difference in the means between the portfolio firms and control group firms is significantly different from zero at a 1, 5 or 10-percentage level. Source: KOB and own calculations.

				Difference between:	
	PE fund owned (Post-buyout)	*Non-PE fund owned*	*Pre-buyout Portfolio firms*	*PE fund vs. Non-PE fund owned*	*Post-buyout vs. Pre-buyout (Portfolio firms)*
A. Size					
Ln(Net sales)	13.192	12.262	12.962	0.930 ***	0.230 **
	[1.214]	[2.065]	[2.079]	(0.086)	(0.118)
	[300]	[1733]	[470]		
Ln(Total assets)	12.794	11.347	12.406	1.447 ***	0.388 ***
	[1.402]	[2.044]	[2.142]	(0.087)	(0.121)
	[326]	[2745]	[547]		
Ln(Employees)	5.929	4.647	6.001	1.282 ***	-0.072 **
	[1.376]	[1.952]	[1.923]	(0.088)	(0.117)
	[308]	[2453]	[504]		
B. Growth					
Sales growth	0.082	0.120	0.137	-0.038 *	-0.055 ***
	[0.294]	[0.371]	[0.328]	(0.020)	(0.025)
	[272]	[1495]	[390]		
Asset growth	0.077	0.158	0.180	-0.081 ***	-0.103 ***
	[0.366]	[0.426]	[0.392]	(0.023)	(0.029)
	[298]	[2439]	[472]		
Employee growth	0.040	0.093	0.150	-0.053 **	-0.110 ***
	[0.335]	[0.353]	[0.404]	(0.021)	(0.029)
	[280]	[2136]	[426]		
C. Performance					
Gross profit to total assets (GROA)	0.470	0.568	0.657	-0.098 ***	-0.187 ***
	[0.318]	[0.393]	[0.396]	(0.020)	(0.026)
	[315]	[2435]	[473]		
Primary result to total assets (OROA)	0.050	0.070	0.105	-0.020 *	-0.055 ***
	[0.177]	[0.203]	[0.131]	(0.011)	(0.012)
	[326]	[2695]	[525]		
Netincome to total assets (ROA)	0.010	0.037	0.064	-0.027 ***	-0.054 ***
	[0.180]	[0.164]	[0.120]	(0.010)	(0.011)
	[326]	[2745]	[547]		
Return on capital employed (ROCE)	0.059	0.077	0.109	-0.018	-0.050 ***
	[0.280]	[0.199]	[0.087]	(0.017)	(0.018)
	[289]	[1997]	[424]		
Net sales to total assets (Asset turnover)	0.893	0.886	0.936	0.007	-0.043 ***
	[0.216]	[0.246]	[0.180]	(0.014)	(0.016)
	[300]	[1743]	[472]		
D. Capital structure					
Equity to total assets	0.290	0.352	0.393	-0.062 ***	-0.103 ***
	[0.192]	[0.227]	[0.208]	(0.011)	(0.014)
	[326]	[2745]	[547]		
Debt to total assets	0.644	0.609	0.552	0.035 ***	0.092 ***
	[0.192]	[0.229]	[0.210]	(0.012)	(0.015)
	[326]	[2740]	[547]		
Short-term debt to total assets	0.461	0.466	0.415	-0.005	0.046 ***
	[0.212]	[0.240]	[0.192]	(0.013)	(0.015)
	[326]	[2740]	[547]		
Long-term debt to total assets	0.217	0.202	0.175	0.015	0.042 ***
	[0.172]	[0.180]	[0.128]	(0.011)	(0.012)
	[289]	[2014]	[430]		
Debt to equity	3.013	2.791	2.446	0.222	0.567 ***
	[2.580]	[2.652]	[0.230]	(0.163)	(0.191)
	[289]	[2014]	[430]		
E. Other measures					
Dividends to net income	0.488	0.428	0.409	0.060 *	0.079 **
	[0.431]	[0.393]	[0.350]	(0.036)	(0.042)
	[161]	[1237]	[255]		
Firm age (years)	36	30		6 **	
	44	34		(2.520)	
	[325]	[2731]			

The dividend payout ratio is significantly higher for the portfolio firms compared to the non-PE fund ownership group. In addition, if dividends are compared at the portfolio firm level the post-buyout payout ratio increases significantly about 8 percentage points. Finally, as in table 1 it is documented that portfolio firms are older than firms without PE fund ownership.

3. Empirical Strategy

3.1. Empirical specifications

OLS regression methods are applied when examining the average post-buyout impact of PE fund ownership while taking the pre-buyout situation into account and a comparison relative to a control group of firms is also implemented. The general specification is then:

$$y_{it} = \alpha + \beta_1 PEF_{it} + \beta_2 Size_{it} + \beta_3 Age_{it} + \beta_4 Industry_i + e_{it}$$

In this analysis the dependent variable ($y_{i,t}$) is the measure of; growth (assets), operating performance (*GROA, OROA, ROA*), other performance measures (*asset turnover, ROCE*), capital structure (debt to assets) and the dividend payout ratio. I prefer to use operating performance measures relative to total assets mainly since the other suited base variable (sales) might be encumbered with a bias. Related studies also use similar performance measures (Ravenscraft and Scherer, 1987; Kaplan, 1989a; Smith, 1990; Cressy et al., 2007). It is critical to use net sales since it could introduce a bias in the analysis because reporting net sales is optional for many Danish firms. Using total assets also might introduce a bias since firm goodwill valuations often changes dramatically post-buyout. Hence this will lead to larger total assets which all else equal infer a downward pressure on our operating performance ratios and therefore the impact from PE fund ownership will be underestimated. However, since most of this potential asset boosting through changed goodwill depreciations takes place at the holding company level it is not judged problematic in the present analysis which deals with parent companies. Further, operating performance measures relative to total assets

may also be problematic if the portfolio firms undertake many acquisitions, because goodwill valuation thereby also changes. Yet, an active acquisition policy is clearly not limited to portfolio firms in the present comparative analysis.

The key explanatory variable ($PEF_{i,t}$) is a time-varying dummy variable that denote whether the firm is owned by a PE fund or not. It equals one if firm *i* is owned by a PE fund in year *t* and zero otherwise. Matched control firms are included as zeros.

Furthermore, a set of control variables (*Controls*) are introduced which are commonly used in the literature – these are firm size (log of assets), firm age (log of the difference between 2004 and the year of establishment) and industry dummies (based on the NACE classifications). Firm size ($Size_{i,t}$) controls for any potential size effects (economies of scale) in the data. As seen in the summary statistics portfolio firms are on average larger than an average benchmark firm so when I control for firm size in the regression it is to make sure that the impact on the dependent variable cannot be explained by portfolio firms being larger. Moreover, I control for firm age ($Age_{i,t}$) to avoid survivorship bias in the data because older firms are prone to be better performing because they have survived longer. Portfolio firms are on average older than a benchmark firm and this necessitates the inclusion of firm age as a control. Finally, industry dummies[27] ($Industry_i$) are applied to correct for any potential industry variations in the data. In principle this is already done indirectly through the construction of the control sample.

Then two types of models are regressed – one kind as explained above and another where fixed effects models are estimated, i.e. industry dummies are excluded. Fixed effects models are estimated since there might be firm-specific differences that are independent across time but could be correlated with the rest of the explanatory variables.

The difference-in-difference methodology has been applied in similar studies (e.g. Kaplan, 1989a; Smith, 1990; Desbrières and Schatt, 2002; Guo et al., 2007). According

[27] A 22 industry grouping is applied.

to this setup the dependent variable is defined as the difference between ex post performance and ex ante performance. Crucial to this approach is therefore the choice of event window. Usually, studies have used an event window between +/-4 years. Even though this methodology is practicable it is subject to important limitations; firstly, one caveat especially in these studies is the relatively low number of buyouts – and by using the difference-in-difference methodology one ends up with only one observation per firm. One can argue that as many observations for each firm as possible should be used – in this study all the years with PE fund ownership are used (see specification above).

Another problem is to determine the optimal choice of event window. Availability of data could force limitations on the choice of event window.[28] While the investment horizon of PE funds is usually 3-10 years it could be problematic to focus only on year two or three etc. This argument is also the basis of the J-curve effect, which claims that firm performance will first be improved after the 4th or 5th year of ownership. This further implies that the choice of event window is crucial for the results. Note, that if the J-curve predictions are present it should make it more difficult to obtain a result of improved performance (on average) in these analyses.

As robustness check the difference-in-difference methodology is also applied here using windows of -1/+3 and -3/+3 years.

Finally, endogeneity problems in the analysis will be addressed and discussed later since there might be some underlying effects (observed or unobserved) that could bias our result and lead to misleading conclusions.

3.2. Hypotheses

It is argued that benefits of PE fund ownership rises from financial and governance engineering at the firm level, i.e. it captures value destroyed by agency problems. The main idea is that this (new) owner is better at disciplining, controlling and provides better incentives for the firm management. Hence, theoretically the superiority of PE fund ownership has mainly been deduced from the agency theory: the incentive re-

[28] For instance Kaplan (1989a) and Smith (1990) only have data from the year before the event and onwards.

alignment hypothesis, the control hypothesis and the free cash flow hypothesis. Nevertheless, it has also been claimed that PE fund ownership destruct value from a redistribution of wealth from stakeholders to shareholders, i.e. expropriation. In the following three different hypotheses are discussed.

3.2.1 The Ownership hypothesis

The ownership hypothesis here mainly covers the incentive re-alignment hypothesis and the control hypothesis (e.g. Coase, 1937; Fama and Jensen, 1983; Grossman and Hart, 1980; Jensen and Meckling, 1976; Jensen, 1986a, Jensen, 1989) which both deals with agency costs driven by the potential separation of ownership and control within a firm.

Related to the incentive re-alignment theory a divergence (conflict) in interests between the management and the shareholders may destroy firm value as stated by Berle and Means (1932). The main problem is that private benefits can be extracted by managers due to poor monitoring activities when ownership and control is separated (e.g. Jensen and Meckling, 1976; Jensen, 1986a, 1989).

The control hypothesis also relates to the separation of ownership and control. Grossman and Hart (1980) describe how the free-rider problem of monitoring the management in firms with dispersed ownership. The rationale is that shareholders with small equity stakes may underinvest in monitoring activities.[29] Therefore especially public-to-private transactions experience improvements resulting from mitigation of problems raised by the incentive re-alignment and control hypothesis.

Another problem in corporations is contractual incompleteness (Aghion and Bolton, 1992). In this framework long-term financial contracts between entrepreneurs and investors are incomplete without reallocating the control rights. The optimal solution is

[29] An argument opposing the positive agency cost theories of PE fund ownership is the over-monitoring theory. This theory introduces a negative impact from concentrated ownership (Aghion and Tirole, 1997; Burkart, Gromb, and Panunzi, 1997). The intuition is that large shareholders are aware of the potential agency costs associated with the separation of ownership and control. Yet, with the goal of eliminating these agency costs owners may end up over-monitoring the management. This will dampen managerial initiatives, e.g. poorer firm innovation could lead to lower firm growth and worse long-horizon firm efficiency. It is difficult to test the over-monitoring hypothesis directly.

to give all the control rights to the owner(s). This problem may especially occur in firms with dispersed ownership. Again this indicates that PE buyout funds are beneficial since they improve the incentive and control schemes within a firm.

Since PE funds acquire majority ownership stakes (often 100 percent) benefits from re-aligning the incentives, improved controlling mechanisms and/or a better contractual framework of control rights is expected to improve firm efficiency. Especially, these forms of wealth gains are evident in public-to-private deals. Hence the theories on incentive re-alignments, control and contractual completeness lead to what I denote the ownership hypothesis:

Hypothesis 1: *Portfolio firms will experience larger wealth gains when ownership and control is reunified, i.e. the ownership concentration has increased post-buyout.*

This hypothesis clearly fits well for the public-to-private transactions due to the change in degree of ownership concentration. However, most of the PE fund deals are among already privately-held firms. Since these firms presumable ex ante have a concentrated ownership structure the wealth gains from this hypothesis may be non-existent. Furthermore, PE funds often acquire firms where the initial owner (e.g. a family) keeps an ownership stake or part of the firm is ex post owned by other co-owners such as pension funds, club-deals etc. Under these circumstances an reverse effect may occur, i.e. the ownership concentration is lower after the PE fund buyout meaning that the post-majority owner has a smaller fraction of the ownership compared to the pre-majority owner.

Using ownership information this hypothesis can be tested. Since the ownership data from KOB is scarce information on the exact ownership structure of the portfolio companies around the transaction is self-collected. More detailed ownership data on 42 of 73 firms are found. The data cover ownership concentration information of the initial owner(s) and how much of the firm the PE fund has acquired. This collected data, however, comes with some limitations as well. Firstly, identity on the initial ownership types (family etc.) is not available. Secondly, exact initial ownership stakes are not

available in all cases. Moreover, as earlier explained I do not have exact ownership information of the benchmark firms this procedure only enables me to perform the hypothesis test on the reduced sample of portfolio firms.

Hypothesis 1 is tested by examining whether there is an effect on portfolio firm performance from a changed level of ownership concentration around the buyout. Here the changed degree of ownership concentrated is a proxy for changed agency costs. It is expected that higher post-buyout ownership concentration leads to fewer agency costs. From the gathered data a variable is constructed which defines whether the difference between ownership stakes of the majority owner before and after the transaction has fallen or gone up. This variable is used to split the sample in the two subgroups. For example the pre-buyout owner could be a family or an industrial, whereas the post-buyout majority owner is a PE fund. Thus two subgroups of portfolio firms are defined: 1) portfolio firms where the ownership concentration has increased, 2) portfolio firms where the ownership concentration has decreased or remained the same. Then regressions for both subgroups are performed and the difference between the performance estimates of PE fund ownership in the subgroups is statistically tested. The econometric specification is similar to the previous one except that industry dummies are now left out due to the smaller sample size since only portfolio firms are investigated here.

Another approach could be to investigate portfolio firms that were pre-buyout family owned, i.e. a proxy for concentrated ownership. Using ownership and management data from KOB it showed difficult since few firms could be characterized as family firms. The definition used is if the CEO of a firm owns more than 5% of the ownership it is categorized as a family firm (among others used by Anderson and Reeb, 2003). The few examples found are potentially due to a small sample of buyouts or that the CEO does not necessarily register the ownership in her own name (e.g. through a holding company). Due to these limitations this approach was further neglected. In addition data regarding ownership identity was collected, however, only 15 family buyouts were reported and due to this small sample further analysis was not pursued.

3.2.2. The Debt hypothesis

The free cash flow hypothesis (Jensen, 1986a, 1986b, 1989; Palepu, 1990) argues that the primary source of wealth gains in LBOs is brought about by organizational changes which lead to improvements in firm operating and investment decisions. Thus, in companies with large cash flows the management may have incentives or are prone to follow the so-called 'empire building' strategy, i.e. grow the firm beyond optimal size. The management can thus be tied through leverage (exchanging debt for equity) and is forced to 'bond their promise' to pay out future cash flows (interest payments), rather than investing in potentially poor projects. This is believed to be a more efficient use of the free cash flow. Further, the management is forced to produce enough cash flow to repay the debt obligations.
Hence, the control function of debt arguably plays a crucial role in monitoring these companies. In particular, Jensen (2007) argues that one of the advantages of this organizational form is that debt is placed at the divisional level. The idea is that when debt is placed closer to the responsive management it affects their incentives beneficially. Especially this is different compared with the old setup of conglomerates where debt was placed at the top (headquarter) level.

Remark that it might be that this hypothesis is less applicable in already privately-held firms since they usually initially have a strong owner. Hence, debt as a monitoring tool might at least theoretically be less influential.

Hypothesis 2: *Portfolio firms that are monitored through the debt tool are experiencing larger wealth gains.*

The question is whether the debt monitoring tool leads to performance improvements because the management is tied up. This proceeds in 3 steps. First, it is tested whether the debt ratio has an impact on portfolio firm performance. Secondly, it is tested how portfolio firm performance was affected by a change in capital structure around the buyout. Finally, I test whether the use of expensive financing has a severe effect, i.e. if short-term debt has an especially strong monitoring effect on portfolio firm

performance. Remark, that hypothesis 2 also uses the basic econometric specification from section 3.1., meaning that effects on portfolio firms are found relatively to control firms.

The first test is performed by running a regression where the key explanatory variable is the interaction term between the PE fund ownership dummy variable ($PEF_{i,t}$) and the firm-specific debt to assets ratio ($DEBTASS_{i,t}$). This specification captures the effect of being PE fund owned combined with the firm leverage level. It should illustrate whether PE funds are able to improve performance from the level of debt-to-assets. If the free cash flow hypothesis holds β_1 should be significantly positive. The econometric specification is otherwise as described earlier, the controls are firm size, firm age and industry.

$$y_{it} = \alpha + \beta_1 (PEF * DEBTASS)_{it} + \beta_2 DEBTASS_{it} + \beta_j Controls + e_{it}$$

Next, I want to measure whether portfolio firms are doing better when leverage has increased after the ownership change. As a proxy for this a dummy variable assigns a firm with the value of one if the average post-buyout (post-ownership change) debt ratio is larger than the average pre-buyout (pre-ownership change) debt to assets ratio. Otherwise firms are assigned with the value of zero if the average debt to assets ratio has remained unchanged or fallen. This variable is denoted *DEBT_MON* and is a proxy for debt monitoring. Using this I introduce another interaction variable between the PE fund ownership dummy variable ($PEF_{i,t}$), and the proxy for debt monitoring ($DEBT\_MON_i$). It measures the effect of being PE fund owned together with being exposed to debt monitoring and will more directly test the free cash flow hypothesis. Hypothesis 2 is thus satisfied if there is a positive significant impact on portfolio firm performance from this interaction term (proxy for the *debt monitoring* tool used by PE funds). In this specification there is controlled for the debt monitoring proxy together with the initial controls (firm size, firm age and industry affiliation).

$$y_{it} = \alpha + \beta_1 (PEF * DEBT\_MON)_{it} + \beta_2 DEBT\_MON_i + \beta_j Controls + e_{it}$$

In the final step short-term debt information is applied because debt with shorter maturity is traditionally more expensive and therefore will have a greater incentive effect (among others Cotter and Peck, 2001). Furthermore, it is relevant to test the impact of short term debt since it is widely used in these kinds of transactions (Cotter and Peck, 2001). The proxy of having large short-term debt obligations is defined as if the average short-term debt obligations accounts for more than 95 percent of the average total debt – which is corresponding to the 75-fractile. If this is the case the variable equals one, otherwise if the short-term debt accounts for less than that criteria the variable equals zero. Next, this dummy variable ($STDEBT\_MON_i$) is multiplied with the PE fund ownership dummy variable ($PEF_{i,t}$). This interaction measures the effect of being PE fund owned together with being exposed to high short-term debt monitoring. If hypothesis 2 is satisfied there should be a positive effect on portfolio firm performance from this variable. I believe that this proxy is a better test of the free cash flow hypothesis. The controls are as before.

$$y_{it} = \alpha + \beta_1 (PEF * STDEBT\_MON)_{it} + \beta_2 STDEBT\_MON_i + \beta_j Controls + e_{it}$$

As previously mentioned a limitation here is the focus on the portfolio company, i.e. not the holding company level. This is a problem since a substantial fraction of the debt is placed at the holding company level, however, debt is also issued at the portfolio firm. The full impact of debt is therefore not necessarily captured. Even though it is not the first best solution one might still get some useful insights on how portfolio firm level debt (it is still increasing) affects firm efficiency.

3.2.3. Stakeholder Expropriation hypothesis

The redistribution of rents from corporate stakeholders (employees, creditors, tax authorities etc.) to shareholders – the stakeholder expropriation hypothesis - states that owners may behave opportunistic such that they benefit themselves while harming stakeholders (e.g. Shleifer and Summers, 1988; Marais et al., 1989; Renneboog and Simons, 2005). Shleifer and Summers (1988) define expropriation as a breach of implicit contracts. The idea is that complete contracting is costly and therefore many

relationships between especially the management and stakeholders are based on trust. However, a new owner is not necessarily committed to uphold implicit contracts with stakeholders made by the incumbent management. For instance if the new owner removes the incumbent manager it can then renege on the contracts and expropriate rents from stakeholders.

Expropriation can take different forms – leverage affects tax payments, monetary transfers through dividend, asset stripping, wage reductions or employee layoffs etc. Since increasing debt is part of the LBO design and are for other reasons potentially beneficial (see hypothesis 2) expropriation through debt will not be further pursued in this analysis. Taxes are also neglected due to poor data availability. Instead the primarily focus is on investigating the dividend policy. Further, it is also tested whether layoffs are present in data. However, stakeholder expropriation is not necessarily social economic inefficient. For instance, the operating improvements from layoffs may outweigh the social costs.

Hypothesis 3: *PE funds are more likely, and more sensitive if 'shocks' occur, to pay out higher dividends compared to other firms, i.e. leaving the portfolio firms with fewer funds for re-investments.*

In hypothesis 3 I test whether PE funds are more likely to expropriate than other owners. A direct test is therefore whether dividends are affected by PE fund ownership – and also if portfolio firms are more sensitive in the dividend payout policy than the control group. By sensitive it is meant that firms could overreact or under react due to economic 'shocks' in the aggregate industry trend of dividends. Influenced by the econometric methodology of Bertrand et al. (2002) on tunneling in business groups it is examined how sensitive portfolio firms are in their dividend policy towards changes in the predicted industry levels of dividends compared to similar firms. The dependent variable is the firm-specific dividend payout ratio ($DIV_{i,t}$) and as explanatory variables the dividend payout industry average ($DIV\_IND_{i,t}$) and an interaction term between the dividend payout industry average and the PE fund ownership dummy variable ($PEF_{i,t}$) are employed. This industry average measure *(DIV_IND)* can be interpreted as the

predicted firm-specific dividend payout ratio or the dividend payout ratio in absence of expropriation. The interaction variable captures the differential sensitivity of portfolio firms. So, if the expropriation hypothesis is apparent portfolio firms are expected to have higher dividend payout ratios and to be more sensitive towards changes in industry levels of dividends, i.e. β_2 should be positive. Furthermore, firm size, firm age, industry dummies and year dummies ($Year_t$) serves as controls. Different measures of the industry dividend payout ratios averages are applied.

Summing up, the coefficient β_1 measures the general sensitivity of firms to industry dividend ratio levels, and the interaction term *(PEF*DIV_IND)* captures the differential sensitivity of portfolio firms. If portfolio firms are more sensitive, as expropriation would predict, then β_2 should be positive.

Finally, hypothesis 3 is also tested by assessing the impact of PE fund ownership on size and growth of employees, i.e. proxies for layoffs.

$$DIV_{it} = \alpha + \beta_1 DIV\_IND_{it} + \beta_2 (PEF * DIV\_IND)_{it} + \beta_j Controls + e_{it}$$

4. Results

4.1. The performance impact of PE fund ownership

Table 3 presents the relative impact of PE fund ownership using different measures of firm performance (*GROA, OROA, ROA, asset turnover, ROCE and asset growth*).
The measures of operating performance (*GROA, OROA and ROA*) all suggest that portfolio firms (at a 1-percentage significance level for all the estimations except *OROA*) underperform compared to a set of comparable firms. More specific, post-buyout operating profitability is on average between 2 and 8 percentage points lower for portfolio firms relatively to the control firms – these are changes of substantial magnitude. The effect is largest on *GROA*. However, it appears from table 2 that the portfolio firms still have positive profit margins. The results are robust to different econometric specifications - using industry dummies or fixed effects.

Table 3
The Impact from Private Equity Fund Ownership on Firm Performance

The table reports OLS regressions on all companies (PE fund owned and non-PE fund owned) over the period 1991-2004. Eqs. (1), (3), (5), (7), (9) and (11) use industry dummies while eqs. (2), (4), (6), (8), (10) and (12) use fixed effects. The dependent variables are yearly operating profit margins (gross profits to total assets, GROA; primary result to total assets, OROA; netincome to total assets, ROA; return on capital employed is measured as primary result relatively to debt plus equity, ROCE), yearly asset turnover (sales to total assets) and yearly asset growth.

The explanatory variable private equity (PE) fund ownership is a dummy variable that equals one every year a PE fund owns the firm and otherwise zero (including control firms). Control group firms are matched on size and industry from a sample of firms that has been through an ownership transition within the period. 73 portfolio firms and 545 controls firms are employed. Each portfolio firm is matched with up to the 5 nearest firms within each year, measured on absolute asset size. Robust standard errors are below the parameter estimates. The ***, ** and * denotes respectively whether the difference in the means between the portfolio firms and control group firms is significantly different from zero at a 1, 5 or 10-percentage level.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Dependent variable	*GROA*		*OROA*		*ROA*		*Asset turnover*		*ROCE*		*Asset growth*	
Constant	0.7350 ***	1.5240 ***	-0.0808 *	-0.1838	-0.0898 ***	-0.0667	0.7669 ***	1.3483 ***	-0.0078	0.1796 *	0.0725	-0.3721
	0.0685	0.3588	0.0419	0.1389	0.0275	0.0772	0.0499	0.1401	0.0385	0.0971	0.0577	0.2663
PE fund ownership	**-0.0537** ***	**-0.0836** ***	**-0.0236** **	**-0.0695** ***	**-0.0320** ***	**-0.0413** ***	**0.0175**	**-0.0171**	**-0.0155**	**-0.0661** *	**-0.1057** ***	**-0.1051** ***
	0.0190	0.0306	0.0103	0.0203	0.0104	0.0156	0.0132	0.0141	0.0156	0.0374	0.0233	0.0389
Log of totalassets	-0.0321 ***	-0.0910 ***	0.0076 **	0.0237 *	0.0054 **	0.0079	0.0038	-0.0511 ***	0.0045 *	-0.0026	0.0205 ***	0.1359 ***
	0.0060	0.0355	0.0035	0.0142	0.0023	0.0078	0.0044	0.0126	0.0026	0.0098	0.0054	0.0252
Firm age	0.0516 ***	0.0341	0.0173 ***	-0.0045	0.0166 ***	0.0054	0.0352 ***	0.0542 **	0.0130 ***	-0.0219	-0.0623 ***	-0.3523 ***
	0.0077	0.0277	0.0039	0.0166	0.0031	0.0122	0.0059	0.0230	0.0043	0.0182	0.0107	0.0450
Industry controls	YES		YES		YES		YES		YES		YES	
Fixed effects		YES		YES		YES		YES		YES		YES
Observations	*2720*	*2720*	*2976*	*2976*	*3025*	*3025*	*2022*	*2022*	*2268*	*2268*	*2718*	*2718*
R-square	*0.114*		*0.062*		*0.070*		*0.146*		*0.061*		*0.060*	
R-square within		*0.073*		*0.018*		*0.007*		*0.056*		*0.012*		*0.077*
R-square between		*0.015*		*0.005*		*0.021*		*0.003*		*0.034*		*0.029*
R-square overall		*0.021*		*0.008*		*0.018*		*0.007*		*0.002*		*0.024*

Other performance measures are also examined but the effects are not as strong as for the operating measures. *Asset growth* is significantly lower by 11 percentage points. One explanation could be that since portfolio firms are larger ex ante the lower relative *asset growth* is due to the fact that control firms are smaller and therefore maybe in a better position to grow. Further, significantly lower growth rates in sales and in number of employees are also found for the portfolio firms but these results are not reported.[30] The effect on *ROCE* is negatively though only significant for the fixed effects model. Finally, the model estimated for *asset turnover* controlling for industry effects gives us the only positive result but insignificant for PE fund ownership. Remember from table 2 that post-buyout portfolio firms have a significantly fall in this ratio. Notice that *asset turnover* is sometimes interpreted as a proxy for managerial efficiency, i.e. the more sales the management generate from firm investments (assets) the better. Thus managerial efficiency does not seem to be improved either. As discussed earlier firms are not obliged to report sales figures so the use of this measure may introduce a positive bias on the ratio if firms with sales growth are more likely to report.

In table 4 I perform the equivalent analysis for operating performance by applying the difference-in-difference methodology. Using event windows of -1/+3 years and -3/+3 years similar to earlier studies (e.g. Kaplan, 1989a; Smith, 1990) the present results are not altered. The impact is even larger since *GROA* is 13-15 percentage points lower, *OROA* is 6 percentage points lower, and *ROA* is 4-5 percentage points lower than the benchmark firms. The main findings are thus supported and crucially it does not seem as if the results are driven by the choice of econometric specification – standard OLS or difference-in-difference methodology. However, I proceed with the initial empirical methodology due to the reasons discussed earlier.

The main finding is inconsistent with the majority of the most comparable studies (Kaplan, 1989a; Smith, 1990; Cressy et al., 2007; Guo et al., 2007) yet it is supported by Desbrières and Schatt (2002) and also partly by Guo et al. (2007). These mentioned

[30] Remember that the asset growth is examined since, as earlier noted, firms are not obliged to report firm sales or firm employment – hence looking at sales and employment could introduce a bias because a firm may only report numbers of e.g. sales if they had improved. On average these are significantly 5 and 8 percentage points lower for respectively sales growth and employee growth.

studies have documented highly diverse magnitude of effects on firm performance. For instance Kaplan (1989a) finds that the operating income of 48 MBOs in the U.S. during 1980-1986 increased by 42% over a three-year period after the buyout. Whereas Cressy et al. (2007) documents an increase in operating profitability of about 4-5%. A study on USA that investigated a similar period 1990-2006 found that gains in operating performance are either comparable to or exceeding applied benchmarks (Guo et al., 2007). Depending on event window and performance measures used the significantly change ranges between minus 8% to plus 29%. Hence, according to this study the results from the more recent buyout activity indicate a weaker association between PE fund ownership and operational performance improvements.[31]

Table 4
The Impact from Private Equity Fund Ownership on Firm Operating Performance: Difference-in-Difference approach

The table reports OLS regressions on all companies (PE fund owned and non-PE fund owned) over the period 1991-2004. The dependent variables measures the differences in yearly operating profit margins (gross profits to total assets, GROA; primary result to total assets, OROA; netincome to total assets, ROA) - and the event windows are: minus 1 year before the buyout to 3 years after the buyout, and minus 3 years before the buyout to 3 years after the buyout.

The explanatory variable private equity (PE) fund ownership is a dummy variable that equals one in the year of entry - and zero for control firms. Control group firms are matched on size and industry from a sample of firms that has been through an ownership transition within the period. Each portfolio firm is matched with up to the 5 nearest firms within each year, measured on absolute asset size. The event year corresponds to the buyout year. The controls are firm size (log of total assets) and firm age (log). Robust standard errors are below the parameter estimates. The ***, ** and * denotes respectively whether the difference in the means between the portfolio firms and control group firms is significantly different from zero at a 1, 5 or 10-percentage level.

	-1/+3 year event window			*-3/+3 year event window*		
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
Dependent variable	*GROA*	*OROA*	*ROA*	*GROA*	*OROA*	*ROA*
Constant	-0.0073	-0.0286	0.0262	0.1435	0.0028	0.0002
	0.0950	0.0882	0.0660	0.1503	0.0828	0.0544
PE fund ownership	**-0.1458** ***	**-0.0570** **	**-0.0461** *	**-0.1299** **	**-0.0595** ***	**-0.0404** *
	0.0479	0.0247	0.0241	0.0636	0.0231	0.0239
Controls	YES	YES	YES	YES	YES	YES
Observations	610	689	698	374	435	441
R-square	0.013	0.003	0.004	0.030	0.009	0.014

Overall, the results from table 3 and 4 support the evidence from table 2. To sum up, PE fund ownership and its so-called superior corporate governance model does not

[31] A related study on hedge fund ownership shows that accounting performance drops after the entry of hedge funds in the ownership of target firms (e.g. Klein and Zur, 2006).

seem to have a beneficial impact on portfolio firm performance – on the contrary post-buyout performance measures falls relatively to a set of comparable firms.[32]

4.2. Goodwill-adjusted performance effects

The results so far could be driven by asset boosting within the portfolio firms. Asset boosting is a common feature in acquisitions and especially PE fund transactions where post-buyout goodwill is often written up. Goodwill adjustments are mainly due to differences in takeover price and actual firm values. Asset boosting or large asset growth is problematic for this analysis since it increases the asset base and thus automatically lowers the used performance measures. In the present data, however it does not seem to be the case since *asset growth* in portfolio firms is lower than for the benchmark firms (see table 2). It could be that asset boosting takes place at the holding company level and not at the portfolio firm level which is my focus.

Even though there is little support for the asset boosting argument in my data it will be investigated thoroughly by attempting to goodwill adjust the results. This is done by estimating the size of goodwill adjustments. It is proxied that goodwill adjustments equal the change in firm equity plus retained earnings (net income subtracted dividend payments, *REarnings*). Hence, it measures changes in equity which are not attributable to retained earnings. This estimate is then subtracted from the total assets and the new goodwill adjusted total assets are now used as the base when calculating the performance measures and the potential bias from goodwill valuations are removed.

$$Goodwill_t = \left(Equity_{t-1} - Equity_t\right) + REarnings_t$$

$$Totalassets_{adjusted,t} = Totalassets_t - Goodwill_t$$

[32] The results remain robust when only PE fund ownership with more than 2 years duration is investigated (not reported).

Table 5
The Impact from Private Equity Fund Ownership on Firm Performance - Goodwill Adjusted

The table reports OLS regressions on all companies (PE fund owned and non-PE fund owned) over the period 1991-2004. Eqs. (1), (3), (5), (7), (9) and (11) use industry dummies while eqs. (2), (4), (6), (8), (10) and (12) use fixed effects. The dependent variables are yearly goodwill-adjusted operating profit margins (gross profits to goodwill adjusted total assets, GROA; primary result to goodwill adjusted total assets, OROA; netincome to goodwill adjusted total assets, ROA; return on capital employed (ROCE) is measured as primary result relatively to (goodwill adjusted) debt plus equity, ROCE), yearly asset turnover (sales to goodwill adjusted total assets) and yearly goodwill adjusted asset growth.

The explanatory variable private equity (PE) fund ownership is a dummy variable that equals one every year a PE fund owns the firm and otherwise zero (including control firms). Control group firms are matched on size and industry from a sample of firms that has been through an ownership transition within the period. 73 portfolio firms and 545 controls firms are employed. Each portfolio firm is matched with up to the 5 nearest firms within each year, measured on absolute asset size. Goodwill is proxied as retained earnings in year t minus the change in equity in year t. Goodwill-adjusted total assets equals total assets minus the calculated goodwill proxy, and this measure is instead used as base variable when calculating the performance measures. For ROCE goodwill are also subtracted in the denominator. Robust standard errors are below the parameter estimates. The ***, ** and * denotes respectively whether the difference in the means between the portfolio firms and control group firms is significantly different from zero at a 1, 5 or 10-percentage level.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Dependent variable	*GROA*		*OROA*		*ROA*		*Asset turnover*		*ROCE*		*Asset growth*	
Constant	0.7883 ***	1.7670 ***	-0.0713	-0.2206	-0.0838 **	-0.0797	0.8325 ***	1.3575 ***	-0.0228	0.2122 *	-0.0477	-0.5668
	0.0819	0.4684	0.0533	0.1985	0.0337	0.0958	0.0586	0.1751	0.0442	0.1153	0.0691	0.3803
PE fund ownership	**-0.0663** ***	**-0.0901** ***	**-0.0122**	**-0.0772** ***	**-0.0223** **	**-0.0402** **	**0.0114**	**-0.0236**	**-0.0089**	**-0.0532** *	**-0.0578** **	**-0.1316** ***
	0.0205	0.0347	0.0131	0.0248	0.0109	0.0175	0.0132	0.0146	0.0159	0.0311	0.0288	0.0466
Log of totalassets	-0.0354 ***	-0.1090 **	0.0083 *	0.0241	0.0061 **	0.0090	-0.0008	-0.0470 ***	0.0067 **	-0.0139	0.0224 ***	0.1288 ***
	0.0070	0.0455	0.0043	0.0190	0.0028	0.0093	0.0053	0.0150	0.0031	0.0105	0.0065	0.0349
Firm age	0.0493 ***	0.0329	0.0120 ***	0.0094	0.0129 ***	0.0075	0.0306 ***	0.0398	0.0086 *	0.0149	-0.0341 ***	-0.2662 ***
	0.0085	0.0354	0.0040	0.0202	0.0033	0.0142	0.0070	0.1751	0.0048	0.0234	0.0124	0.0637
Industry controls	YES		YES		YES		YES		YES		YES	
Fixed effects		YES		YES		YES		YES		YES		YES
Observations	*2011*	*2011*	*2162*	*2162*	*2188*	*2188*	*1533*	*1533*	*1698*	*1698*	*1675*	*1675*
R-square	*0.148*		*0.049*		*0.064*		*0.129*		*0.060*		*0.036*	
R-square within		*0.102*		*0.021*		*0.008*		*0.052*		*0.009*		*0.058*
R-square between		*0.013*		*0.025*		*0.046*		*0.001*		*0.001*		*0.009*
R-square overall		*0.021*		*0.009*		*0.014*		*0.006*		*0.001*		*0.013*

Table 5 presents the goodwill adjusted models otherwise similar to the models from table 3. The models that are controlled for industry affiliation (1, 3, 5, 7, 9 and 11) again suggest a negative significant impact of PE fund ownership. The results are not as highly significant as the base models presented in table 3, for instance the negative effect on *OROA* is not significant on a 10 percentage level and the negative impact on *asset growth* is now also only significant on a 10 percentage level. The fixed effects models (2, 4, 6, 8, 10 and 12) are all except *asset turnover* strongly supportive of portfolio firm underperformance at a 10 percentage significance level.

Overall, after controlling for goodwill adjustments a negative impact of PE fund ownership is still found. Nevertheless, the findings also suggest that goodwill adjustments could be responsible for a small effect in the analysis. One problem with this approach is that many observations become excluded. It is therefore preferred to use non-adjusted performance measures in the following. Firstly, the results are not greatly altered and secondly since data limitations are avoided.

4.3. Robustness checks

4.3.1. Control groups

One concern is whether the results are depending on the choice of control group. This is addressed by modifying the matching criteria in three ways. Firstly, the condition that control firms must have realized a change in ownership is relaxed – meaning that control firms are now (only) matched by industry and size as described before. This approach yields 868 control firms. Appendix table A1 (panel A) shows the results and report that the negative impact on operating performance is significant at a 10 percentage significance level for all operating performance measures. It is a natural consequence since larger variation is introduced in the data, thus control firms are presumable not as identical to portfolio firms as in the first approach.

Next, the criteria for how many control firms should be incorporate are relaxed. Instead of including maximally 5 control firms per portfolio firm each year it is eased to

maximally 2 control firms per portfolio firm and year (before and after the buyout). The matching criteria are now the following; i) been through an ownership change; ii) is in the same industry (NACE classifications) and similar in size. Each portfolio firm is now matched with up to the 2 nearest firms measured on assets in each given year and industry. Nearest is defined as the squared annual difference between absolute values of total assets of portfolio firms and control firms. Using this approach 367 control firms are now employed. These estimations (panel B) show a strong significant result of underperformance of portfolio firms at a 5 percentage significance level for all operating performance measures together with *asset growth*. Again results on *ROCE* and *asset turnover* are insignificant.

Finally, the matching methodology is changed such that portfolio firms are first matched on size and industry, and secondly control firms that have not experienced an ownership change are excluded. Following this approach 446 control firms are now employed. The results are reported in panel C and show that PE fund ownership is (still) associated with lower portfolio firm performance.

In panel D firm size is compared between portfolio firms and control firms in the different control groups. Portfolio firms are larger (log of total assets) which is consistent with the characteristics of the main control group. This indicate that it is not (only) the matching methodology that explains diverging firm sizes between portfolio firm sample and control group sample.

The initial control group is preferred because a greater pool of firms is used as comparison and thereby the results are not depending on whether those (maximum) 2 control firms are well-suited as benchmarks.

4.3.2. Firm size

The results could depend on firm size and therefore firm size effects are treated in the following. It could be that PE funds are better at managing larger firms or that large buyouts proxy for highly-skilled PE funds with impressive prior results. I have already

controlled for firm size through log of assets in the econometric specifications but appendix table A2 shows the post-buyout impact on portfolio firms depending on firm size. It is defined that the average total assets of a large firm must exceed the median value[33] – thus below this threshold firms are considered as small. There are statistically differences between the subgroup regressions. In general large firms are worse off with PE fund ownership. PE fund ownership now has a positive but not significant impact on *GROA* for small firms. Further, managerial efficiency (*asset turnover*) is now very significantly improved by PE fund ownership among small firms. Both measures are statistically different between large and small firms. Overall, the main finding does not seem to be greatly affected by firm size – however if anything the results favour PE fund ownership in small firms. To some extend similar results are found in the venture capital (VC) literature since VC-backed firms[34] out-performs comparable firms (e.g. Kaplan and Schoar, 2005; Gompers et al., 2006).[35]

4.4. Hypotheses testing

4.4.1. The Ownership hypothesis

Hypothesis 1 is tested by investigating how changes in ownership structure affect post-buyout performance. The hypothesis predicts that portfolio firms which experience an increase in the ownership concentration around buyout time will benefit from elimination of agency costs, i.e. improved firm performance.

The test procedure is carefully explained earlier but the two following sub-samples are compared; 1) Where (majority) ownership concentration has increased (Panel B). 2) Where (majority) ownership concentration has fallen or remained the same (Panel C). Remember that availability of data only allows me to analyse the impact on the reduced sample of portfolio firms and not relatively to control firms. Through external data

[33] 109 mill. DKR is the median of an average firm's total assets in the sample. Remember that compared with other countries Danish firms are traditionally small or middle-sized.
[34] VC-backed firms are per definition small and in a growth-phase.
[35] The results are not greatly affected if the sample is divided into two groups by sample mean instead of sample median results. However, it should be noted that the statistical differences become more severe in favour of large firms (unreported). It is also checked whether the results were driven by specifically large portfolio firms. In particular the following large Danish companies - Nycomed, Superfos and Falck - are either separately or simultaneously excluded. Excluding these specific firms does not alter the results (not reported).

collection information on 42 of the 73 portfolio firms is gathered and approximately thirty percent of these portfolio firms experience an increase in the (majority) ownership concentration after the buyout. This alone is interesting since it is commonly argued that one benefit of the PE fund corporate governance model is improved monitoring through higher ownership concentration. On contrary, this data justify that the post-buyout ownership concentration in many cases fall. One reason could be that the initial owner stays in the ownership as a minority owner, e.g. a founding-family that keeps an ownership stake. However usable information on this is rather limited. Moreover, many deals concerns already privately-held firms thus the changes in the ownership concentration are relatively small. Altogether it indicates the presence of an opposite effect from the change in ownership concentration. This could explain the main finding of low portfolio firm performance.

In table 6 hypothesis 1 is tested by statistically testing the difference in the parameter estimates between the two sub-samples of portfolio firms. Table 6 shows that portfolio firms with a post-buyout increase in (majority) ownership concentration realizes a positive although insignificant impact on firm performance for all performance measures except *asset growth* from PE fund ownership (Panel B). Even though the impact is insignificant it is notable since previous results were strongly negative. Portfolio firms with a post-buyout decrease in ownership concentration experience a negative significant impact on firm performance as predicted (Panel C). Hence, it seems like changes in ownership concentration matters. Further, if these differences in the estimates are tested they are all significantly different except for *asset turnover*. Note, that even though the sample is small the results are still strongly significant. One could also compare the 95% confidence intervals of the estimates and similar to what is already found *GROA, OROA, ROA* and *ROCE* all falls outside each others confidence intervals (unreported).

The results found here seems to support hypothesis 1 which predicts that agency costs savings from better control and incentives leads to portfolio firm performance improvements. Moreover, the results support somewhat related studies (Kaplan, 1989a; Muscarella and Vetsuypens, 1990; Smith, 1990) thus implying that PE funds

accomplish gains from eliminating agency cost within firms where post-buyout ownership concentration is higher.
Furthermore, the result suggest that at least in this data portfolio firm underperformance could be explained by the fact that vast portfolio firms realizes a fall in the ownership concentration which leads to theoretically larger post-buyout agency costs.[36]

This finding also relates to the broader literature on ownership and firm performance. Demsetz and Lehn (1985) found no empirically relationship between ownership and performance, however, Morck et al. (1988) documented a non-linear relationship between ownership and performance. According to their study board ownership has a positive impact when the ownership stake ranges between of 0-5% and above 25%. In between (5-25%) there is a negative effect. Their finding somewhat support the PE fund (majority) ownership model. Furthermore, McConnell and Servaes (1990) investigated how equity ownership relates to corporate value. They suggest that corporate value increases with insider equity ownership up to approximately 40-50% of ownership and afterward there is a slightly negative relationship.

In this study it can only be demonstrated that post-buyout ownership concentration on average decreases, (mainly) due to high pre-buyout ownership concentration. Remark that Danish firms traditionally have a concentrated ownership, caused by the severe presence of family firms (Bennedsen et al., 2007). This spurs fewer potential benefits from post-buyout agency cost savings from ownership structure. A related study (Desbrières and Schatt, 2002) from France found that post-buyout performance dropped and that it was mainly caused by the large fraction of family buyouts, i.e. firms with pre-buyout concentrated ownership.

[36] An analysis was also performed on 2 subgroups of the reduced sample of portfolio firms: 1) portfolio firms with one owner at the buyout time (proxy for concentrated ownership), 2) portfolio firms with more than one owner at the buyout time. However, the regression results between these groups did not differ – both experienced a significant fall in performance. These results are not reported.

Table 6
Testing the Ownership Hypothesis

The table reports OLS regressions on the reduced sample of portfolio firms (excluding control firms) over the period 1991-2004. The dependent variables are yearly operating profit margins (gross profits to total assets, GROA; primary result to total assets, OROA; netincome to total assets, ROA; return on capital employed is measured as primary result relatively to debt plus equity, ROCE), yearly asset turnover (sales to total assets) and yearly asset growth.

The explanatory variable private equity (PE) fund ownership is a dummy variable that equals one every year a PE fund owns the firm and otherwise zero (the control firms are excluded). The data is divided into the two subgroups by measuring the difference in (majority) ownership concentration after and before the buyout. Thus if the ownership concentration has increased it falls in the group of firms with a post-buyout increase in ownership concentration. Otherwise if portfolio firms experience a fall in ownership concentration or if it remains unchanged it falls in the group with post-buyout decrease in ownership concentration. Robust standard errors are below the parameter estimates. The ***, ** and * denotes respectively whether the difference in the means between the portfolio firms and control group firms is significantly different from zero at a 1, 5 or 10-percentage level.

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable	*GROA*	*OROA*	*ROA*	*Asset turnover*	*ROCE*	*Asset growth*
A. All portfolio firms						
Constant	1.1792 ***	0.1298 ***	0.0751 ***	1.0972 ***	0.0236 ***	0.1611
	0.1344	0.0459	0.0114	0.0896	0.0427	0.1061
PE fund ownership	**-0.1771** ***	**-0.0576** ***	**-0.0544** ***	**-0.0417** ***	**-0.0548** ***	**-0.1056** ***
	0.0250	0.0111	0.0114	0.0144	0.0171	0.0279
Log of totalassets	-0.0501 ***	-0.0052	-0.0044	-0.0128	-0.0096 ***	0.0118
	0.0107	0.0035	0.0033	0.0084	0.0037	0.0094
Firm age	0.0365 ***	0.0140 ***	0.0146 ***	0.0016	-0.0008	-0.0425 **
	0.0107	0.0053	0.0048	0.0097	0.0055	0.0165
Observations	779	832	853	763	707	759
R-square	0.096	0.045	0.044	0.025	0.026	0.030
B. Post-buyout increase in ownership concentration						
Constant	-0.8314 **	0.0421	0.0699 *	1.1234 ***	0.3486 ***	0.1400
	0.3843	0.0567	0.0409	0.0748	0.1025	0.3499
PE fund ownership	**0.0266**	**0.0287**	**0.0295**	**0.0141**	**0.0290**	**-0.1542** ***
	0.0474	0.0225	0.0224	0.0178	0.0219	0.0565
Log of totalassets	0.1187 ***	0.0080 *	0.0023	-0.0121 *	-0.0166 **	0.0287
	0.0385	0.0049	0.0032	0.0069	0.0083	0.0373
Firm age	-0.0850 **	-0.0161 **	-0.0102 *	0.0045	-0.0048	-0.0988
	0.0396	0.0072	0.0056	0.0087	0.0081	0.0610
Observations	103	111	116	107	100	106
R-square	0.167	0.059	0.035	0.019	0.124	0.109
C. Post-buyout fall in ownership concentration						
Constant	2.0076 ***	0.2248	0.1221	0.9642 ***	0.0429	0.2228
	0.3072	0.1506	0.1582	0.1581	0.1450	0.3133
PE fund ownership	**-0.1382** ***	**-0.0689** ***	**-0.0485** **	**-0.0205**	**-0.0880** **	**-0.0405**
	0.0386	0.0214	0.0217	0.0250	0.0412	0.0559
Log of totalassets	-0.1198 ***	-0.0100	-0.0048	-0.0048	0.0065	0.0135
	0.0254	0.0128	0.0137	0.0137	0.0127	0.0250
Firm age	0.0753 ***	0.0080	0.0025	0.0148	-0.0059	-0.0767 ***
	0.0156	0.0076	0.0072	0.0132	0.0097	0.0267
Observations	276	292	296	275	233	259
R-square	0.216	0.043	0.025	0.009	0.022	0.036
Difference in estimates (Panel B-C)	***0.1648*** ***	***0.0976*** ***	***0.0780*** ***	***0.0346***	***0.1170*** ***	***-0.1137*** **
Standard error	*0.0412*	*0.0217*	*0.0219*	*0.0232*	*0.0365*	*0.0561*

The support for hypothesis 1 therefore provides us with a motive for public-to-private deals, i.e. PE funds should focus on publicly-traded firms since the ownership structure all else equal is more disperse than in privately-held firms. However, during 1991-2004

only about 15 percent of the Danish PE fund transactions were public-to-private transactions, but this may have changed lately. For example Thomsen and Vinten (2007a, 2007b) documents that the incidence of European going private transactions has increased the last decade.

4.4.2. The Debt hypothesis

Hypothesis 2 is examined through three different tests as discussed earlier. The results are shown in table 7. The first preliminary finding which is also supported by the results in table 2 is that PE fund ownership has a positive significant impact on the portfolio firm's debt ratio. On average the debt ratio increases by approximately 5 percentage points which is rather low when the LBO structure is taken into consideration. However, this is not surprising since most of the debt issuing takes place at the holding company level.

The first test of hypothesis 2 shows that there is a negative significant (except on *asset turnover*) impact from the interaction between PE fund ownership and the debt ratio level (see model 2, 5, 8, 11 and 14). Thus this specific test does not support the free cash flow hypothesis, yet this method does not take the pre-buyout debt structure or debt decomposition into account.

The second test of hypothesis 2 is performed by assuming that the debt monitoring tool is employed if the average post-buyout debt to assets ratio is above the average pre-buyout debt to assets ratio, i.e. a proxy for whether the debt monitoring tool is used. The key measure in this test is the interaction variable between the PE fund ownership dummy and the debt monitoring proxy. When using this definition approximately 70 percent of the portfolio firms are exposed to debt monitoring. The following models (3, 6, 9, 12 and 15) also suggest a negative significant impact on portfolio firm performance from this measure of the debt monitoring tool. Again the predictions from hypothesis 2 do not manifest themselves in the present data. It should be emphasized that a measurement problem might occur when this procedure is applied, due to a low

sample of portfolio firms in the non-debt monitoring tool sample. This is also why different empirical tests of the hypothesis 2 are performed.

Finally, I focus on determining the monitoring effect of debt with shorter maturity. Theoretically this monitoring tool is striking because the capital cost compared to longer termed debt obligations is higher. The models (4, 7, 10, 13 and 16) present evidence of the free cash flow hypothesis. Estimations show that this debt monitoring proxy has a positive and significant impact on *GROA* and *asset turnover* but a negative insignificant effect on *OROA* and *ROA*. The results on *GROA* and *asset turnover* are the ones which lends support to the free cash flow hypothesis. However, it is a crude proxy since according to it only 20 percent of the portfolio firms are exposed to short-term debt monitoring – however this should only make it more difficult to obtain significant results.[37]

Little evidence of the free cash flow theory is found in my analysis. This contradicts the findings of earlier studies (e.g. Baker and Wruck, 1989; Kaplan, 1989a; Cotter and Peck, 2001; Nikoskelainen and Wright, 2005; Cressy et al., 2007).[38] However, it seems like short-term debt is a more sufficient monitoring tool since it may lead to performance improvements. One main reason why little evidence of the free cash flow hypothesis is found could be that this analysis is performed at the parent company level. However, in many such deals capital structure is mostly affected at the holding company level. This will unfortunately not be captured by this approach. Another explanation could be that buyouts are today less leveraged compared earlier transactions in the 1980s (Kaplan and Stein, 1993; Guo et al., 2007). However, since data from the 1980s is not available here this argument can not be further tested.

Intriguingly, Axelson et al. (2007) raises a different motivation for high firm debt – namely that debt mitigates governance problems between limited partners and general partners at the PE fund level.

[37] The positively significant results becomes insignificant when the assumption of having large short-term obligations are lowered from the 75-fractile (95% of the total debt is short-termed debt) to the median (80% of the total debt is short-termed debt). This indicates that these results are dependent on choice of short-term debt level.
[38] Other studies has also suggested that the free cash flow hypothesis determines LBO activity (e.g. Lehn and Poulsen, 1989; Opler and Titman, 1993).

Table 7
Testing the Debt Hypothesis

The table reports OLS regressions with industy dummies on all companies (PE fund owned and non-PE fund owned) over the period 1991-2004. The dependent variables are yearly debt-to-assets ratio and yearly operating profit margins (gross profits to total assets, GROA; primary result to total assets, OROA; netincome to total assets, ROA), yearly asset turnover (sales to total assets) and yearly asset growth. The explanatory variable private equity (PE) fund ownership is a dummy variable that equals one every year a PE fund owns the firm and otherwise zero (including control firms). Control group firms are matched on size and industry from a sample of firms that has been through an ownership transition within the period. 73 portfolio firms and 545 controls firms are employed. Each portfolio firm is matched with up to the 5 nearest firms within each year, measured on absolute asset size.

DEBTASS is the debt-to-assets ratio so PEF*DEBTASS is the interaction term between PE fund ownership and firm debt-level (see eqs. (2), (5), (8), (11) and (14)). DEBT MONITORING is a dummy variable which assigns a firm with the value of 1 if the average pre-buyout (ownership change) debt-to-assets ratio is below the median and if the average post-buyout (ownership change) debt ratio is above the median. Otherwise zero. PEF*DEBT_MON is thus the interaction term between PE fund ownership and the use of the debt monitoring tool (see eqs. (3), (6), (9), (12) and (15)). SHORT-TERM DEBT MONITORING is a dummy variable which equals 1 if the average short-term debt accounts for more than 95 percent of the total debt. Otherwise zero. PEF*SHDEBT_MON is thus the interaction between PE fund ownership and the use of the short-term debt monitoring tool (see eqs. (4), (7), (10), (13) and (16)) . Robust standard errors are below the parameter estimates. The ***, ** and * denotes respectively whether the difference in the means between the portfolio firms and control group firms is significantly different from zero at a 1, 5 or 10-percentage level.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dependent variable	*Debt to assets ratio*	*GROA*			*OROA*		
Constant	0.690 ***	0.673 ***	0.736 ***	0.744 ***	-0.019	-0.073 *	-0.094 **
	0.031	0.069	0.069	0.069	0.037	0.043	0.044
PE fund ownership (PEF)	**0.047** ***						
	0.012						
PEF*DEBTASS		**-0.092** ***			**-0.028** *		
		0.030			0.016		
PEF*(DEBT MONITORING)			**-0.053** **			**-0.018** *	
			0.024			0.010	
PEF*(SHORT-TERM DEBT MONITORING)				**0.135** **			**-0.021**
				0.065			0.038
Debt to assets ratio		0.083 **			-0.089 ***		
		0.041			0.023		
DEBT MONITORING			0.007			-0.010	
			0.015			0.008	
SHORT-TERM DEBT MONITORING				0.005			0.033 ***
				0.021			0.010
Log of totalassets	-0.001	-0.032 ***	-0.033 ***	-0.034 ***	0.007 **	0.007 **	0.008 **
	0.003	0.006	0.006	0.006	0.004	0.004	0.004
Firm age	-0.024 ***	0.054 ***	0.051 ***	0.053 ***	0.015 ***	0.018 ***	0.018 ***
	0.005	0.008	0.008	0.008	0.004	0.004	0.004
Industry controls	YES	YES	YES	YES	YES	YES	YES
Observations	3020	2718	2720	2720	2972	2976	2976
R-square	0.063	0.116	0.113	0.113	0.071	0.062	0.065

	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	ROA			*Asset turnover*			*Asset growth*		
Constant	0.008	-0.085 ***	-0.102 ***	0.724 ***	0.780 ***	0.772 ***	0.016	0.054	0.062
	0.026	0.028	0.028	0.059	0.050	0.052	0.065	0.058	0.088
PEF*DEBTASS	**-0.034** **			**0.024**			**-0.161** ***		
	0.016			0.019			0.037		
PEF*(DEBT MONITORING)		**-0.035** ***			**0.014**			**-0.114** ***	
		0.012			0.017			0.028	
PEF*(SHORT-TERM DEBT MONITORING)			**-0.025**			**0.096** ***			**-0.158** **
			0.040			0.027			0.066
Debt to assets ratio	-0.142 ***			0.062 *			0.086 *		
	0.018			0.036			0.048		
DEBT MONITORING		-0.006			-0.023 **			0.049 ***	
		0.007			0.011			0.018	
SHORT-TERM DEBT MONITORING			0.034 ***			-0.012			0.025
			0.009			0.015			0.022
Log of totalassets	0.005 **	0.005 **	0.006 **	0.004	0.004	0.004	0.021 ***	0.020 ***	0.018 ***
	0.002	0.002	0.002	0.004	0.004	0.005	0.005	0.005	0.005
Firm age	0.013 ***	0.017 ***	0.018 ***	0.036 ***	0.037 ***	0.035 ***	-0.060 ***	-0.066 ***	-0.061 ***
	0.003	0.003	0.003	0.006	0.006	0.006	0.011	0.011	0.011
Industry controls	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	3020	3025	3025	2021	2022	2022	2714	2718	2718
R-square	0.104	0.070	0.073	0.149	0.147	0.147	0.062	0.061	0.056

4.4.3. Stakeholder Expropriation hypothesis

Table 2 may already indicate expropriation since dividend payouts increases together with falling equity ratio after the takeover. The number of employees does not significantly fall but post-growth in number of employees is lower compared to the control firms.

Table 8
Testing the Stakeholder Expropriation Hypothesis - Layoffs and the Dividend Policy

The table reports OLS regressions on all companies (PE fund owned and non-PE fund owned) over the period 1991-2004 including industry dummies and year dummies. The dependent variable in model 1 and 2 is respectively log of number of employees, whereas in model 3-5 it is the yearly dividend payout ratio - dividends to netincome.
The explanatory variable private equity (PE) fund ownership is a dummy variable that equals one every year a PE fund owns the firm and otherwise zero (including control firms). Control group firms are matched on size and industry from a sample of firms that has been through an ownership transition within the period. 73 portfolio firms and 545 controls firms are employed. Each portfolio firm is matched with up to the 5 nearest firms within each year, measured on absolute asset size. Notice that different measures of the dividend payout industry average are used - DIV_IND_AGG is the one that applies the most aggregate measure of industry affliation (22 grouping compared to 56 grouping). Robust standard errors are below the parameter estimates. The ***, ** and * denotes respectively whether the difference in the means between the portfolio firms and control group firms is significantly different from zero at a 1, 5 or 10-percentage level.

	(1)	(2)	(3)	(4)	(5)
Dependent variable	*Ln(Employees)*	*Employee growth*	*Dividend payout ratio*		
Constant	-5.6225 ***	-0.0986 **	0.3787 ***	0.2199 **	0.3501 ***
	0.1569	0.0470	0.0897	0.0896	0.0963
PE fund ownership (PEF)	**0.2773** ***	**-0.0527** **	**0.0869** **		
	0.0478	0.0229	0.0369		
PEF*DIV_IND				**0.1320** **	
				0.0594	
PEF*DIV_IND_AGG					**0.1449** ***
					0.0502
DIV_IND				0.2441 ***	
				0.0390	
DIV_IND_AGG					0.0498
					0.0547
Log of totalassets	0.8741 ***	0.0190 ***	-0.0152 ***	-0.0134 **	-0.0158 **
	0.0120	0.0049	0.0065	0.0063	0.0065
Firm age	0.1496 ***	-0.0461 ***	0.0461 ***	0.0439 ***	0.0468 ***
	0.0185	0.0093	0.0126	0.0122	0.0126
Industry controls	YES	YES	YES	YES	YES
Year dummies	YES	YES	YES	YES	YES
Observations	2735	2413	1390	1390	1390
R-square	0.8219	0.0587	0.053	0.084	0.055

In table 8 (log of) the number of employees and growth of employees are used as dependent variables (model 1 and 2). The regressions show that PE fund ownership has a positive effect on the number of employees, and a negatively significant impact on growth of employees (the impact is insignificant in the fixed effect model). This suggests that layoffs are on average not present in the data. However, portfolio firms grow less than comparable firms but note that these are also smaller.

Another direct proxy for expropriation is dividend payout which is the focus in the following. Especially, it is tested: i) whether portfolio firms are more likely to pay out dividends, and ii) whether the dividend policy of portfolio firms is more sensitive to changes in their own industry averages of dividend payout ratio.

Model 1 from table 8 shows that portfolio firms has on average a 9 percentage point higher dividend payout ratio than the control firms. Further we see that all tested models (2-3) document that portfolio firms are significantly more sensitive in their dividend payout policy. Hence, it could be interpreted as portfolio firms are over-responding to own industry changes in dividends, even though it seems like these firms initially are paying high dividends (see table 1). The results are robust to different aggregate measures of industry affiliations and thereby different definitions of the predictions of industry average.

These results regarding the dividend policy therefore indicate that expropriation or redistribution of wealth (hypothesis 3) is evident in the data. However, this approach says nothing about if this variation of expropriation leads to lower firm efficiency in the long run – nonetheless fewer funds are kept within the portfolio firms for new investments etc. Nor it says nothing about the social economic impacts.

The empirical literature has not paid much attention to these kinds of wealth transfers (Renneboog and Simons, 2005). Shleifer and Summers (1988) argues that new owners mainly expropriate the employees in hostile takeovers by reducing employment and wages. This present study does not find support for this. Lowenstein (1985) and Kaplan (1989b) shows that tax-related benefits should be added to the list of potential

expropriation of other stakeholders. Marais et al. (1989) finds through examining successful buyouts that bondholders are expropriated through downgradings in Moody's ratings. It is not possible to test tax and creditor exploitation using this data.

4.5. Alternative explanations

In the following different potential endogeneity problems in this analysis are addressed. There might be some underlying effects (observed or unobserved) that could bias the results. Since it is always difficult to find valid instruments the focus is instead on three alternative explanations: selection bias, valuation bias and measurement errors.

4.5.1. Selection bias

One problem with the interpretation of these kinds of analyses is the screening ability and preferences of PE funds. Hence, PE funds look for target firms with certain characteristics – for instance turnarounds or cash cows. This would introduce a selection bias in the results either positively or negatively. For instance back in the 1980s PE funds focused on acquiring inefficiently run firms, whereas in the latter LBO wave the focus is not only on inefficiently run firms. The selection bias will therefore interfere with our result if we compare portfolio firms with benchmark firms which might have the different characteristics. It has been argued in the literature that PE funds are especially good at managing turnaround firms (e.g. Cuny and Talmor, 2006). Yet, it is also documented that initial profitability in portfolio firms plays a major role in post-buyout performance, i.e. PE fund investment selection is crucial (Cressy et al., 2007).

This is also why the specific identification strategy is employed when matching the control firms because it aims at avoiding selection bias. In this data portfolio firms are slightly better performing than the benchmark firms both at the time of the buyout and at the four-year averages up to the ownership change (see table 1). It suggests a positive selection bias. Thus, a negative selection bias seems to be absent at the entry time. Nevertheless, the two groups of firms are not significantly different which indicates that

the positive selection bias does not prevail. Moreover, the main finding of lower post-buyout performance of portfolio firms also seems to reject the importance of the positive selection bias.

4.5.2. Valuation bias

If the performance measures applied are not appropriate for a comparison a valuation bias could occur. It may be claimed that portfolio firms differ from other privately-held firms and publicly-traded firms in various ways therefore operating performance is not necessarily the optimal performance measure to use.
Thus, other firm performance measures are also applied in the analysis – specifically *asset growth, asset turnover* and *ROCE*. Table 3 and 4 documented that these performances shows overall a lesser negative trend following the takeover compared to the operating measures. However, none of the measures documents a positive significant impact of PE fund ownership. Hence, the main finding of low performance in PE fund owned firms is not greatly affected by choice of performance measure.

From the point of view of PE funds appropriate operating performance measures should be held relative to total equity. If these performance measures (gross profits and primary results, all relative to equity) are applied results becomes insignificant in similar regressions to those in section 4.1 (see table 9). Problematically, when return on equity measures are used a positive bias is introduced since the post-buyout equity stakes are usually lowered. As a consequence such performance measures would automatically become positively biased which is also why this approach is neglected in the present analysis.

Sales or employees could be used as the base variable instead of assets. It will, however, introduce a potential bias in the analysis (as discussed earlier) since firms are not obliged to report this information. If these operating measures to sales or employees are investigated the overall conclusion remains the same - PE fund ownership is associated with lower performance (see table 9). However, the results for primary result

Table 9
The Impact from Private Equity Fund Ownership on other Firm Performance

The table reports OLS regressions on all companies (PE fund owned and non-PE fund owned) over the period 1991-2004. Eqs. (1), (3), (5), (7), (9) and (11) use industry dummies while eqs. (2), (4), (6), (8), (10) and (12) use fixed effects. The explanatory variable private equity (PE) fund ownership is a dummy variable that equals one every year a PE fund owns the firm and otherwise zero (including control firms). Control group firms are matched on size and industry from a sample of firms that has been through an ownership transition within the period. 73 portfolio firms and 545 controls firms are employed. Each portfolio firm is matched with up to the 5 nearest firms within each year, measured on absolute asset size. Robust standard errors are below the parameter estimates. The ***, ** and * denotes respectively whether the difference in the means between the portfolio firms and control group firms is significantly different from zero at a 1, 5 or 10-percentage level.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
			Gross profits to:						***Primary result to:***			
Dependent variable:	*Total equity*		*Net sales*		*Employees*		*Total equity*		*Net sales*		*Employees*	
Constant	1.009 ***	1.400 ***	0.210 ***	0.366	189.698 ***	-85.487	0.394 ***	0.488 *	-0.199 **	0.098 **	-19.522	-70.461
	0.123	0.384	0.066	0.223	34.144	104.803	0.077	0.287	0.080	0.100	15.732	51.734
PE fund ownership	**-0.036**	**-0.089**	**-0.061** ***	**-0.065** ***	**-33.664** **	**-30.057** **	**0.021**	**-0.042**	**-0.003**	**-0.037** **	**-17.198** ***	**-28.948** ***
	0.054	0.061	0.012	0.018	15.212	15.279	0.036	0.056	0.012	0.019	6.577	8.340
Log of totalassets	0.012	0.045	0.008	0.013	21.305 ***	35.156 ***	-0.015 **	0.015	0.012 *	-0.011	6.654 ***	9.867 **
	0.011	0.038	0.006	0.021	3.148	9.314	0.007	0.028	0.006	0.008	1.415	4.689
Firm age	0.084 ***	-0.209 ***	0.026 ***	-0.038 *	-9.731 *	52.025 ***	0.010	-0.123 ***	0.023 ***	0.027	0.708	12.773 *
	0.020	0.062	0.006	0.020	5.573	13.706	0.013	0.046	0.008	0.023	2.514	7.659
Industry controls	YES		YES		YES		YES		YES		YES	
Fixed effects		YES		YES		YES		YES		YES		YES
Observations	*2720*	*2720*	*1848*	*1848*	*2527*	*2527*	*2976*	*2976*	*1989*	*1989*	*2709*	*2709*
R-square	*0.043*		*0.116*		*0.119*		*0.019*		*0.057*		*0.083*	
R-square within		*0.012*		*0.032*		*0.044*		*0.006*		*0.005*		*0.012*
R-square between		*0.037*		*0.024*		*0.006*		*0.002*		*0.001*		*0.018*
R-square overall		*0.013*		*0.000*		*0.008*		*0.000*		*0.002*		*0.011*

become less significant. Moreover, note that a lot of information is excluded when sales is used as base variable.

Another approach could be to look at profit margins of the reduced sample of portfolio firms. In simple valuation models of firm value (among others Brealey and Myers, 2003) we know that firm valuation is very sensitive to profit margins. Hence, post-buyout profit margin development can be taken as a simple proxy for firm valuation. The analysis on the reduced sample is already conducted, see table 6 panel A. It finds that post-buyout profit margins drop which therefore can be interpreted as a (or a proxy for) drop in firm value. In the present data there is no information on firm pricing, hence, it is not possible to test whether it also holds when the portfolio firms are sold. However, a study on Danish data (Nielsen, 2005) documents that during 1995-2004 pension funds return on private equity had underperformed compared to public equity returns.

Another caveat could be that the accounting information of portfolio firms becomes less transparent. However, the study by Beuselink, Deloof and Manigart (2005) finds no support of this claim. On contrary Beuselink et al. finds that the quality of reported earnings becomes higher within PE fund backed firms.

4.5.3. Measurement errors

Another concern could be whether portfolio firms are evaluated at the proper time-span. Maybe the analysis should merely focus on portfolio firms where the PE fund has exited because it should be a more adequate way of measuring the exact impact of PE fund ownership (e.g. Muscarella and Vetsuypens, 1990; Cao and Lerner, 2006). Focusing on the intervening years of PE fund ownership potentially introduces a measurement error since we are not able to determine the ultimate impact of this owner class. However essential value creation or destruction could occur within the years of ownership. Only examining exits may also introduce an error – since it is most likely the well-performing firms that the PE funds are able to exit. Obviously, PE funds stay longer in distressed firms. Moreover, problematic with portfolio firm samples – are that

relatively few exits has taken place for the time being and therefore the analysis will be very limited. Further it requires a longer period of post-exit information which is not available since many exits has first taken place the recent years. Consequently I neglect this specific analysis.

Instead I address the timing issue differently by taking the time-length of the ownership into consideration, i.e. the J-curve effect. For example Burgel (2002) argues that venture capital investments follow such a J-curve pattern as explained earlier. This evolution is also applicable to the buyout market since portfolio firms may tend to underperform up to assumable the fourth year of PE fund ownership due to restructurings etc., and around the fourth year portfolio firms begin to outperform. This effect is examined by splitting up our main explanatory variable (PE fund ownership time-varying dummy variable) so it depends on the time-length of the ownership. Specifically, three different dummy variables are applied: 1) equals one when PE fund ownership is 1-2 years old, otherwise zero; 2) equals one when PE fund ownership is between 3-4 years old, otherwise zero; 3) equals one when PE fund ownership is more than 4 years old, otherwise zero. Thus these three variables should capture the impact on portfolio performance in respectively year 1-2, 3-4, and 5+. The general econometric specification is as previously explained.

From table 10 we see there is a significant negative impact on all operating performance in year 1-2 except for *asset turnover*. The parameter estimates are also significantly negative for the performance measures except *OROA* and *asset turnover* when evaluating year 3-4. Nevertheless, the results are not as robust for year 5+ and only *ROA* is significantly negative but at the 10 percentage significance level – while *GROA* and *OROA* are negatively affected but not significantly. Moreover, interestingly *asset turnover* now become strongly positively significantly affected by PE fund ownership in year 5+. However, as before this measure should be treated carefully due to data limitations. It does not seem like measurement errors are a major concern in this analysis, however result suggest that there might be some support for the J-curve predictions.

Table 10
Measuring the J-Curve Effects of Private Equity Fund Ownership

The table reports OLS regressions on all companies (PE fund owned and non-PE fund owned) over the period 1991-2004. The dependent variables are yearly operating profit margins (gross profits to total assets, GROA; primary result to total assets, OROA; netincome to total assets, ROA), yearly asset turnover (sales to total assets) and debt to assets ratio (debt is defined as the sum of short term debt and longterm debt).

The three explanatory dummy variables equals one when the private equity (PE) fund ownership is respectively 1-2, 3-4, and 5+ years old - otherwise zero (including control firms). Control group firms are matched on size and industry from a sample of firms that has been through an ownership transition within the period. 73 portfolio firms and 545 controls firms are employed. Each portfolio firm is matched with up to the 5 nearest firms within each year, measured on absolute asset size. The OLS regressions are otherwise similar to the ones in table 3 - thus we also apply the following controls: firm size (log of total assets), firm age (log), and industry affiliation. Robust standard errors are below the parameter estimates. The ***, ** and * denotes respectively whether the difference in the means between the portfolio firms and control group firms is significantly different from zero at a 1, 5 or 10-percentage level.

	Explanatory variables				
	PE fund ownership				
Dependent variables	*Year 1-2*	*Year 3-4*	*Year 5+*	*Obser-vations*	*R-square*
GROA	-0.0668 **	-0.0832 ***	-0.0466	2779	0.111
	0.0266	0.0321	0.0392		
OROA	-0.0246 *	-0.0120	-0.0230	3053	0.061
	0.0135	0.0144	0.0150		
ROA	-0.0353 **	-0.0416 **	-0.0442 *	3102	0.069
	0.0152	0.0195	0.0235		
Asset turnover	0.0070	-0.0061	0.0665 ***	2082	0.133
	0.0222	0.0255	0.0191		
Debt to total assets	0.0488 ***	0.0864 ***	0.0853 ***	3097	0.067
	0.0191	0.0202	0.0231		

Finally, another possible measurement error in this study is related to capital structure because the focus is on the parent company level. Thus holding company leveraging is neglected and therefore the entire effect on firm leverage from PE fund ownership as already discussed may not be completely captured. Thus, the effect on the capital structure within portfolio firms will be underestimated (measurement error). As mentioned the motivation of this study is to analyse value creation (or destruction) at the parent company level since these entities are the ones left after the exit, i.e. the long-term social perspective.

5. Discussion

This paper provides new evidence on the impact of PE buyout fund ownership on portfolio firm performance and on their governance abilities during the recent buyout activity. Analysing the population of 73 Danish portfolio firms compared with 545 benchmark firms I find strong evidence for a fall in firm performance of portfolio firms, also relatively to a control group. The results are also robust in comparison with different control groups and when performance measures are goodwill adjusted. This main finding indicates that the so-called superior PE fund governance model ("Jensen hypothesis") is rejected in the present data. Therefore this study contradicts the majority of the studies from the U.S. and U.K. (e.g. Kaplan, 1989a; Smith, 1990; Cressy et al., 2007; and partly Guo et al., 2007).

It is furthermore tested whether the PE fund governance model explains the main finding. Three theoretical hypotheses are tested – ownership, debt and stakeholder expropriation. One of the tests suggests that PE funds should focus on public-to-private deals due to possible gains from fewer agency costs, i.e. supportive of the ownership hypothesis. However, few of the Danish buyout deals were public-to-private transactions (15%) which also resemble the European case. This could explain why the expected effects of the PE fund governance model are not manifested in the present data. Moreover, in many of the deals the post-buyout ownership concentration decreased which thereby helps explain the main finding. Recent data from EVCA show that during the last 10 years European public-to-private transactions have only accounted for about 4% and 20% of respectively the number of all buyout deals or total deal value. This indicates that benefits from PE fund ownership are probably less likely to arise from changes in ownership structure.

It is also claimed that debt is a useful monitoring tool often used by the PE funds when controlling the management. Nevertheless, little support for this is found because it does not have a positive impact on portfolio firm performance, i.e. the crude form of the free cash flow theory (debt hypothesis) is not supported when the portfolio firm level is examined. However, it seems like debt with short maturity have a beneficial effect on firm efficiency. Also related to this result Guo et al. (2007) documents a fall

in how leveraged US buyouts have been compared to prior activity. Conversely, it is also argued in the literature that the monitoring advantage of debt is not at the firm-level but instead debt helps mitigate other governance problems at the fund level (Axelson et al., 2007).
It is also found that portfolio firms pay out higher dividends and are more positively sensitive in their dividend policy – this indicates the presence of expropriation. However, there are no indications of employee layoffs.

Additionally, alternative explanations are considered - selection bias, valuation bias and measurement errors. Overall, I find little support for these alternative explanations which validates the main results. Even though no strong support for the J-curve predictions are found it still appears that portfolio firms may undergo considerable changes in the first years of PE fund ownership and that the expected positive effects are first realized in the late years of ownership, i.e. PE funds maximise firm value given the time of exit.

According to the majority of the existing literature it is surprising that the effects from superior PE fund governance cannot be detected in the present data. The present findings are in line with a related French study (Desbrières and Schatt, 2002) which also found a drop in post-buyout portfolio firm performance. Desbrières and Schatt claim that their result is driven by high pre-buyout concentrated ownership since many of these transactions were family buyouts. Additional data suggest that only about 20% of the deals were family buyouts. Desbrières and Schatt's explanation may still apply here since a general attribute of the Danish ownership structure is the presence of highly concentrated ownership relatively to the U.S. and U.K. (e.g. Faccio and Lang, 2002; many family-owned firms, Bennedsen et al., 2007). Moreover, as described almost 85% of these deals were private-to-private transactions, hence, indicating pre-buyout concentrated owned portfolio companies. These considerations, as earlier mentioned, therefore suggest that due to high structural ownership concentration fewer benefits of the PE fund governance model are likely present. This could indicate that the superior governance model is not as applicable to the Danish PE market or in countries with traditionally high ownership concentration.

Thus there could be influential differences at the PE industry level between countries – for instance the Danish PE market is possibly at an early stage compared to the U.S. and U.K. Therefore Danish-based PE funds are maybe not as skilled and/or experienced as international competitors. This argument is however rather unlikely since most PE funds are now globally active and LBO transactions have been taking place for decades. Also related to the skills of PE funds it was found in this data that the acquired firms are not different performance-wise to comparable firms before the buyout, which might (weakly) indicate that PE funds are on average not able to 'pick the winners'.

On this background it may be relevant to raise the question – is private equity a superior investment? Using simple valuation methodology this present study indicates that it is most likely not. However, private equity may still be a good or even superior investment from the investors' point of view (e.g. Berg and Gottschalg, 2005). One reason could be that PE funds are good merchants – buying at the right time when prices are low and sell at a high. Or PE funds may have strong skills in the buyout negotiation process and by that end up paying less than other investors would. This view is, however, empirically supported by following studies Bargeron et al. (2007) and Thomsen and Vinten (2007b). Nevertheless, these value drivers have in principle nothing to do with the ability of PE funds to improve firm efficiency at the operational level. Moreover, if there is an underlying bubble in company pricing is present value creation may take place at the fund-of-fund level. Several studies find empirical evidence of an overheated buyout market hypothesis (Kaplan and Stein, 1993; Gompers and Lerner, 2000; Ljungqvist and Richardson, 2003). These studies also show that returns could become squeezed during a 'bubble' in firm takeover prices. Contradicting the argument that superior returns are made at the fund-of-fund level other studies find that private equity investments give a lower return than appropriate benchmarks (e.g. Gottschalg et al., 2004; Kaplan and Schoar, 2005; Nielsen, 2006; Gottschalg and Phalippou, 2007). Related to this, even though it is a firm-level study, I interestingly found that the screening ability or strategy of PE funds seem to be no better than other buyers because the portfolio firms at the entry time are on average not statistically different to an average benchmark firm performance-wise. Hence it does not seem like

PE funds are able to ‘pick the winners’ which could lower the returns at the fund-of-fund level.

Appendix

Table A1

The Impact from Private Equity Fund Ownership on Firm Performance - Alternative Control Groups

The table reports OLS regressions on all companies (PE fund owned and non-PE fund owned) over the period 1991-2004. The dependent variables are yearly operating profit margins (gross profits to total assets, GROA; primary result to total assets, OROA; netincome to total assets, ROA; return on capital employed is measured as primary result relatively to debt plus equity, ROCE), yearly asset turnover (sales to total assets) and yearly asset growth. The explanatory variable private equity (PE) fund ownership is a dummy variable that equals one every year a PE fund owns the firm and otherwise zero (including control firms).

The matching criteria of panel A's control group are: i) is in the same industry and similar in (total asset) size - up to the 5 nearest firms measured on absolute total assets within each year are employed. In this data set we have 4162 firm-year observations which is distributed among 868 control firms and 73 portfolio firms. The matching criteria of panel B's control group are: i) been through an ownership change, ii) is in the same industry and similar in (total assets) size. But here we only compare the portfolio firms with up to the 2 closest firms within each year measured on assets. In the data set in panel B there are 2113 firm-year observations, and there are 367 control firms and 73 portfolio firms. The matching criteria of panel C's control group are: i) is in the same industry and similar in (total asset) size - up to the 5 nearest firms measured on absolute total assets within each year are employed, i) been through an ownership change. Compared to the main approach used I here exclude control firms that have not experienced a change in ownership after matching on size and industry. In this data set we have 2621 firm-year observations - 446 control firms and 73 portfolio firms.

Again firm size (log of total assets), firm age (log of age) and industry dummies are used as controls. Robust standard errors are below the parameter estimates. The ***, ** and * denotes respectively whether the difference in the means between the portfolio firms and control group firms is significantly different from zero at a 1, 5 or 10-percentage level.

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable	*GROA*	*OROA*	*ROA*	*Asset turnover*	*ROCE*	*Asset growth*
A. Alternative control group 1 - without ownership change condition						
Constant	0.7106 ***	-0.0795 **	-0.0885 ***	0.6311 ***	-0.0521	0.0099
	0.0594	0.0357	0.0239	0.0482	0.0539	0.0554
Private equity fund ownership	**-0.0340** *	**-0.0225** **	**-0.0338** ***	**0.0208**	**-0.0181**	**-0.1208** ***
	0.0190	0.0102	0.0104	0.0135	0.0162	0.0233
Controls	YES	YES	YES	YES	YES	YES
Observations	3707	4024	4096	2611	2990	3687
R-square	0.103	0.047	0.048	0.147	0.051	0.057
B. Alternative control group 2 - max. 2 control firms per portfolio firm within each year						
Constant	0.8149 ***	-0.0560	-0.0730 **	0.7709 ***	0.0309	0.1196
	0.0772	0.0462	0.0333	0.0643	0.0554	0.0731
Private equity fund ownership	**-0.0632** ***	**-0.0245** **	**-0.0304** ***	**0.0090**	**-0.0217**	**-0.1061** ***
	0.0197	0.0100	0.0104	0.0134	0.0152	0.0243
Controls	YES	YES	YES	YES	YES	YES
Observations	1888	2044	2079	1491	1602	1869
R-square	0.120	0.061	0.061	0.110	0.045	0.067
C. Alternative control group 3 - first matched by size and industry and then by ownership change						
Constant	0.7515 ***	-0.1232 **	-0.1192 ***	0.7522 ***	-0.0341	0.0427
	0.0808	0.0503	0.0329	0.0562	0.0473	0.0648
Private equity fund ownership	**-0.0600** ***	**-0.0267** ***	**-0.0327** ***	**0.0066**	**-0.0165**	**-0.1098** ***
	0.0194	0.0102	0.0104	0.0133	0.0154	0.0238
Controls	YES	YES	YES	YES	YES	YES
Observations	2336	2536	2578	1762	1947	2311
R-square	0.116	0.066	0.072	0.131	0.057	0.070

D. Descriptive statistics - firm size

Firm size (log of total assets)	*Panel A*	*Panel B*	*Panel C*
PE fund owned	12.79	12.79	12.79
Standard errors	0.08	0.08	0.08
Non-PE fund owned	11.16	11.58	11.33
Standard errors	0.03	0.05	0.04
Difference	1.63 ***	1.21 ***	1.46 ***
Standard errors	0.08	0.12	0.09

Table A2
The Impact from Private Equity Fund Ownership on Firm Performance - Depending on Firm Size

The table reports OLS regressions on all companies (PE fund owned and non-PE fund owned) over the period 1991-2004. The dependent variables are yearly operating profit margins (gross profits to total assets, GROA; primary result to total assets, OROA; netincome to total assets, ROA; return on capital employed is measured as primary result relatively to debt plus equity, ROCE), yearly asset turnover (sales to total assets) and yearly asset growth.
The explanatory variable private equity (PE) fund ownership is a dummy variable that equals one every year a PE fund owns the firm and otherwise zero (including control firms). Control group firms are matched on size and industry from a sample of firms that has been through an ownership transition within the period. 73 portfolio firms and 545 controls firms are employed. Each portfolio firm is matched with up to the 5 nearest firms within each year, measured on absolute asset size. A firm is considered as large when average total assets are above (the sample median) 109 million DKR. Again firm size (log of total assets), firm age (log of age) and industry dummies are used as controls. Robust standard errors are below the parameter estimates. The ***, ** and * denotes respectively whether the difference in the means between the portfolio firms and control group firms is significantly different from zero at a 1, 5 or 10-percentage level.

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable	*GROA*	*OROA*	*ROA*	*Asset turnover*	*ROCE*	*Asset growth*
A. Large firms						
Constant	0.8914 ***	0.1727 ***	0.1097 ***	1.0378 ***	0.2126 ***	0.1183
	0.0776	0.0231	0.0217	0.0799	0.0294	0.1009
Private equity fund ownership	**-0.0868** ***	**-0.0186** *	**-0.0314** ***	**-0.0117**	**-0.0271**	**-0.1019** ***
	0.0191	0.0110	0.0116	0.0148	0.0187	0.0276
Log of totalassets	-0.0429 ***	-0.0102 ***	-0.0071 ***	-0.0114	-0.0104 ***	0.0160 *
	0.0066	0.0023	0.0019	0.0075	0.0030	0.0089
Firm age	0.0394 ***	0.0071	0.0047	0.0130	-0.0019	-0.0667 ***
	0.0095	0.0043	0.0035	0.0079	0.0055	0.0147
Industry controls	YES	YES	YES	YES	YES	YES
Observations	1355	1453	1495	1361	1229	1354
R-squared	0.150	0.112	0.101	0.151	0.094	0.060
B. Small firms						
Constant	0.6274 ***	-0.2676 **	-0.2015 ***	0.5493 ***	-0.1285	-0.2203 *
	0.1774	0.1156	0.0688	0.1303	0.0936	0.1288
Private equity fund ownership	**0.0712**	**-0.0520** **	**-0.0512** **	**0.0762** ***	**0.0113**	**-0.1135** **
	0.0502	0.0260	0.0254	0.0240	0.0227	0.0471
Log of totalassets	-0.0231	0.0232 **	0.0117	0.0079	0.0150 *	0.0520 ***
	0.0170	0.0109	0.0065	0.0116	0.0087	0.0128
Firm age	0.0639 ***	0.0233 ***	0.0270 ***	0.0722	0.0229 ***	-0.0642 ***
	0.0126	0.0070	0.0055	0.0109	0.0078	0.0165
Industry controls	YES	YES	YES	YES	YES	YES
Observations	1365	1523	1530	661	1039	1364
R-squared	0.102	0.086	0.100	0.379	0.094	0.077
Difference in estimates	***-0.1580*** ***	***0.0334*** *	***0.0198***	***-0.0879*** ***	***-0.0384*** *	***0.0116***
Standard error	*0.0380*	*0.0201*	*0.0198*	*0.0183*	*0.0206*	*0.0386*

References

1) Aghion, P., Bolton, P., 1992. An Incomplete Contracts Approach to Financial Contracting. *Review of Economic Studies* 59, 473-494.
2) Aghion, P., Tirole, J., 1997. Formal and Real Authority in Organizations. *Journal of Political Economy* 105(1), 1-29.
3) Alemany, L., Martí, J., 2005. Unbiased Estimation of Economic Impact of Venture Capital Backed Firms. Working paper.
4) Anderson, R., Reeb, D., 2003. Founding-Family Ownership and Firm Performance: Evidence from the S&P 500. *Journal of Finance* 58, 1301-1328.
5) Andrade, G., Kaplan, S., 1998. How Costly is Financial (Not Economic) Distress? Evidence from Highly Leveraged Transactions That Became Distressed. *Journal of Finance* 53(5), 1443-1493.
6) Axelson, U., Strömberg, P., Weisbach, M., 2007. Why are Buyouts Levered? The Financial Structure of Private Equity Funds. NBER Working paper no. 12826.
7) Bennedsen, M., Nielsen, K.M., Pérez-González, F., Wolfenzon, D., 2007. Inside the Family Firm: the Role of Families in Succession Decisions and Performance. *Quarterly Journal of Economics* 122(2), 647-691.
8) Baker, G., Wruck, K., 1989. Organizational Changes and Value Creation in Leveraged Buyouts – The case of the O.M. Scott & Sons Company. *Journal of Financial Economics* 25, 163-190.
9) Bargeron, L., Schlingemann, F., Stulz, R., Zutter, C., 2007. Why do Private Acquirers pay so Little Compared to Public Acquirers? NBER Working paper no. 13061.
10) Berg, A., Gottschalg, O., 2005. Understanding Value Generation in Buy-outs. INSEAD Working paper series 1.1.
11) Berle, A., Means, G., 1932. The Modern Corporation and Private Property. Macmillan.
12) Bertrand, M., Mehta, P., Mullainathan, S., 2002. Ferreting out Tunneling: An Application to Indian Business Groups. *Quarterly Journal of Economics* 117(1), 121-147.

13) Beuselink, C., Deloof, M., Manigart, S., 2005. Private Equity and Earnings Quality. Working paper.

14) Brealey, R., Myers, S., 2003. The Principles of Corporate Finance. Irwin McGraw-Hill Professional Publishing.

15) Burgel, O., 2000. UK Venture Capital and Private Equity as an Asset Class for Institutional Investors. Research report, London Business School.

16) Burkart, M., Gromb, D., Panunzi, F., 1997. Large Shareholders, Monitoring, and the Value of the Firm. *Quarterly Journal of Economics* 112(3), 693-728.

17) Cao, J., Lerner, J., 2006. The Performance of Reverse Leveraged Buyouts. NBER Working paper no. 12626.

18) Coase, R., 1937. The Nature of the Firm. *Economica* 4, 386-405.

19) Cotter, J., Peck, S., 2001. The Structure of Debt and Active Equity Investors: The Case of the Buyout Specialist. *Journal of Financial Economics* 59, 101-147.

20) Cressy, R., Munari, F., Malipiero, A., 2007. Playing to Their Strengths? Evidence that Specialization in the Private Equity Industry Confers Competitive Advantage. *Journal of Corporate Finance*, forthcoming.

21) Cumming, D., Siegel, D., Wright, M., 2007. Private Equity, Leveraged Buyouts and Governance. Working paper.

22) Cuny, C.J., Talmor, E., 2006. A Theory of Private Equity Turnarounds. Working paper.

23) Desbrières, P., Schatt, A., 2002. The Impacts of LBOs on the Performance of Acquired Firms: the French Case. *Journal of Business Finance and Accounting* 29, 695-729.

24) Faccio, M., Lang, L., 2002. The Ultimate Ownership of Western European Corporations. *Journal of Financial Economics* 65, 365-395.

25) Fama, E., Jensen, M., 1983. Separation of Ownership and Control. *Journal of Law and Economics* 26, 301-325.

26) Gompers, P., Lerner, J., 2000. Money Chasing Deals? The Impact of Fund Inflows on Private Equity Valuations. *Journal of Financial Economics* 55, 281-325.

27) Gompers, P., Kovner, A., Lerner, J., Scharfstein, D., 2006. Skill vs. Luck in Entrepreneurship and Venture Capital: Evidence from Serial Entrepreneurs. Working paper, Harvard University.

28) Gottschalg, O., Phalippou, L., Zollo, M., 2004. Performance of Private Equity Funds: Another Puzzle? Working paper, INSEAD and Wharton.

29) Gottschalg, O., Phalippou, L., 2007. The Performance of Private Equity Funds. Working paper.

30) Grossman, S., Hart, O., 1980. Take-over bids, the Free-rider Problem and the Theory of Corporation. *Bell Journal of Economics* 11, 42-64.

31) Guo, S., Hotchkiss, E., Song, W., 2007. Do Buyouts (Still) Create Value? Working paper.

32) Harris, R., Siegel, D.S., Wright, M., 2005. Assessing the Impact of Management Buyouts on Economic Efficiency: Plant-level Evidence from the United Kingdom. *Review of Economics and Statistics* 87, 148-153.

33) Jensen, M., 1986a. Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers. *American Economic Review* 76, 323-329.

34) Jensen, M., 1986b. The Takeover Controversy: Analysis and Evidence. *Midland Corporate Finance* 4(2), 6-32.

35) Jensen. M., 1989. Active Investors, LBOs and the Privatization of Bankruptcy. *Journal of Applied Corporate Finance* 2, 35-44.

36) Jensen, M., 2007. The Economic Case for Private Equity. Harvard NOM Research Paper No. 07-02.

37) Jensen, M., Meckling, W., 1976. Theory of the Firm: Managerial Behaviour, Agency Costs, and Ownership Structure. *Journal of Financial Economics* 3, 303-360.

38) Jensen, M., Kaplan, S., Ferenbach, C., Feldberg, M., Moon, J., Hoesterey, B., Davis, C., Jones, A., 2006. Morgan Stanley Roundtable on Private Equity and its Import for Public Companies. *Journal of Applied Corporate Finance* 18(3), 8-37.

39) Kaplan, S., 1989a. The Effects from Management Buyouts on Operations and Value. *Journal of Financial Economics* 24, 217-254.

40) Kaplan, S., 1989b. Management Buyouts: Evidence on Taxes as a Source of Value. *Journal of Finance* 44, 611-632.

41) Kaplan, S., Schoar, A., 2005. Private Equity Performance: Returns Persistence and Capital. *Journal of Finance* 60(4), 1791-1823.

42) Kaplan, S., Stein, J., 1993. The Evolution of Buyout Pricing and Financial Structure in the 1980s. *Quarterly Journal of Economics* 108(2), 313-357.

43) Klein, A., Zur, E., 2006. Hedge Fund Activism. ECGI Finance Working paper no. 140/2006.

44) Lehn, K., Poulsen, A., 1989. Free Cash Flow and Stockholder Gains in Going Private Transactions. *Journal of Finance* 64, 771-787.

45) Lichtenberg, F., Siegel, D., 1990. The Effects of Leveraged Buyouts on Productivity and Related Aspects of Firm Behaviour. *Journal of Financial Economics* 27, 165-194.

46) Ljungqvist, A., Richardson, M., 2003. The Investment Behaviour of Private Equity Fund Managers. Working paper, Stern School of Business, New York University.

47) Lowenstein, L., 1985. Management buyouts. *Columbia Law Review* 85, 730-784.

48) Marais, L., Schipper, K., Smith, A., 1989. Wealth Effects of Going Private for Senior Securities. *Journal of Financial Economics* 23, 155-191.

49) McConnell, J., Servaes, H., 1990. Additional Evidence on Equity Ownership and Corporate Value. *Journal of Financial Economics* 27, 595-612.

50) Morck, R., Shleifer, A., Vishny, R., 1988. Management Ownership and Market Valuation. *Journal of Financial Economics* 20, 293-315.

51) Muscarella, C., Vetsuypens, M., 1990. Efficiency and Organizational Structure: A Study of Reverse LBOs. *Journal of Finance* 45(5), 1389-1413.

52) Nielsen, K.M., 2006. The Return to Pension Funds' Private Equity Investments: Another Piece to the Private Equity Premium Puzzle? Discussion paper, Centre for Economic and Business Research.

53) Nikoskelainen, E., Wright, M., 2005. The Impact of Corporate Governance Mechanisms on Value Increase in Leveraged Buyouts. Working paper.

54) Opler, T., Titman, S., 1993. The Determinants of Leveraged Buyout Activity: Free Cash Flow vs. Financial Distress Costs. *Journal of Finance* 48(5), 1985-1999.

55) Palepu, K., 1990. Consequences of Leveraged Buyouts. *Journal of Financial Economics* 27, 247-262.

56) Prowse, S.D., 1998. The Economics of Private Equity Market. *Economic Review* 3rd Quarter 1998, Federal Reserve Bank of Dallas.

57) Ravenscraft, D., Scherer, F., 1987. Life after Takeover. *Journal of Industrial Economics* 36(2), 147-156.

58) Renneboog, L., Simon, T., 2005. Public-to-Private Transactions: LBOs, MBOs, MBIs and IBOs. ECGI Finance working paper no. 94/2005.

59) Rosenbaum, P., Rubin, D., 1983. The Central Role of the Propensity Score in Observational Studies for Causal Effects. *Biometrika* 70, 41-55.

60) Shadish, W., Cook, T., Campbell, D., 2002. Experimental and Quasi-Experimental Designs for Generalized Causal Inference. Boston: Houghton-Mifflin.

61) Shleifer, A., Summers, C.H., 1988. Breach of Trust in Hostile Takeovers, chapter 2 in Auerbach, A.J., ed., Corporate Takeovers: Causes and Consequences, Chicago: University of Chicago Press.

62) Smith, A., 1990. Corporate Ownership Structure and Performance. *Journal of Financial Economics* 27, 143-164.

63) Thomsen, S., Vinten, F., 2007a. Delistings in Europe and the Costs of Governance. Working paper, Copenhagen Business School.

64) Thomsen, S., Vinten, F. 2007b. Equity Market Timing and the Decision to Delist. Working paper, Copenhagen Business School.

65) Wright, M., Thompson, S., Robbie, K., 1992. Venture Capital and Management-led Leveraged Buy-outs: European Evidence. *Journal of Business Venturing* 7, 47-71.

66) Wright, M., Wilson, N., Robbie, K., 1997. The Longer term Performance of Management Buy-outs. *Frontiers of Entrepreneurship Research*, 555-569.

67) Økonomi- og Erhvervsministeriet (The Danish Ministry of Economic and Business Affairs; ØEM), 2006. Kapitalfonde i Danmark ('Private Equity Funds in Denmark'). Governmental report.

Delistings in Europe and the Costs of Governance[39]

Steen Thomsen[40]
Center for Corporate Governance
Copenhagen Business School

Frederik Vinten[41]
Copenhagen Business School
Centre for Economic and Business Research (CEBR)

Abstract:

In recent years there bas been a dramatic increase in delistings from stock exchanges in the US and Europe, and this trend has been partly attributed to increasing administrative costs in listed companies. Has corporate governance regulation gone too far? We examine delistings from European stock exchanges 1995-2005 and find that standard corporate governance regulation - like investor protection and corporate governance codes - is associated with more delistings and in particularly going private transactions. In contrast, the tendency to go private is found to be lower, when the quality of overall governance (World Bank governance index) is high. The results continue to hold when we take into consideration that governance policy may be endogenous.

JEL classifications: G14; G15; G18; G24; G32; G33; G34; G38; K20; K40.
Key words: Delisting, public listing, transaction costs, mergers, acquisitions, bankruptcy, liquidation, going private, private equity, investor protection.

---

[39] The paper has benefited from discussion at the Workshop on the Politics of Governance, Copenhagen Business School (2006); Department of Financial Economics, Norwegian School of Management (2006); DGPE Workshop, University of Aarhus and University of Copenhagen (2006); AIB (UK & Ireland) Annual Conference 2007, King's College London; The Academy of Management, Philadelphia, 2007. Comments by Morten Bennedsen, Øyvind Bøhren, Claudio Loderer, Florencio Lopez-de-Silanes and Holger Spamann are gratefully acknowledged.
[40] Professor Steen Thomsen, Director of the Center for Corporate Governance, Department of International Economics and Management, Copenhagen Business School, Porcelænshaven 24, DK-2000 Frederiksberg, Denmark. E-mail: st.int@cbs.dk.
[41] Frederik Vinten, PhD student, Department of Economics, Copenhagen Business School, and Centre for Economic and Business Research (CEBR). Porcelænshaven 16A, DK-2000 Frederiksberg, Denmark. E-mail: fv.eco@cbs.dk.

1. Introduction

Recent years have produced a wave of corporate governance regulation. Examples from the US are the Sarbanes-Oxley act and codes of best practice on both NASDAQ and NYSE. Commentators argue that the administrative costs of these initiatives have spurred delistings from US exchanges (Block, 2004; Engel et al., 2005; Marosi and Massoud, 2005; Kamar et al., 2006; Leuz et al., 2006).[42] Moreover, it has also been argued that the Sarbanes-Oxley regulation have led international companies to list elsewhere, e.g. in London. However, studies that have examined cross-listings (Doidge et al., 2007; Zingales, 2007) show that the benefits of being listed on a US stock exchange have not been eroded by the costs associated with the Sarbanes-Oxley act compared to the UK. Although Europe has not been subject to the rigor of the Sarbanes-Oxley act, European corporate governance has also become increasingly regulated with directives and recommendations from the EU Commission, changes in national company law and codes of best practice. Further, Pagano and Volpin (2006) document a general international increase in the level of minority investor protection. Hence, the main question examined in this paper is whether corporate governance regulation has spurred delistings in Europe during the period 1995-2004. We argue that delistings are a good proxy for the cost and benefits of corporate governance regulation.[43]

In the literature different definitions of corporate governance have been proposed. For instance Shleifer and Vishny (1997) argue that two main corporate governance mechanisms are legal investor protection and concentrated ownership. Especially, in

[42] The recent going dark literature in the US has analyzed the impact of the Sarbanes-Oxley act on the decision to deregister (go dark). Marosi and Massoud (2005) find that higher audit costs induced by the Sarbanes-Oxley act have had a significant impact on the decision to delist. Engel et al. (2005) also find a significant effect of the Sarbanes-Oxley act on firms' going private decision, particularly for small firms. Further Kamar et al. (2006) and also Block (2004) find that small firms tend to exit due to the Sarbanes-Oxley act. In contrast, Leuz et al. (2006) find that cost savings alone are unlikely to matter for the decision to delist, but may push more poorly performing firms to go dark. Note, however, that there is a difference between going private and going dark. When a firm goes private it becomes fully private whereas stocks of a firm going dark can still be traded in over-the-counter market.

[43] The listing and cross-listing decision is not entirely comparable to the delisting decision. For instance corporate governance regulation is known ex ante a listing or cross-listing, however, while public new regulation serves as external shocks.

public stock markets with dispersed ownership, investor protection becomes an important corporate governance mechanism.

The influential *Law and Finance* approach championed by La Porta, Lopez-de-Silanes, Shleifer and Vishny (1997, 1998, 1999, 2000a, 2000b) and Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2007) further emphasizes the role of the law in protecting minority investors. The general implication of this approach is that stronger minority investor protection is preferable as it tends to produce larger stock markets, more investments, better allocation of capital and higher economic growth (Beck et al., 2000, 2001, 2003a, 2003b; Beck and Levine, 2004; Djankov et al., 2007). However, complying with the legal rules from investor protection may also spur costs, since it could be that very strong protection of minority investors, such as comprehensive disclosure requirements, strong legal responsibility of non-executive directors, strict limitations on board composition etc. would increase the cost of governance to a point where transaction costs exceed benefits to investors. This could then lead to lower stock prices, fewer initial public offerings (IPOs) and more delistings. It is also possible that the costs and benefits of investor protection regulation differ by country and that some countries are better served with less stringent regulation (cf. Djankov et al., 2003). Along these lines Bruno and Claessens (2007) found that for companies with strong corporate governance practices, excessive country corporate governance regulation can harm firm valuation. They interpreted this as a cost of overregulation. Further, Boot et al. (2006) theoretically emphasizes that corporate governance regulation can lead to overmonitoring of firm management which dampens firm efficiency.

The costs of applying with investor protection regulation include extra auditing costs, disclosure costs, legal assistance, compensation premiums for non-executive and executive directors, board insurance, administration costs, strategic distortion of decision making, and several other items. These costs are difficult to estimate with any degree of precision; however an indirect test examining the effects of corporate governance regulations on delistings could be conducted. The underlying idea of the test is that companies will choose to leave stock exchanges if the governance costs come to exceed the benefits of being listed. Hence, we test whether investor protection

levels affects the decision to delist – especially the going private decision - while controlling for other determinants. In principle, by doing so, we test whether the costs of investor protection regulation exceed the benefits.

Delistings from a stock exchange can take place in different ways. A company may be acquired by another company or merged with it. It may be acquired by new owners (e.g. a private equity fund) and delisted. It may go bankrupt or be liquidated by the incumbent owners. In rare cases it may even be involuntarily delisted by the stock exchange because of failure to comply with the listing standards. These types of delistings are to some extent determined by different causal mechanisms, which we analyze in the following, but there are also some common drivers. For example, as mentioned, higher listing costs ceteris paribus provide an incentive for firms to escape these costs by merger, acquisition or by going private.

Mergers and acquisitions are essential features of corporate governance in countries with well-developed stock markets. A strong market for corporate control may be a competitive advantage for these countries so M&A can to some extent be regarded as a sign of vitality (Pagano and Volpin, 2005a). Going private transactions may be an efficient response to agency problems of free cash flow in large listed firms (Jensen, 1986). Even a high number of bankruptcies can be a positive indicator, i.e. a sign of entrepreneurship or intense competition. So delistings do not constitute a problem per se, although for a stock market to remain strong, these delistings must be balanced by IPOs.

In contrast, going private transactions can be regarded as a sign that the buyers find it more valuable to operate the company as a private entity, i.e. without disclosure, investor meetings, corporate governance regulations and other listing costs, as well as avoiding the costs of separating ownership and control. The buyers may be outsiders, e.g. private equity funds, or insiders (incumbent managers or majority owners), who find it easier to manage their company without having to apply to legal rules of minority investor protection which spur for instance administrative costs. In either case, companies vote with their feet when going private and voluntarily forego the

advantages of being listed. While these transactions may be motivated by other firm specific and macroeconomic factors (which need to be controlled for) we therefore pay special attention to them.

There has in fact been a wave of delistings from European stock exchanges post 2000 which coincides with a number of new governance initiatives, e.g. the spread of codes to continental Europe. In total 30% of the population of listed European firms ceased to be quoted and approximately 40 percent of the asset value vanished in this way over the period 1995-2005.

In this paper, we thus examine delistings in Europe 1995-2005 and to what extent they can be attributed to governance regulation, industry effects and firm specific factors. In the absence of a generally accepted measure of governance regulation we use the La Porta et al. measure of investor protection (revised by Pagano and Volpin, 2005b) as a proxy, but we also experiment with other measures. We do believe that this investor protection measure is a proxy that captures the general trends in governance regulation. Using logistic and multinomial logistic regressions, we find evidence that stronger investor protection increases the likelihood of exit by M&A and going private transactions, but reduces the probability of bankruptcy and liquidation. We also provide instrumental variable estimates of determinants and effects of investor protection regulation while taking into consideration that corporate governance policies may be endogenously determined (Rajan and Zingales, 2003; Pagano and Volpin, 2001, 2005b; Perotti and von Thadden, 2006; Roe, 2006).

2. Theory

According to the *Law and Finance* view corporate governance shapes the attractiveness of public stock markets. In this paper we address the link between the *Law and Finance* view and the decision to delist – in particular how investor protection regulation affects this decision. Investor protection is important since as mentioned, legal protection of minority shareholders is a fundamental part of corporate governance regulation (Shleifer and Vishny, 1997). However, we also discuss firm characteristics as

determinants of delistings. In the following, we will motivate and discuss how the benefits and costs of investor protection regulation are realised, how investor protection regulation affects delistings, and we motivate the use of investor protection regulation as a determinant. Later, we provide more evidence on what shapes investor protection regulation. We focus mainly on going private transactions but will also discuss other potential determinants of going private, M&A and bankruptcy and liquidation which we control for in our empirical analysis.

Firstly, we describe regulatory costs and benefits of being a listed company. A stock exchange creates a market in shares (Mulherin et. al., 1991). The market is attractive to buyers and sellers of shares because it economizes on their transaction costs – that is their search, information, bargaining, decision, policing and enforcement costs (Coase, 1992; Mulherin et al., 1991; Dahlman, 1979). An important instrument in this is a certain standardization of the shares traded (Telser, 1981) which reduces the need for a continuous detailed assessment of individual firms and transforms their stock into "homogenous, fungible securities" (Pirrong, 1995). Standardization and other rules are provided by both law, by the exchanges themselves (Coase, 1992) through listing requirements and corporate governance codes (Cadbury Commission, 1992). This regulation applies to ownership and board structure, corporate governance practice, financial reporting, disclosure, capital structure and firm size, but more subjective criteria like growth (NYSE listing requirements) may also be considered. This regulation is generally prompted by a desire to protect (minority) investors and improve market conditions.

Governance rules and standards are valuable to investors and therefore also to issuers, because they reduce their cost of capital, but they come at a cost. There are direct costs, which include listing fees, fees for auditors and lawyers, liability and insurance costs, larger fees for non-executive and executive directors etc. In the US the costs of compliance with the Sarbanes-Oxley act would fit into this category.[44] Indirect costs

[44] A survey of the 224 largest public firms in the USA by Financial Executives International with regard to the direct costs of complying with Section 404 of the Sarbanes-Oxley act finds that the average first-year estimate is almost $3 million for 26,000 hours of internal work and 5,000 hours of external work, plus additional audit fees of $823,200, or an increase of 53% (Zhang, 2005).

would include costs of disclosure to competitors, loss of flexibility with regard to board structure, opportunity costs of top management time, box-checking and bureaucratic procedures. We hypothesize that the likelihood of delisting will depend on both costs and benefits of investor protection regulation. The rationale for this is that the probability of delisting will depend on transaction costs, particularly whether the fixed cost of being listed exceed the benefits of relatively low marginal trading costs.

Firms can avoid fixed listing costs by going private, but at the cost of higher variable cost of trading shares outside the organized market. We believe that going private transactions are essential to evaluate when determining the costs and benefits of investor protection regulation. Alternatively, firms can save on listing costs by merging with other listed companies, but in the absence of synergies the savings may be drowned by higher administration costs in a larger company (Williamson, 1995, 2005). Finally, firms can choose to delist in order to list on another stock exchange (Focault and Parleur, 2004).

It is difficult to determine the optimal level of regulation with any degree of precision because regulation is so multifaceted. The widely used investor protection (level) index originally proposed by La Porta et al. (1998) was justified to a large extent by a positive effect on the size of the stock market. More generally, however, this so-called anti-director rights index summarized measures which were believed to strengthen the rights of minority investors vis-à-vis company boards. But for instance the right to file lawsuits against boards involves costs, so does the right to call an annual meeting and the proxy by mail system probably also introduces administrative costs.

As another example La Porta et al. consider that investors are better protected where an investor can call an extraordinary general meeting, if she has more than 10% of the stock. It is clear that extraordinary meeting involves costs not just for the managers who have to defend their decisions, but also for the other shareholders who have to attend the meeting or live with the outcome if they stay away. But what if this threshold was lowered to 5% - would investor protection then be higher? If so how about 1%? Or should any shareholder be able to call a shareholder meeting any time? In most

situations the transaction costs for both the shareholder and the company would probably become to high at some point, and the other shareholders would consider delisting or at least the company's market value would drop. In contrast few would argue with the proposition that a qualified majority of the shareholders should be able to call an extraordinary meeting.

The study by Bruno and Claessens (2007) examines how company corporate governance practices and country regulatory regimes affect firm valuation. Similar to our approach the authors argue that country level overregulation can be present. Their argument is mainly backed by two theoretical explanations that also apply here. Firstly, Burkart et al. (1997) argue that too much monitoring and legal protection may dampen managerial initiatives and consequently worsen firm efficiency. Secondly, Boot et al. (2006) find that corporate governance controls can prevent management from doing what it should. Bruno and Claessens' empirically findings suggest that for firms with strong corporate governance practices, country level corporate governance regulation may have a negative impact on firm valuation. This could hence be interpreted as a sign of overregulation.

We therefore conjecture that there is a cost of investor protection regulation as well as a benefit, that more regulation is not necessarily better. This is also recognized by the political economy view and these political determinants are discussed next. Whether a given investor protection regulation measure will have a positive or negative effect on stock market attractiveness is essentially an empirical question, which we will try to address in the following by focusing on delistings.

2.1. Political determinants of delisting

Until recently, research in international corporate governance emphasized that national corporate governance systems are stable and historically determined by legal origin (La Porta et al., 1998), cultural and ideological differences between countries (Roe, 2003) or demography (Alesina and Glaeser, 2004). However, recent research on the politics of governance has emphasized that corporate governance policies actually do change over

time and sometimes in ways which impede rather than facilitate large stock markets (Pagano and Volpin, 2001, 2005a, 2005b; Rajan and Zingales, 2003; Perotti and von Thadden, 2006; Roe, 2006). Over the last decade European corporate governance has arguably changed as a result of changes in company law (e.g. the EU takeover directive) and the diffusion of corporate governance codes (Pagano and Volpin, 2006). Moreover, structural changes such as the common European currency have facilitated the internationalization of European stock markets (e.g. Stultz, 2005) in a way which may be helpful in revealing the effect of underlying differences in national governance policies.

This raises the question whether corporate governance policies have the desired effects. In principle, well-intended regulation by benevolent policymakers may increase investor protection, lower discount rates, raise stock prices and market values and thereby make it more attractive to list or stay listed and less attractive to delist. However regulation may also impair stock market development (Rajan and Zingales, 2003), which recent research has tried to explain by interest group politics and the way politics is shaped by constitutions (Pagano and Volpin, 2001, 2005b; Perotti and von Thadden, 2006). Interest group politics will only rarely lead to socially optimal regulation (Olson, 2000). Djankov et al. (2003) recognize that politics may lead to socially wasteful regulation, for example ascendant interest groups may choose institutions that protect their political and economic rents. They highlight how uncritical transfer of institutions – such as colonial transplants – may lead to inefficient regulation.[45] "Politics has a bad name in economics", they note, but maintain that policies are often welfare-enhance despite the general scepticism.

The political economy view of governance invites questions concerning the effects of corporate governance regulation across shareholder and stakeholder groups. In particular, corporate governance regulation arguably influences the balance of power between minority shareholders and controlling owners (Stultz, 2005). Strong protection

[45] While the idea of colonial transplants is not directly applicable to recent changes in corporate governance regulation, the remarkable spread of quite uniform regulation (codes of best practice, EU directives, increases in investor protection measures) to countries with quite different corporate governance systems does nourish a suspicion that not all of this regulation is efficiently adapted to the local context. It is not clear whether for example smaller countries can improve their stock markets simply by adopting Anglo-American standards.

of minority investors may reduce the control premia and private benefits of dominant owners. In this paper our main focus is on investor protection regulation. However, we do make a distinction between two types of regulation: 1) minority investor protection, which influences the distribution of rents and benefits between controlling shareholders (insiders) and minority investors (outsiders), and 2) general legal infrastructure (e.g. protection of property rights, efficiency of the courts), which we measure by the World Bank governance indices. The general legal infrastructure may capture a more structural dimension of a country's legal system which may also affect the attractiveness of public stock markets. Especially this effect might be present in emerging markets.

We distinguish between two different hypotheses concerning the costs and benefits of investor protection regulation on European delistings in this period. According to the efficiency hypothesis (benefits of investor protection regulation outweighs the costs) new regulation is enacted to improve the functioning of stock markets and is therefore likely to have a positive effect on company performance and stock prices, which will strengthen the incentives to list and remain listed. On the contrary, according to the overregulation hypothesis (costs outweighs the benefits), regulation is a result of rent seeking by powerful economic constituencies, which seek to further their own interests, for example in the last decade institutional investors and their service providers (investment banks, auditing firms). If the costs of new regulation to protect minority investors exceed the benefits in terms of lower costs of capital, companies will tend to leave the exchange.

In the case of going private transactions, incumbent controlling shareholders may decide that the listing benefits are too small and buy out minority investors. This will be especially likely if there are private benefits of control which the incumbent owners can retain by delisting. Alternatively, private equity buyout funds may find that they can create value by taking over listed companies because they can cut down on information costs and have greater flexibility with regard to board structure, compensation systems, capital structure and the like.

Companies may also choose to economize on governance costs by merging with other listed companies, or they may gain the same benefits as going private if they are taken over by a privately held company. Moreover, lower private benefits of control as a consequence of higher governance standards may make it more attractive for incumbent owners to sell out: the private benefits of control are lower and minority investors are willing to pay a higher price for the same reason (La Porta et al., 2000a, 2002). Rossi and Volpin (2004) and Pagano and Volpin (2006) find that minority investor protection is associated with more mergers and acquisitions.

Finally, bankruptcy/liquidation is arguably less likely in countries with high corporate governance standards where well-performing firms are less likely to be capital- and cash-rationed, while bad performance is presumably more likely to be detected and corrected before the firm fails. In particular, higher transparency should make it easier for banks and other lenders to avoid bad loans. We recognize that the absolute number of bankruptcies may well be higher in countries with higher investor protection, but our hypothesis concerns frequencies.

Investor protection regulation is, however, not the only determinant of delistings. In the following we describe other potential determinants of going private, M&A and bankruptcy and liquidation which we attempt to control for in our empirical analysis.

2.2. Determinants of going private transactions

Jensen (1986, 1989) proposed that going private transactions (leverage buyouts) can be regarded as an efficient response to agency problems in publicly listed companies. For example, private equity funds can target companies which – for whatever reason – deviate substantially from shareholder value maximization. This type of transaction could be directed at companies with weak owners (low ownership concentration) that suffer from owner-manager agency problems which going private transactions address (Jensen, 1986). For example, companies with high equity to assets ratios could benefit from financial leverage. Inefficiency – and scope for value creation by restructuring - could be found among companies that have many employees or low rates of asset

turnover compared to industry benchmarks. Going private may be a particularly appropriate solution to agency problems in companies with substantial free cash flow (Jensen, 1986) which is not paid out as dividends. Jensen also emphasized that industries with stable free cash flows are particularly suited for financial leverage.
Not all going private transactions involve leveraged buy-outs, however, such agency costs savings may also apply to other acquirers.

In addition, stock liquidity may be an important driver of delistings as emphasized by Bharath and Dittmar (2006). If a stock is not liquid (easily tradeable), it may be priced at a discount, which implies lower advantages of being listed. This could imply that companies with more concentrated ownership (less free float), less traded stocks and operating in less liquid national stock markets will be more inclined to go private.

Another line of research maintains that the shareholder gains from going private transactions arise from a zero sum game with incumbent stakeholders whose wealth is being expropriated (e.g. Shleifer and Summers, 1988). This could mean that companies with high debt-to-equity ratios are more likely to go private because a substantial part of the cost is paid by increasing risk among incumbent debtholders (e.g. Marais, Schipper and Smith, 1989, for the case of bondholders). The incumbent shareholders may also be expropriated by the incumbent management (Lowenstein, 1985; Harlow and Howe, 1993) or controlling owners: Low dividends and low reported earnings per share could signal that managers or controlling owners try to depress prices prior to delisting. Taxation benefits can be a cause of delistings (Kaplan, 1989) if buyouts involve substituting debt for equity which many private equity funds presumably do. The value of the tax shield should be a function of tax and interest rates, and changes in the tax shield would be expected to influence the decision to delist.

Finally, going private can be influenced by stock prices (e.g. under/overvaluation of a company's shares relative to fundamentals). High stock prices relative to fundamentals or prospects mean that it is relatively less attractive to take over a company. According to the undervaluation hypothesis high stock prices and by implication high firm value (q) should therefore be associated with a lower propensity to go private (Palepu, 1986).

We also note that correctly highly valued companies have better growth prospects and may therefore find it profitable to remain listed to finance further expansion. Moreover, we conjecture that market timing – e.g. perceived high or low stock prices in general - seems to be an element in the decision to delist similarly to what Baker and Wurgler (2002) and others found for the IPO decision. To potential private buyers it may seem more attractive to take a company private if stock prices are low.

2.3. Determinants of M&A

The extensive literature on M&A identifies several determinants of delistings by acquisition or merger (Dietrich and Sorensen, 1984; Palepu, 1986; Cudd and Duggal, 2000). Firm size could have a negative effect on the likelihood of becoming a target for merger or acquisition, if it is easier to finance small transactions and if acquisition costs are smaller for small firms (Dietrich and Sorensen, 1984). However, fixed transaction costs of acquisition imply that unit costs are lower when large firms are acquired. In fact the merger activities in the 1980s compared to those of other periods were mainly characterized by the large size of targets (Barnes, 2000). Managerial inefficiency could show up in bad company performance making the firm a more likely target for acquisition because of liquidity problems or dissatisfaction among the incumbent owners (Jensen, 1986; Palepu, 1986). The new owner could replace inefficient management and increase earnings in the long run. If agency problems are more severe in large firms (Nuttal, 1999), this would make it more attractive to take over large firms, particularly those with agency problems because of low ownership concentration. Financial Leverage is important according to the failing firms' hypothesis which regards merger or acquisition as a civilized alternative to bankruptcy (Dewey, 1961). Leverage (loss of equity dues to past bad performance) may also signal inefficient management. Nuttal (1999) finds that avoiding bankruptcy or financial distress is an important motive to sell. Industry shocks (like deregulation or new technology) can necessitate horizontal mergers to restructure an industry. Andrade, Mitchell and Stafford (2001) and Mitchell and Mulherin (1996) find that merger activity in 1990s in the U.S. was clustered by industry. Undervaluation (low Market-to-Book or Price-Earnings ratio) implies that targets are less expensive and so more attractive to buy

(Dietrich and Sorensen, 1984; Palepu, 1986; Cudd and Duggal, 2000; Shleifer and Vishny, 2003; Rhodes-Kropf and Viswanathan, 2004).

2.4. Determinants of Bankruptcy and liquidation

Both bankruptcy and liquidation may involve large losses to creditors and shareholders, but may also involve more orderly dissolution of the company without losses to creditors or reorganization and continuation of the business in some form (White, 1989). In our data we find that companies perform better prior to liquidation than prior to bankruptcy in terms of accounting profitability and market valuation, but we group them in one category because they influence delisting frequencies relatively little. Insolvency could imply that a company cannot repay its debt due to a lack of liquidity (Altman, 1968, 1993; Schary, 1991; Bechetti and Sierra, 2003; Hillegeist et al., 2004; Buehler et al., 2006). This may or may not ultimately lead to bankruptcy. Accounting ratios for profitability, liquidity and solvency have been proposed as useful measures for predicting whether firms are likely to default or go bankrupt (Altman, 1993): Net working capital to total assets (liquidity), equity to total liabilities (solvency) and asset turnover, i.e. sales to assets, (to measure efficiency of management). Like acquisition by a private equity fund or another firm bankruptcies may also be the result of managerial inefficiency.

3. The data

3.1. Data sources

Our dataset (from Thomson Financial and Worldscope) consists of all listed European companies over the period 1995-2005, including both companies that are listed in any given year and companies that are not, but were listed at some point during the period. We do not have full coverage, for example we miss data from countries like Iceland,

Switzerland, Russia and other members of the former Soviet Union, but we do have a fairly comprehensive sample.[46]

Since we would like to analyze changes in the population and their determinants we loose one year (1995). To ensure completeness of the dataset we also drop 2005 from the sample to avoid registering a delisted company as listed because it reports late in the year. The observation period 1996-2004 both contains bull and bear years, e.g. the stock market bubble of the 1990s, the decline 2000-2003 and the partial recovery in 2004-2005. In terms of corporate governance the period is characterized by rapid growth in government regulation, EU directives, new national laws and best practices codes, most of which started in the UK and spread subsequently to the rest of Europe. It can perhaps be characterized as the heyday of corporate governance and provides an excellent period for studying the effects of these new initiatives.

Based on the information from Thomson Financial/Worldscope we can distinguish between five types of delisting - merger, acquisition, bankruptcy, liquidation or going private. We classify the cause of delisting as merger if a firm is delisted because of merger with another firm. A firm is denoted as acquired if it is taken over by another firm. In M&A it is the target firms which become delisted. Going private firms are categorized as such if they are taken over and delisted by a private non-corporate buyer, for instance an individual or a private equity fund. Finally, we have direct information on whether a firm delists due to bankruptcy or liquidation. This key firm status variable published by Thomson Financial is based on their own research on company filings, press releases and other news available. A potential problem with this classification is overlap between groups due to misspecifications. For example it may be difficult to distinguish between an acquisition and a going private transaction in private equity buyouts where private equity funds set up a holding company (controlled by the fund) which buys the target firm. We checked for this and other measurement problems where we have good secondary information and found only two misspecifications in which going private firms were grouped as acquired. In the present study we combine the 5 different types of

[46] The data consists of information from the following 21 countries: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden and United Kingdom.

delisting into 3 groups: merger and acquisition, going private and bankruptcy/liquidation. We do not have access to detailed information about buyers and so we cannot distinguish between private equity funds and incumbent blockholders in going private transactions or between foreign and domestic acquirers in M&A transactions.

Data on UK includes Alternative Investment Market (AIM) listings. AIM was launched in 1995 and AIM has been growing in terms of new listings since then. The AIM is regulatory flexible compared to the main London market. This could bias our analysis, however, AIM companies are encouraged to follow same corporate governance codes as companies listed on the main market are required to follow. The AIM actually seem to resemble the general patterns of other stock exchanges since about 30% of firms that had become listed during 1995-2005 became delisted (LSE, 2005), hence, indicating that including AIM companies does not seem to bias our results.

We only have information on where the primary issue trades. However, several firms do choose to cross-list and this could introduce a bias in data since we can not control for this. For instance, it is problematic when European firms cross-list in New York since they will have to apply to US corporate governance requirements etc. However, our scope is also different since we examine the decision to delist and not the decision to cross-list, or the IPO decision – and the determinants of these may differ greatly. We argue that examining delistings capture a more direct effect of the costs and benefits of corporate governance regulation. Moreover, firms that contemplate to go public can take current regulation into account, whereas listed firms need to adjust to the regulation. Which might explain the diverging impact of Sarbanes Oxley on cross-listings and delistings (e.g. Engel et al., 2005; Marosi and Massoud, 2005; Kamar et al., 2006; Doidge et al., 2007).

We have yearly observations of the standard accounting and market variables, for example company size in terms of assets or turnover, market value, return on assets (ROA), debt, cash flow, sales growth, ownership concentration, main industry[47], country of origin etc. as well as the nature of the delisting (merger, acquisition, going

[47] The Standard Industrial Classification (SIC) codes.

private transaction, liquidation or bankruptcy). We correct for extreme observations by truncation (e.g. ROA < -100% is registered as ROA = -100%). By country of incorporation we link to country information on the LSSV investor protection index (updated by Pagano and Volpin, 2005b), and World Bank governance ratings, for which we have time series information. We can also link to structural variables like legal origin, self-dealing indices etc. Moreover, we link to GDP growth (OECD) and the aggregate volume of private equity investments (Deloitte, 2005).

We calculate a simplified proxy for the q ratio which is the ratio between market value plus book value of debt relatively to the book value of total assets as a proxy for the replacement value of the assets. Perfect and Wiles (1994) discuss that simple Tobin's q measures are probably to simplifying, however, the measure used here is applied in related studies (e.g. Doidge et al., 2007). The firm-specific q is measured by using annual data on market value and book values of debt and assets. Average firm value is the annual country averages equally weighted of the firm-specific q defined above.

We study the impact of alternative measures of governance regulation on delistings. One important and widely used measure is the investor protection index constructed by La Porta et al. (1998) and updated by Pagano and Volpin (2005b) to vary by country and year.[48] This measure is a sum of six dummy variables: 1) whether or not proxy by mail is allowed, 2) if shares are not blocked before a shareholder meeting or whether they are, 3) whether or not cumulative voting for directors is allowed, 4) whether or not oppressed minorities are protected, 5) whether the percentage of share capital required to call an extraordinary shareholder meeting is less than 10 percent, and 6) whether or not existing shareholders have pre-emptive rights at new equity offerings. We abbreviate this variable the LSSVPV investor protection index. Pagano and Volpin extend and revise the La Porta et al. survey from 1993. Based on a new survey questionnaire they are able to evaluate the interval from 1993 to 2002. In their questionnaire they ask how the regulation today (2002) is different from the previous La Porta et al. measure, and when and how the law changed. Hence, this index not only corrects some of the misspecifications of the previous index it also adds time-variation to the index. Investor protection has increased over the observation period, but there are

[48] The Pagano and Volpin (2005b) dataset is available at http://www.e-aer.org/data/sept05_data_pagano.zip.

still substantial country differences. We lack information after 2002 and therefore assume no changes in 2003 (since we predict delistings one year ahead up to 2004 we do not need the 2004 figures).

There is a great debate about these measures being incomplete, mainly because of the indices ad hoc nature and for several conceptual ambiguities and outright mistakes in coding. However, as raised Pagano and Volpin (2005b) addresses these issues when revising the index. Another argument for using their revised index is that Pagano and Volpin introduces the time dimension in their measure – the investor protection index varies over time which is not the case for La Porta et al.'s index. This is relevant for our analysis since we investigate how the development in investor protection regulation has changed the delisting decision. Secondly, the revised index by Pagano and Volpin is highly correlated with other measures such as the revised anti-director index and the anti self-dealing index (about 0.75). This also suggests that the revised Pagano and Volpin measure is applicable in our analysis.

We regard the LSSVPV investor protection index as a proxy for minority investor protection in general including disclosure requirements, accounting standards and insider trading rules, which we believe to be correlated with the index.[49] We do not mean to imply that introducing mandatory cumulative voting or proxy by mail will have much of a direct effect on delistings or other economic variables. However, the LSSVPV index is correlated with other kinds of minority investor protection, for example the Djankov et al. (2007) anti self-dealing index, our measure of code adoption or a measure of regulatory costs (Jackson, 2005) and can therefore be used as a proxy for more general trends in governance regulation. Among the important changes during this period we can mention EU directives on transparency (2004), prospectus (2003), transparency, market abuse (2003), takeovers (2004), financial instruments (2004), which have to a large extent been implemented in the national law of EU member

[49] Other related indices regarding securities laws such as disclosure requirements and liability standards (see La Porta et al., 2006) could also be used but they are also not time-varying. They also show to be strongly correlated (not reported) with our used measure of investor protection regulation (0.5-0.8).

countries and associated countries during our study period (Thuesen, 2007).[50] For example, the takeover directive enforces a mandatory bid rule (in control block trades all shareholders must get the same offer), which makes it difficult to undertake control block transactions without delisting companies. The disclosure directive obligates companies to disclose stock transactions for managers and large owners and to quickly disclose relevant inside information to all shareholders. This could reduce the private benefits of control for large owners. The prospectus directive implies an uncertain increase in the legal liability of board member for risk management and internal control. This new regulation applies only to listed companies, none of it applies to private equity funds and privately owned companies.

As a measure of general legal infrastructure the World Bank governance index is used. The index combines measures of political freedom (e.g. freedom of speech, association, voting), regulatory quality (e.g. costs of regulation, efficient enforcement, presence of generally accepted codes company law) and quality of the legal system (e.g. quality of contract enforcement and court system). Every second year since 1996 the World Bank has published a set of six different country level governance indicators for 209 countries; see Kaufman et al. (2005, 2006). The six governance indicators are: i) Voice and accountability, ii) Political instability and violence, iii) Government effectiveness, iv) Regulatory quality, v) Rule of law, and vi) Control of corruption. The governance indicators are constructed through 37 different data sources with more than 300 different underlying variables. More specifically, the main data sources cover information gathered from surveys of firms' and individuals' perception of governance, as well as assessments by commercial risk rating agencies. Basically, the advantage of this approach is that the World Bank governance indicators are more informative about unobserved governance characteristics than other comparable data sources. These governance indicators are measured in units ranging from -2.5 to 2.5, where higher values correspond to better governance. Since our focus is Europe we decide only to use the governance indicators which we find most important for our sample of (developed) countries. Thus we define a new World Bank governance indicator which

[50] EU Directive on the market for financial instruments (2004/39/21. April 2004), EU Directive on prospectus (2003/71/4. November 2003), EU Directive on Market Abuse (2003/6/28. January 2003), EU directive on Transparency (2004/109/15. December 2004), EU directive on Takeovers (2004/25/21. April 2004).

is the sum of three indicators: voice and accountability, regulatory quality, and rule of law, i.e. our measure ranges from -7.5 to 7.5. We assume unchanged index values for years with no index values reported (1997, 1999 and 2001).

To examine the effect of informal corporate governance codes which have been an important element of corporate governance regulation we construct a code adoption variable based on information from the European Corporate Governance Network website. We use a simple binary variable (code adoption = 1 if a country has a corporate governance code in a given year and 0 otherwise). Hence, for example if a country introduces its first corporate governance code in 1999 then the code adoption variable is 0 until 1999 and 1 onwards. This measure is intended to measure the effect of corporate governance codes on delistings. A generally accepted aim for these codes is to improve investor confidence, which could increase incentives to remain listed (Cadbury Commission, 1992). But governance codes have also been criticized for leading to senseless box checking and for arbitrary restrictions on board membership, board organization etc. (Hermalin and Weisbach, 2005).

As we will argue later there is reason to believe that the World Bank governance and the LSSVPV indices measure different dimensions of corporate governance regulation. Whereas the World Bank is concerned with the overall quality of social institutions, the LSSVPV index more specifically measures minority investor protection. The two measures are not strongly correlated.

3.2. Descriptive Statistics

The first major finding in this data set is the magnitude of the changes. We register a total of 12612 companies listed at European exchanges during the period, of which an astounding 30 percent have been delisted. In market values this corresponds to approximately $3.7 trillion or 40 percent of total market value. Obviously firm dynamics are very important, and the studies which abstract from them by balanced panels or cross sections miss an important part of economic reality.

For an overview we begin with a few graphs. Figure 1 shows the number of listed firms, delistings and IPOs over the period 1996-2004. We observe a steady growth in the number of listed firms up to the year 2001, reflecting more listings than IPOs, a drop in 2002-2003 because of fewer newlists and more delistings with a pick up in numbers in 2004. The trend follows market trends (average firm value) with a lag: The number of listed firms increases when stock prices (and firm value) increase and decrease when stock prices decrease.

Figure 1: Listed firms, IPOs, Delistings, and average firm value

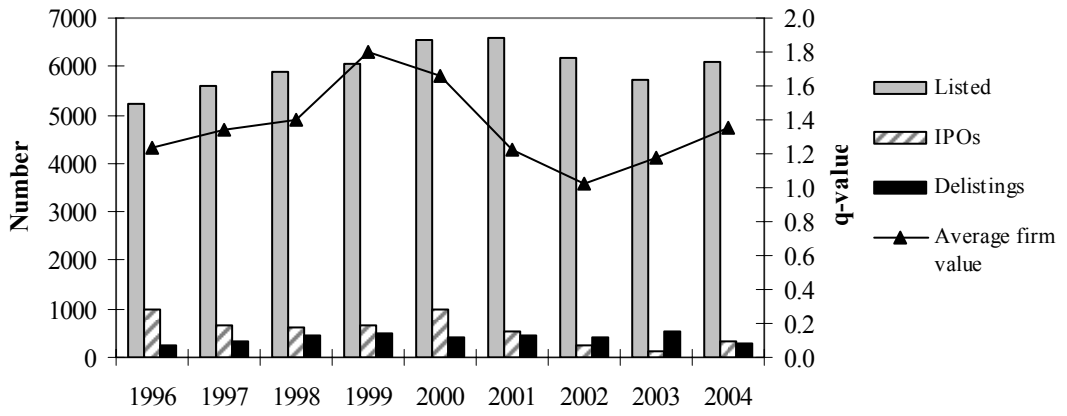


Figure 2: Delisting-frequencies by country

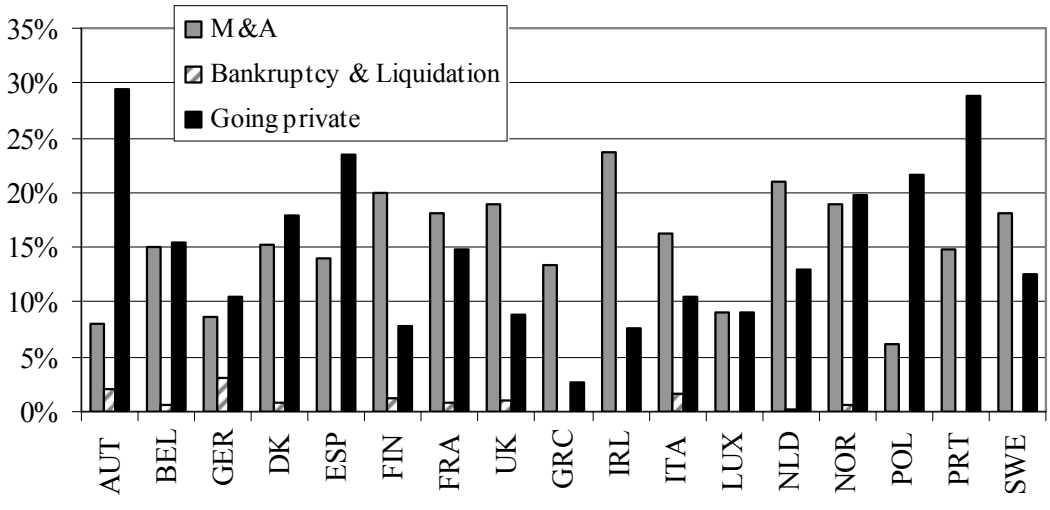
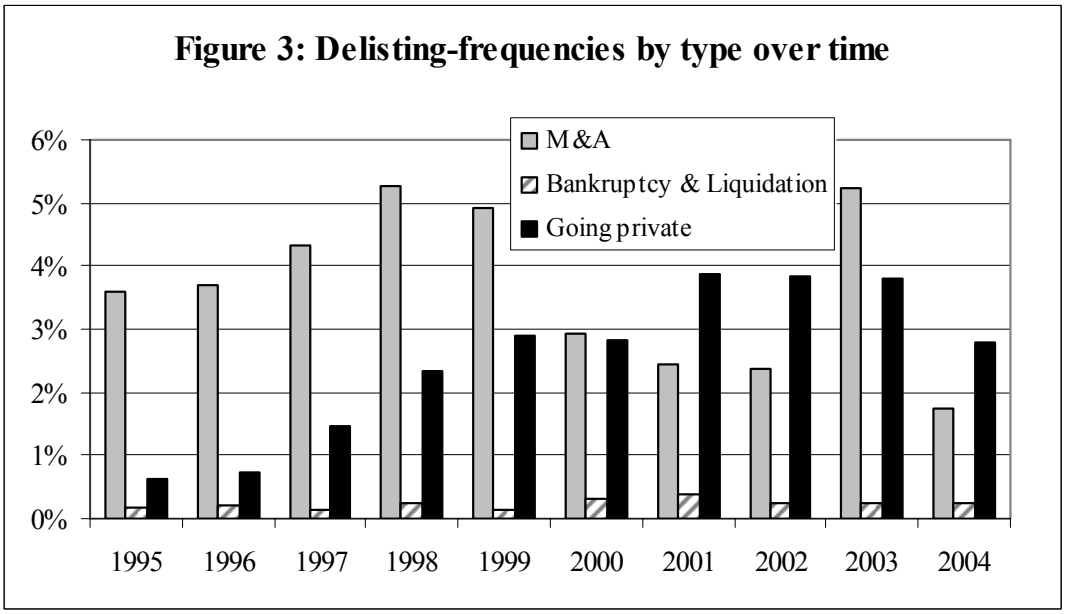


Figure 2 shows the incidence of delistings by countries. We observe a high incidence of M&A in the UK, Finland, and the Netherlands, which are on the top 5 in Europe measured by the LSSVPV investor protection index or by the World Bank governance index. In contrast, we observe particularly high going private frequencies in Austria and Portugal. These countries tend to be mid-level in terms of investor protection (La Porta et al., 1998), but both countries experienced an increase in minority protection in 1999-2000 (Pagano and Volpin, 2005b) prior to a massive increase in going private transactions. Johnson (2003, p. 36) describes how "Many Austrian managers clearly feel the attention a company receives from Austrian investors doesn't merit the growing burdens of maintaining a listing".

Finally, figure 3 tracks the evolution of delistings by type over time. We note a wave of M&A during the bull market up to 2000, after which the number of transactions dropped in the bear market, but picked up again in 2003. In contrast, there is a strong increase in the frequency of going private transactions over time, although with a drop in 2004. The frequency of bankruptcies and liquidations peaked when the bull market burst in 2000-2001, but stayed at a low level during the whole period.

Figure 3: Delisting-frequencies by type over time



From table 1, which shows descriptive statistics by type of delisting, we observe that going private transactions tend to be preceded by significantly higher rates of

ownership concentration, 56%, against 44% on average for firms that continue as listed. One explanation could be that low stock liquidity makes it less attractive for firms with concentrated ownership to remain listed. Alternatively, it may be easier for insiders to take a company private if they already have substantial ownership. A typical scenario seems to be that insiders (e.g. a founding family) list their company by selling a minority stake to the public, but later for different reasons (low market valuation, financial problems) decide to go private again. Bankruptcy candidates tend to have lower ownership concentration, which is consistent with less risk aversion for more dispersed ownership. We define ownership concentration as the ratio between closely-held shares and common shares where closely-held shares represents shares held by insiders.

In terms of size (log accounting assets), M&A targets are typically larger than firms that continue to be listed which is a surprise since size has historically been regarded as a takeover deterrent. In contrast firms that go private are typically smaller than the firms that remain listed. And the subsequently bankrupted or liquidated firms are even smaller. It may be easier for insiders or equity funds to finance the acquisition of smaller firms which may also benefit less from remaining listed.

In terms of capital structure, firms going private or bankrupt have lower equity-to-assets ratios than firms that continue as listed. This is more consistent with expropriation of existing debtors than with efficiency gains of post transaction leveraging. The average equity ratio for merged and acquired firms is closer to the average for listed firms. Firms that subsequently go into liquidation or bankruptcy tend to have particularly low equity ratios as might be expected.

Growth rates (sales growth) tend to be highest among the firms which continue to be listed, slightly lower for M&A firms and lowest for firms that go private. It seems understandable that high growth firms would want to remain listed to finance their expansion more easily. In contrast low-growth firms will benefit less from being listed. Within the bankruptcy and liquidation group there is a big difference between

bankrupted firms which have high prior growth rates and liquidated firms which have zero growth rates, but the number of observations is small for both groups.

Accounting profitability tends to be higher among merged and acquired firms than among firms that remain listed, but lower for firms going private. In other words, the failing firms hypothesis (Dewey, 1961) is more convincing for going private transactions than for M&A. Following Jensen (1986) it may be easier to restructure companies which are privately held. Surprisingly, firms going private tend to have negative ROA[51] on average, while negative ROA is expected for bankrupted and liquidated firms. Apparently firms that go private tend to be low performers. Later in the paper we check for differences between profitable and unprofitable firms. Alternatively, accounting profitability may be manipulated by insiders to make companies cheaper which would then indicate expropriation of minority investors. Sales per employee is, however, higher for both M&A and going private transactions compared to remaining listed firms and the overall average.

Firm value, q,[52] is higher for firms that remain listed, which makes sense, since they are more expensive to buy or have better growth prospects, but the differences between delisted firms are small.

Being newly listed (IPO within the period 1996-2004) makes the firm a less likely M&A target, but a more likely target for going private or for bankruptcy/liquidation. 54-55% of the firms that subsequently went private or bankrupt were listed during the period whereas the percentage for firms remaining listed was 40% and 30% for merged/acquired firms.

In addition to the firm specific variables we include a number of country variables to capture the impact of country differences. We use average firm value by country and year[53] as a measure of general market sentiment/expectations (Shleifer and Vishny,

[51] ROA is defined as netincome before preferred dividends plus interest expense on debt-interest capitalized after taxes relatively to last year's total assets.
[52] Firm value, q, is defined as the sum of market value and debt book value to book value of total assets.
[53] Average firm value is therefore the annual country averages of the firm-specific q-values.

2003; Rhodes-Kropf and Viswanathan, 2004). The decision to delist may for example be influenced by the value of the company relative to other listed firms. Average firm value does not vary much between exiting firms and firms that remain listed or by type of delisting. But it is slightly lower for going private firms compared to M&A firms. Perhaps a positive market sentiment (high average q) induces more M&A because acquiring companies have lower costs of capital or believe to have better growth prospects, while high average q leads to fewer going private transactions because it seems more expensive to buy listed companies in good times.

We use average market liquidity as an indicator of trends in liquidity, since there the firm level information is relatively scarce. It is measured as yearly country averages of the ratio between common shares traded and common shares outstanding. Stock market liquidity tends to be high for merged or acquired companies, but low for firms going private or bankrupt, if we compare to firms that remain listed. Apparently, low stock market liquidity is an incentive to delist (Bharath and Dittmar, 2006).

We also include aggregate measures of M&A activity (annual country M&A frequencies) and private equity investment (Deloitte, 2005) to be able to control for macro-trends which happen by chance to be correlated with corporate governance policies. For example it is well known that M&A tend to come in waves which appear to be serially correlated, but difficult to explain by standard economic variables (Harford, 2005). We find that merged or acquired companies are preceded by a high incidence of previous M&A, but going private transactions appear not to be preceded by a higher going private frequency. Since the surge of private equity investment are said to be partially motivated by a wish to get around governance costs in listed companies, this involves some risk of overcontrolling, but out results remain the same if we leave this variable out. We also see few differences between M&A and going private transactions related to the development of GDP.

As for the governance policy variables, M&A tends to occur in countries and time periods with slightly better investor protection and slightly better overall governance. Investor protection is also slightly higher in companies that later go private. Previous

increases in investor protection appear to be smaller among firms that subsequently delist, particularly among those delisting by bankruptcy/liquidation and M&A.

Summing up, companies being delisted by merger or acquisition are attractive in the sense that they tend to be larger, have higher accounting returns and growth rates than firms that remain listed. In contrast, the firms going private or into bankruptcy/liquidation are relatively unattractive measured on the same variables.

Table 2 presents the correlation matrix. For overall delistings we observe many significant, but small correlations with our explanatory variables. Delisted firms are slightly larger, have more concentrated ownership and higher sales per employee, but do worse in terms of equity-to-assets ratio, sales growth, return on assets, cash flow and firm value. The correlation analysis tends to confirm the impression that M&A targets are attractive, while firms going private are poor performers. Firms that are subsequently acquired or merged tend to be larger, have more concentrated ownership, be more profitable, be lower valued, to have been listed for longer, and to be listed in countries with better overall corporate governance (according to the World Bank index), but to grow slower than other firms. Firms that later go private tend to be smaller, have more concentrated ownership, to underperform in terms of sales growth, firm value and accounting profitability, and to be located in countries with better investor protection, but a poorer World Bank governance score. Firms that subsequently enter into bankruptcy or liquidation tend to be small and to have less equity. The correlations between explanatory variables are low so multicollinearity is not an important problem.

In previous analysis we found that the cash flow to sales ratio (a possible measure of free cash flow) was highly correlated with return on assets and decided to leave it out. We also experimented with a number of other firm specific variables (e.g. asset turnover, dividends) and national institutional variables (e.g. corporate tax rates, interest rates, the Djankov et al. (2007) anti self-dealing index), which turned out not to have significant effects or to be highly correlated with other explanatory variables. We therefore omitted them in subsequent analysis.

Table 1
Descriptive statistics

Variable explanations: Ownership concentration is defined as the ratio between closely-held shares and common shares outstanding. Closely-held shares represents shares held by insiders. Firm value, q, is defined as market value plus total debt to total assets. Average firm value is annual country averages based upon the firm-specific q's. The total private equity investment ratio is the ratio between total private equity investments and stock market value by year and country. Information on private equity investments is gathered from Deloitte (2005). Stock liquidity is measured as country averages (per year) of common shares traded relatively to common shares outstanding. The M&A frequency is the annual country averages. Newlist is a dummy variable which assigns a firm with the value one if the firm has become listed after 1995 otherwise zero. Growth in GDP is from OECD.

The World Bank governance variable is defined as the sum of three indicators: voice and accountability, regulatory quality, and rule of law. The LSSV Pagano-Volpin investor protection index (Pagano and Volpin, 2005b) is the updated investor protection index by La Porta et al. (1998). Code adoption is a dummy variable with the value of one (and onwards) when a country's first corporate governance code is adopted.

Number of observations and standard deviations are reported in brackets.

	Overall average	*Remaining Listed*	*M&A*	*Going private*	*Bankruptcy & Liquidation*
Ownership concentration, %	44.9	44.3	46.1	55.8	39.9
	[40511]	[36446]	[1571]	[853]	[86]
	[28.1]	[27.5]	[29.1]	[30.5]	[26.5]
Log of assets	5.153	5.114	5.698	4.553	4.229
	[64880]	[53477]	[1978]	[1324]	[125]
	[2.421]	[2.366]	[2.214]	[1.950]	[1.633]
Sales/employee, per million $	0.519	0.491	0.690	1.062	0.186
	[54617]	[47683]	[1828]	[1098]	[80]
	[4.252]	[3.763]	[7.174]	[13.021]	[0.205]
Equity to assets, %	39.2	40.6	38.6	30.1	27.5
	[61981]	[53437]	[1977]	[1324]	[125]
	[36.4]	[35.4]	[33.3]	[48.4]	[60.0]
One-year growth in sales, %	12.7	13.3	8.7	5.9	7.4
	[56949]	[49814]	[1937]	[1271]	[123]
	[34.2]	[34.5]	[31.0]	[38.6]	[44.3]
Return on assets, %	2.1	2.2	3.5	-3.9	-10.1
	[56690]	[49631]	[1935]	[1269]	[124]
	[23.7]	[23.9]	[16.9]	[25.5]	[26.4]
Firm value, q	1.334	1.354	1.106	1.107	1.238
	[55320]	[50665]	[1961]	[1312]	[125]
	[1.498]	[1.526]	[1.083]	[1.276]	[1.773]
Average firm value	1.343	1.340	1.408	1.271	1.304
	[65454]	[53798]	[1979]	[1326]	[125]
	[0.401]	[0.415]	[0.404]	[0.369]	[0.336]
Total Private Equity investments relative to market value, %	0.633	0.629	0.644	0.639	0.667
	[65080]	[50071]	[1914]	[1235]	[121]
	[0.381]	[0.388]	[0.335]	[0.399]	[0.261]
Stock liquidity	0.289	0.286	0.309	0.248	0.230
	[61441]	[50385]	[1918]	[1235]	[118]
	[0.222]	[0.223]	[0.217]	[0.193]	[0.155]
M&A frequency	0.038	0.037	0.053	0.037	0.039
	[65454]	[53798]	[1979]	[1326]	[125]
	[0.023]	[0.023]	[0.023]	[0.024]	[0.027]
Newlist	0.370	0.414	0.309	0.544	0.552
	[65454]	[53798]	[1979]	[1326]	[125]
	[0.483]	[0.493]	[0.462]	[0.498]	[0.499]
GDP growth	4.868	4.873	4.909	4.812	4.611
	[65080]	[53461]	[1979]	[1314]	[125]
	[1.956]	[1.992]	[1.885]	[2.166]	[1.474]
World Bank Governance index	4.260	4.235	4.367	4.173	4.284
	[59543]	[49349]	[1818]	[1292]	[116]
	[0.786]	[0.801]	[0.707]	[0.801]	[0.776]
LSSV Pagano-Volpin investor protection index	3.733	3.696	3.983	3.786	3.670
	[63369]	[51954]	[1959]	[1243]	[121]
	[1.163]	[1.153]	[1.164]	[1.087]	[1.227]
Code adoption	0.735	0.728	0.809	0.775	0.800
	[65454]	[53798]	[1979]	[1326]	[125]
	[0.441]	[0.445]	[0.393]	[0.418]	[0.402]

Table 2
Correlation matrix

Variable explanations: The World Bank governance variable is defined as the sum of three indicators: voice and accountability, regulatory quality, and rule of law. The LSSV Pagano-Volpin investor protection index (Pagano and Volpin, 2005b) is the updated investor protection index by La Porta et al. (1998). Code adoption is a dummy variable with the value of one (and onwards) when a country's first corporate governance code is adopted.

Ownership concentration is defined as the ratio between closely-held shares and common shares outstanding. Closely-held shares represents shares held by insiders. Firm value, q, is defined as market value plus total debt to total assets. Average firm value is annual country averages based upon the firm-specific q's. Stock liquidity is measured as country averages (per year) of common shares traded relatively to common shares outstanding. The M&A frequency is the annual country averages. The total private equity investment ratio is the ratio between total private equity investments and stock market value by year and country. Information on private equity investments is gathered from Deloitte (2005). Newlist is a dummy variable which assigns a firm with the value one if the firm has become listed after 1995 otherwise zero. Growth in GDP is from OECD. The * indicates statistical significance at the 5% level.

		1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*
1	*Delisting-dummy*	1																			
2	*M&A-dummy*	0.7368*	1																		
3	*Going private-dummy*	0.6239*	-0.0298*	1																	
4	*Bankruptcy & Liquidation-dummy*	0.1876*	-0.0090*	-0.0076	1																
5	*World Bank Governance index*	0.0229*	0.0370*	-0.0093*	0.0064	1															
6	*LSSV Pagano-Volpin investor protection index*	0.0433*	0.0451*	0.0131*	0.0022	0.2627*	1														
7	*Code adoption*	0.0421*	0.0340*	0.0223*	0.0095*	0.1176*	0.5036*	1													
8	*Ownership concentration*	0.0438*	0.0115*	0.0604*	-0.0079	-0.2964*	-0.3651*	-0.1905*	1												
9	*Log of total assets*	0.0094*	0.0472*	-0.0371*	-0.0176*	-0.0637*	-0.1025*	-0.0486*	-0.0666*	1											
10	*Sales per employee*	0.0175*	0.0080	0.0189*	-0.0030	0.0012	-0.0332*	-0.0130*	0.0298*	0.0459*	1										
11	*Equity to assets*	-0.0384*	-0.0093*	-0.0441*	-0.0168*	0.0382*	0.0778*	0.0497*	-0.1019*	-0.1443*	0.0049	1									
12	*Sales growth*	-0.0399*	-0.0241*	-0.0314*	-0.0076	-0.0422*	0.0022	-0.0219*	-0.0197*	-0.0326*	0.0138*	0.0484*	1								
13	*Return on assets*	-0.0191*	0.0135*	-0.0391*	-0.0247*	-0.0580*	-0.0624*	-0.0558*	0.0182*	0.1495*	0.0294*	0.0839*	0.0687*	1							
14	*Firm value, q*	-0.0392*	-0.0303*	-0.0241*	-0.0033	0.0393*	0.0578*	0.0413*	-0.0396*	-0.2647*	-0.0151*	0.0605*	0.1689*	-0.0401*	1						
15	*Average firm value*	0.0032	0.0291*	-0.0281*	-0.0031	0.2027*	0.2936*	0.1781*	-0.2183*	-0.1057*	0.0005	0.0667*	0.1212*	0.0181*	0.2709*	1					
16	*Stock liquidity*	0.0073	0.0260*	-0.0174*	-0.0082*	0.0678*	0.0163*	-0.0566*	-0.0112*	-0.0263*	0.0080	-0.0140*	0.0088*	0.0274*	0.0192*	0.0418*	1				
17	*M&A frequency*	0.0756*	0.1162*	-0.0195*	0.0008	0.3011*	0.3824*	0.2476*	-0.2500*	-0.0543*	-0.0062	0.0268*	0.0105*	0.0018	0.0740*	0.2989*	0.1902*	1			
18	*Total private equity investments ratio*	0.0085*	0.0063	0.0037	0.0066	0.1954*	0.2893*	0.3028*	-0.1628*	-0.0720*	-0.0051	0.0366*	-0.0165*	-0.0468*	0.0221*	0.1430*	0.0192*	0.0650*	1		
19	*Newlist*	0.0090*	-0.0342*	0.0493*	0.0154*	-0.0988*	-0.0444*	0.0762*	0.0007	-0.2794*	-0.0155*	0.1245*	0.1016*	-0.1290*	0.1901*	-0.0348*	-0.0441*	-0.1339*	0.0280*	1	
20	*GDP growth*	-0.0033	0.0031	-0.0068	-0.0064	0.0540*	0.2780*	0.1147*	-0.2070*	-0.0471*	-0.0209*	0.0770*	0.0712*	-0.0005	0.0531*	0.1978*	0.0757*	0.0063*	0.1116*	-0.0296*	1

4. Results

4.1. Overall delistings

We begin by estimating determinants of overall delisting using logistic regression and determinants of delisting by type using multinomial logistic regression while taking into consideration clustering of residuals by firm. We estimate the probability of delisting in year t relative to remaining listed (or more precisely the log odds ratio) as a function of a set of explanatory variables measured in the year prior to delisting (year t-1). We control for fixed industry effects[54] and (in subsequent models) for fixed country effects. We assume a linear relationship between the likelihood of delisting and measures of governance regulation mainly since the countries analyzed are all at a high investor protection level. However, we acknowledge that our main finding may imply a non-linear relationship.

We find that a higher level of investor protection is associated with more delistings (model 1), both by M&A and going private transactions (model 2), but fewer bankruptcy/liquidation cases. The positive effect on M&A transactions is consistent with previous results by Rossi and Volpin (2004), and Pagano and Volpin (2006) and can be regarded as an indication of a more active market for corporate control in nations with stronger protection of minority investors. Moreover, better minority investor protection also leads to more going private transactions which appear to support the overregulation hypothesis: apparently stronger protection of minority investors makes it *less* attractive to remain publicly listed.

We test the robustness of this result in subsequent tables. For example there are many dimensions of corporate governance policy and it is unclear whether they are all adequately captured by our policy variables, and we therefore examine the impact of fixed country effects and other governance policy measures. Moreover, theoretically corporate governance policy may be an endogenous variable which needs to be taken into account when estimating its effects. Finally, a complete analysis also needs to take

[54] We have information of the firms' main industry (SIC codes) affiliation from which we aggregate industry affiliation to 25 different industry groups.

into account new listings. It turns out that the frequency of new listings is insignificantly or negatively correlated with the available measures of corporate governance quality. We address these issues later in the paper after reviewing the impact of firm specific effects on both overall delistings and delisting types.

As for the control variables we find that firms are more likely to delist (regardless of type) if they grow slowly, have low firm value (q) and low liquidity (i.e. if market liquidity is low or ownership concentration is high).

According to the recent delisting wave there is a possibility of a time trend in delistings which should be controlled for in the analysis. We therefore control for trend or wave effects on M&A and going private transactions by including past M&A delisting frequency by country and aggregate private equity investments in the country as control variables. Both appear to lead to more delistings. We believe that these measures are able to control for the potential time trend since they individually captures the disaggregated time effects on the type of delisting. Regarding, our focus on going private transactions we would argue that our measure of volume of private equity investments relatively to public stock market value would capture the main time trend in this period.

In our model both firm valuation and country valuation (average firm value) serve as controls. The delisting decision is thus controlled for the firm-specific value relatively to the average value of other listed firms.[55] The reason why we employ both measures is that they capture a firm and market valuation effect on the likelihood of delisting.

There are interesting differences between types of delistings. Companies going private are smaller and less profitable than merged or acquired companies.

[55] Instead if the difference between firm-specific q and country average q is employed as an explanatory variable we find that when a firm is relatively 'overvalued' compared to country average it is less likely to delist (results not reported).

Table 3
Determinants of Delisting

(1) is a logit regression where the response variable is delisting. (2) is a multinomial logit regression where the response variable outcomes (delisted) are either due to a merger or acquisition, going private transaction, or bankruptcy and liquidation.

Variable explanations: Ownership concentration is defined as the ratio between closely-held shares and common shares outstanding. Closely-held shares represents shares held by insiders. Firm value, q, is defined as market value plus total debt to total assets. Average firm value is annual country averages based upon the firm-specific q's. The (total) private equity investment ratio is the ratio between total private equity investments and stock market value by year and country. Information on private equity investments is gathered from Deloitte (2005). Stock liquidity is measured as country averages (per year) of common shares traded relatively to common shares outstanding. The M&A frequency is the annual country averages. Newlist is a dummy variable which assigns a firm with the value one if the firm has become listed after 1995 otherwise zero. Growth in GDP is from OECD. The LSSV Pagano-Volpin investor protection index (Pagano and Volpin, 2005b) is the updated investor protection index by La Porta et al. (1998).

Robust standard errors are reported below parameter estimates. ***, **, * indicate statistical significance at 1%, 5% and 10% respectively.

	(1)	*(2)*		
		Delisting due to:		
Explanatory variables	*Delisted*	*M&A*	*Going private*	*Bankruptcy & Liquidation*
Ownership concentration	1.243 ***	1.247 ***	1.641 ***	-0.738
	0.106	0.127	0.202	0.615
Log of assets	0.053 ***	0.122 ***	-0.078 ***	-0.077
	0.012	0.015	0.022	0.089
Sales/employee	0.006	0.004	0.009 **	-2.889 *
	0.004	0.004	0.004	1.532
Equity to assets	-0.003 ***	0.001	-0.006 ***	-0.014 ***
	0.001	0.001	0.001	0.003
Growth in sales	-0.005 ***	-0.005 ***	-0.003 ***	0.000
	0.001	0.001	0.001	0.005
Return on assets	-0.005 **	0.002	-0.011 ***	-0.018 **
	0.001	0.001	0.002	0.008
Firm value, q	-0.157 ***	-0.170 ***	-0.176 ***	-0.135
	0.026	0.035	0.044	0.142
Average firm value	0.078	0.197 **	-0.141	0.473
	0.080	0.097	0.147	0.516
Stock liquidity	-0.604 ***	-0.292 **	-1.240 ***	-2.518 *
	0.129	0.145	0.263	1.325
M&A frequency	19.046 ***	27.823 ***	1.752	-13.722
	1.126	1.368	2.125	11.211
Private equity investment ratio	14.489 **	4.328	26.791 **	21.267
	6.109	7.858	11.213	20.643
Newlist	0.011	-0.170 **	0.305 ***	-0.006
	0.058	0.073	0.097	0.375
GDP growth	0.043 ***	0.072 ***	0.021	-0.028
	0.014	0.016	0.027	0.067
LSSV Pagano-Volpin investor protection index	0.098 ***	0.128 ***	0.105 **	-0.654 ***
	0.028	0.036	0.050	0.198
Industry dummies	YES	YES	YES	YES
Observations (firm-year)	31607		31607	
Log pseudolikelihood	-7348		-8625	
Pseudo R2	0.042		0.069	

Relatively few companies exit by bankruptcy or liquidation and the two groups are not homogenous which implies that it may be difficult to find significant results, but we choose to estimate only one set of determinants for them given their limited numerical significance. Nevertheless, the results conform well to our a priori expectations. We find that bankrupted and liquidated companies are likely to be less profitable, to have lower equity-to-asset ratios, and to be more common when stock market liquidity is low. Finally – as expected – better investor protection is found to reduce the probability of bankruptcy and liquidation.

4.2. Analysis of going private transactions

In table 4 we focus on going private transactions which is our primarily focus. The impact of the control variables is broadly similar to what was found in table 3 so we comment only on the measures of corporate governance regulation. We include more regulatory measures and break down the sample to get more information on how regulation affects going private transactions.

In table 4 model 1, we introduce a measure of general legal infrastructure (a modified version of the World Bank governance index) in addition to the investor protection index. It could be interpreted as an overall governance measure. We also control for fixed country effects to capture country differences apart from governance regulation. We find that the World Bank governance index is associated with a lower probability of going private, while a high level of minority investor protection tends to increase this probability (as we reported in table 3). The World Bank governance index combines measures of political freedom (e.g. freedom of speech, association, voting), regulatory quality (e.g. costs of regulation, efficient enforcement, presence of generally accepted codes company law) and quality of the legal system (e.g. quality of contract enforcement and court system). Apparently, better overall governance measured in this way makes it more attractive to stay listed, for example because of lower transaction costs, better monitoring and higher investor confidence. Measuring these effects using odds ratios (not reported) the odds of going private go up by approximately 90 percent when the minority investor protection index increases by one unit. The odds of favour

of going private go down by approximately 60 percent when the overall governance index increases by one unit. Large year-on-year changes in these specific indices are quite rare, but there are still large cross-country differences.[56]

In table 4 model 2 we add code adoption as an additional independent (binary) variable indicating whether a country has adopted a corporate governance code in a given year and a value of 0 if it has not. Our estimates indicate that the adoption of corporate governance codes has led to more going private transactions which could be seen as a response to increased corporate governance bureaucracy. However, code adoption is highly correlated (+0.5) with the LSSVPV index, so it may be difficult to disentangle the effect of these two variables.

In table 4 model 3 we break down the sample by period (before and after the stock market high in 2000). We find that our measures of investor protection regulation had no significant impact in the pre-2001 period when stock prices were increasing rapidly. In contrast, the effects are significant in the post-2000 period and somewhat stronger in magnitude than for the overall period (c.f. model 1). Apparently both investor protection and overall governance regulation are less important for delisting decisions in a favourable stock market climate when stock price increases outweigh governance costs.

In table 4 model 4 we check for differences between newly listed firms, i.e. firms listed after 1995 and firms listed before the beginning of the period (1995). It turns out that the impact of the governance regulation variables is significant with the same signs for both groups, although the effect of overall governance regulation is stronger for newly listed firms.

In table 4 model 5 we check for differences between small and large firms. We define firms as large if they have above average sales (per country and year), and small if they have sales below average. We find that the effects of governance regulation are weaker

[56] If a cumulative measure of changes in the LSSVPV index is used as an explanatory variable a significantly positive impact from this variable is found on the likelihood of going private (results not reported).

and insignificant for large firms, while it is stronger and significant for small firms.[57] Presumably, the benefits of being listed are larger for large firms while fixed administration costs are easier to carry for large firms. Marginal variations in corporate governance regulation therefore have less of an impact on large firms, while the costs can more easily come to exceed the benefits for small firms. This is similar to Block (2004), Engel et al. (2005) and Kamar et al. (2006), who find a particularly significant effect of the Sarbanes-Oxley act on going private for small firms.

In table 4 model 6 we examine differences between companies with low and high rates of return on accounting assets (defined by ROA > 0 and ROA ≤ 0). We find that the effect of investor protection is insignificant for companies with negative rates of return whose delisting probably has more to do with firm specific financial difficulties. Apparently, higher protection of minority investors leads more well-performing companies to go private. In contrast, the high overall governance standards appear to lead to significantly fewer delistings for both profitable and unprofitable companies. In contrast, Leuz et al. (2006) find that there is more of a Sarbanes-Oxley effect among poorly performing firms in the US.

We also examined whether the influence of governance regulation differed by ownership concentration (not reported). It might be that companies with high levels ownership concentration are more likely to go private when the private benefits of control are lower, particularly if the owners are insiders as is common in continental Europe. We do find that investor protection has a positive significant impact on going private transactions among companies with a concentrated ownership but no impact on companies with dispersed ownership.[58]
Finally, we also find that the effects of governance regulation are robust if we drop the Eastern European countries in the sample.

[57] This results hold if instead of the mean, as robustness check, a similar test is performed using the 75% percentile.
[58] Concentrated ownership is defined as either above the mean or median ownership concentration.

Table 4

Determinants of Going private

(1) - (6) are logit regression models where the response variable equals zero if listed and one if going private.

Variable explanations: Ownership concentration is defined as the ratio between closely-held shares and common shares outstanding. Closely-held shares represents shares held by insiders. Firm value, q, is defined as market value plus total debt to total assets. Average firm value is annual country averages based upon the firm-specific q's. The (total) private equity investment ratio is the ratio between total private equity investments and stock market value by year and country. Information on private equity investments is gathered from Deloitte (2005). Stock liquidity is measured as country averages (per year) of common shares traded relatively to common shares outstanding. The M&A frequency is the annual country averages. Newlist is a dummy variable which assigns a firm with the value one if the firm has become listed after 1995 otherwise zero. Growth in GDP is from OECD. The World Bank governance variable is defined as the sum of three indicators: voice and accountability, regulatory quality, and rule of law. The LSSV Pagano-Volpin investor protection index (Pagano and Volpin, 2005b) is the updated investor protection index by La Porta et al. (1998). Code adoption is a dummy variable with the value of one (and onwards) when a country's first corporate governance code is adopted.

Newly listed are firms listed after 1995. If firm-specific sales are above or equals the average sales per year and country in the delisting year they are characterized as large firms. Otherwise as small firms. Firms with ROA above zero are denoted as positive ROA firms, otherwise as negative ROA firms.

Robust standard errors are reported below parameter estimates. ***, **, * indicate statistical significance at 1%, 5% and 10% respectively.

	(1)	*(2)*	*(3)*		*(4)*		*(5)*		*(6)*	
Explanatory variables			*Before 2001*	*After 2000*	*Newly listed*	*Listed before 1995*	*Large*	*Small*	*Positive ROA*	*Negative ROA*
Ownership concentration	1.813 ***	1.807 ***	1.955 ***	1.782 ***	0.881 ***	2.440 ***	2.864 ***	1.669 ***	2.211 ***	0.924 ***
	0.210	0.210	0.335	0.267	0.322	0.280	0.765	0.221	0.276	0.339
Log of assets	-0.078 ***	-0.080 ***	-0.118 ***	-0.058 **	-0.047	-0.087 ***	-0.301 **	-0.003	-0.060 **	-0.112 **
	0.023	0.023	0.037	0.029	0.038	0.031	0.138	0.032	0.029	0.044
Sales/employee	0.024 ***	0.024 ***	0.033 ***	0.023 ***	0.025 **	0.020 ***	0.016	0.034 ***	0.026 ***	0.030
	0.007	0.007	0.012	0.008	0.013	0.004	0.017	0.011	0.007	0.038
Equity to assets	-0.006 ***	-0.006 ***	-0.009 ***	-0.004 ***	-0.004 ***	-0.006 ***	-0.008 *	-0.006 ***	-0.005 **	-0.006 ***
	0.001	0.001	0.002	0.001	0.001	0.002	0.005	0.001	0.002	0.001
Growth in sales	-0.003 **	-0.003 **	-0.003	-0.002	-0.002	-0.004 *	0.009 *	-0.004 ***	-0.007 ***	0.000
	0.001	0.001	0.002	0.002	0.002	0.002	0.005	0.001	0.002	0.002
Return on assets	-0.011 ***	-0.010 ***	-0.015 ***	-0.007 **	-0.006 **	-0.019 ***	0.013	-0.012 ***	-0.004	-0.008 ***
	0.002	0.002	0.004	0.003	0.003	0.006	0.017	0.002	0.007	0.003
Firm value, q	-0.164 ***	-0.164 ***	-0.227 ***	-0.096 *	-0.117 **	-0.200 ***	-0.146	-0.157 ***	-0.043	-0.275 ***
	0.045	0.045	0.072	0.055	0.056	0.072	0.180	0.046	0.067	0.064
Average firm value	-0.869 ***	-0.825 ***	0.738	-2.469 **	-1.877 ***	-0.440	-2.484 **	-0.789 ***	-1.134 ***	-0.280
	0.244	0.243	0.459	0.995	0.434	0.307	0.986	0.252	0.306	0.404
Stock liquidity	-1.136 ***	-1.011 ***	-2.408 ***	0.185	-0.681	-1.375 ***	-0.998	-1.159 ***	-1.073 ***	-1.972 **
	0.375	0.385	0.719	0.730	0.775	0.484	1.683	0.378	0.409	0.827
M&A frequency	3.205	2.894	6.325	5.395	0.283	7.976 **	19.272 *	2.109	7.802 **	-1.053
	2.464	2.460	4.732	3.519	3.867	3.388	10.225	2.567	3.074	4.240
Private equity investment ratio	14.169	12.015	51.881 *	0.901	16.788	11.905	54.291 **	9.116	3.838	28.309 *
	11.252	11.514	30.492	12.897	14.663	17.062	21.378	12.875	17.294	15.123
Newlist	0.118	0.097	-0.118	0.087	-0.959 ***		-0.344	0.184 *	0.245 **	-0.130
	0.100	0.101	0.198	0.123	0.299		0.483	0.103	0.118	0.176
GDP growth	0.017	0.014	0.029	0.004	0.084	-0.008	-0.122	0.028	0.020	0.011
	0.032	0.032	0.050	0.062	0.057	0.040	0.125	0.034	0.039	0.061
LSSV Pagano-Volpin investor protection index	0.618 ***	0.576 ***	0.138	1.058 ***	1.114 ***	0.656 ***	0.613	0.636 ***	0.832 ***	0.184
	0.183	0.196	0.212	0.409	0.387	0.254	0.386	0.210	0.257	0.203
World Bank Governance index	-1.010 ***	-1.056 ***	-0.285	-1.817 ***	-1.915 ***	-0.640 **	-0.946	-1.038 ***	-0.789 ***	-1.288 ***
	0.211	0.215	0.385	0.495	0.397	0.263	0.793	0.221	0.250	0.403
Code adoption		0.294 *								
		0.154								
Country dummies	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Industry dummies	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations (firm-year)	26939	26939	15255	11576	9297	17509	3618	22523	20821	5927
Log pseudolikelihood	-2758	-2756	-1140	-1569	-1108	-1596	-214	-2507	-1812	-875
Pseudo R2	0.071	0.072	0.100	0.056	0.066	0.100	0.163	0.066	0.082	0.088

4.3. Endogenous politics

Recent advances in the political economy of corporate governance have emphasized that corporate governance policies are to some extent endogenously determined (Rajan and Zingales, 2003; Pagano and Volpin, 2001, 2005b; Perotti and von Thadden, 2006; Roe, 2006). Among other factors such as legal origin, cultural, ideology, demography are believed to shape corporate governance regulation (e.g. La Porta et al., 1998; Roe, 2003; Alesina and Glaeser, 2004). This implies that statistical estimates of the effects of these policies need to take into consideration how the policies are determined. In this section we attempt to take a step in this direction. Following the literature we focus on the legal system, the voting system and unionization as likely determinants of corporate governance policies.[59]

The importance of history in shaping corporate governance has been emphasized by La Porta et al. (1998), who argue that the legal origin (civil vs. common law) remains a key determinant of corporate governance policies. It is documented that (market-supporting) common law countries are associated with stronger investor protection (e.g. La Porta et al., 1998; Djankov et al., 2007). Roe (1994a, 1994b) and Bebchuck and Roe (1999) argue that rent seeking and transaction costs can contribute to path dependency. Furthermore, La Porta et al. (1998) state that "in principle a strong system of legal enforcement could substitute for weak rules". Hence, according to this legal systems are formed by both legal design (origin) and legal enforcement. Empirically in Western Europe enforcement seems to be greater in civil law countries compared to common law countries (La Porta et al., 1998; Djankov et al., 2003b). Supporting this Pagano and Volpin (2001) argue that both regulatory design and enforcement activity affect financial regulation and capital markets development. Hence, it could be that only focusing on legal design (origins) as determinant of investor protection neglects other

[59] The legal origin variable equals 0 when common law country and 1 if civil law country (La Porta et al., 1998). The proportionality index (Pagano and Volpin, 2005b) equals 3 if 100 percent of seats are assigned via a proportional rule, 2 if the majority of seats are assigned by this rule, 1 if a minority of seats are assigned proportionally, and 0 if no seats are assigned this way. For example Scandinavian countries are given the value of 3, while UK's measure is 0. Unionization is measured as annual labor union density rates (Visser, 2006).

legal structures, especially within civil law countries, which might affect investor protection.

The voting system is another relevant governance determinant since Pagano and Volpin (2005b) argue that the design of political voting systems (proportionality) affects investor protection.[60] Proportionality of the voting system may influence the political bargaining game between investors and employees (Pagano and Volpin, 2005a). The argument here is that proportional voting pushes political parties to cater more to the preferences of social groups with homogeneous preferences (e.g. employees), while politicians in non-proportional voting systems have to do more to please the pivotal district dominated by residual groups (e.g. rentiers), which are not ideologically committed. Pagano and Volpin (2005b) empirically found that proportional electoral systems are associated with weaker investor protection. They further propose that other relevant political variables (e.g. competition between political parties and democratic tenure) affect a country's overall system. In addition, Perotti and von Thadden (2006) maintain that the behaviour of voters is important since if the wealth of the median voters increase political support should move towards favouring equity markets.

Roe (2003) suggested that concentrated ownership emerges as a counterweight to organized labor in social democratic countries. Unionization can be regarded as a proxy for social democracy. For example, strong unions may have a vested interest in takeover defenses, which protect firms and their employees against takeovers contrary to the best interests of minority investors. Pagano and Volpin (2005a) also argue that managers use employees as "shark repellents" which lower firm attractiveness and through that presumably prevent takeovers. Naturally, this is not necessarily in the interests of the shareholders. Therefore it could be argued that countries with strong unions have poorer investor protection. This is also suggested by Pagano and Volpin (2005b) who found that employment protection is usually higher in countries with proportional voting system (countries with low investor protection).

[60] If the electoral system is proportional winning a majority of the votes is crucial, whereas it is majoritarian when winning a majority of districts ensures victory.

Besides using unionization as instrument we also construct two combined variables following the arguments given above: legal origin combined with rule of law (legal system), and proportionality combined with voice and accountability (voting system). Rule of law and voice and accountability (both published by the World Bank) add additional elements to our policy measures as highlighted in the literature. Rule of law measures for instance the quality of contract enforcement while voice and accountability measures political behaviour, for example whether a country's population tends to vote in elections or has freedom of speech.

The rationale for the combined legal variable is as argued earlier that legal design and enforcement may substitute each other (La Porta el., 1998). Hence, legal origin can be considered as the legal design of a country while rule of law is a proxy for enforcement. Note that legal origin is often perceived as exogenous due to its historical origin. This interaction between legal origin and rule of law should then capture a broader measure of the legal system quality in both civil and common law countries. For example this measure whether a civil law country, with arguably a poorer legal design (could be debated), compensates by having greater public enforcement. Data also suggests that the civil law countries with better rule of law (enforcement) have better investor protection (Scandinavian countries) than other civil law countries. Common law countries seem to have strong enforcement which might indicate that enforcement especially has an impact in civil law countries.

The proportionality of the voting system can be seen as the design of a country's electoral system. This is largely historically determined and therefore exogenous. According to the literature the voting system jointly interacts with other political determinants such as state of democracy, electoral participation etc. Therefore we suggest that a more precise estimate of the system is the combined effect of political proportionality of the voting system and "voice and accountability" within a country. The idea is that a country might have an acknowledged voting system design but if democracy is weak and people do not vote then the overall voting system is not necessarily well functioning. The combined variable takes both dimensions into account.

We regard these background variables as suitable econometric instruments of investor protection policy because they are unlikely to have a direct impact on the going private frequency but affects investor protection. Specifically we would argue that legal origin, rule of law, proportionality, voice and accountability and unionization affects a firm equally whether it is listed or not.

Table 5 provides correlation coefficients with observations by country and year. It turns out that delisting frequencies at the country level are not significantly correlated with investor protection, regardless of type. We note also that investor protection and overall governance are not significantly correlated (in fact the numerical correlation is negative at the country level). It may be meaningful therefore to talk about different dimensions of corporate governance regulation. Investor protection is positively associated with the anti self-dealing index proposed by Djankov et al. (2007) and with a measure of regulatory costs (Jackson, 2005).

Interestingly, the frequency of new stock exchange listings appears to be significantly influenced neither by the LSSVPV investor protection measure nor by the modified World Bank governance index. Although we do not have the firm specific information to analyze IPOs in this paper, this indicates that higher corporate governance standards lead to fewer, rather than more IPOs. This is contrary to the findings of Pagano and Volpin (2006), perhaps because they analyze a larger data set which includes developing countries while we confine our attention to European countries which generally have a higher level of investor protection.

We find that both legal origin and the combined legal variable are highly significantly correlated with investor protection. Further, notice that the combined legal variable is not strongly correlated with the going private frequency which justifies the use as an instrument.

Table 5

Correlation matrix of alternative policy measures

Variable explanations: The delisting frequencies are determined by country and year. The LSSV Pagano-Volpin investor protection index (Pagano and Volpin, 2005b) is the updated investor protection index by La Porta et al. (1998). The World Bank governance index is defined as the sum of the indices of voice&accountability, regulatory quality, and rule of law. The anti self-dealing index is from Djankov et al. (2007). Regulatory costs and staff information is from Jackson (2005). The proportionality index and unionization is from Pagano and Volpin (2005b) and measures the proportionality of a country's voting system. It equals 3 if 100 percent of the seats are assigned proportionally, and 0 if no seats are assigned this way. Legal origin equals 0 if it is a common law country and 1 if it is a civil law country (constructed by La Porta et al. (1998)). The combined voting system variable is the proportionality index multiplied by the voice and accountability index (World Bank). Whereas the combined legal system variable is legal origin multiplied with rule of law (World Bank). Unionization is measured as annual labor union density rates (from Visser (2006)). The * indicates statistical significance at the 5% level.

		1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*
1	*Total delisting-frequency*	1														
2	*M&A delisting-frequency*	0.3852*	1													
3	*Going private delisting-frequency*	0.8497*	-0.1433*	1												
4	*Bankruptcy & Liquidation delisting-frequency*	0.3174*	-0.0818	0.2591*	1											
5	*IPO-frequency*	-0.1403	-0.0402	-0.1232	-0.0555	1										
6	*LSSV Pagano-Volpin investor protection index*	0.1505	0.1095	0.1108	-0.1110	-0.0203	1									
7	*World Bank Governance index*	-0.0445	0.3278*	-0.2200*	-0.1362	-0.1450	-0.1563	1								
8	*Anti self-dealing index*	0.1462*	0.4291*	-0.0861	-0.0169	-0.0729	0.4767*	0.2490*	1							
9	*Regulatory cost*	0.1483	0.3400*	-0.1061	-0.0663	-0.0632	0.2956*	0.3544*	0.6552*	1						
10	*Regulatory staff*	0.1247	0.2460*	-0.0513	-0.0697	-0.0783	0.3260*	-0.0998	0.3073*	0.5834*	1					
11	*Proportionality index*	-0.0417	-0.1364	0.0827	-0.0992	-0.0773	-0.4445*	0.1455	-0.5605*	-0.2104*	0.1651*	1				
12	*Unionization*	-0.0896	0.0474	-0.1261	-0.1003	0.1108	-0.2228*	0.4459*	-0.1516	-0.0131	-0.0603	0.5568*	1			
13	*Legal origin*	-0.0844	-0.3465*	0.1068	0.0137	0.0400	-0.5210*	-0.2530*	-0.7030*	-0.9147*	-0.5411*	0.4287*	0.1259	1		
14	*Combined voting system variable*	-0.0469	-0.0864	0.0342	-0.1116	-0.0665	-0.4589*	0.4381*	-0.4441*	-0.1107	0.0943	0.9316*	0.6666*	-0.3512*	1	
15	*Combined legal system variable*	-0.0794	0.0373	-0.0999	-0.0670	-0.0659	-0.5807*	0.6271*	-0.3181*	-0.6471*	-0.6123*	0.4782*	0.3953*	0.5621*	0.5717*	1

Proportionality of the voting system has been suggested as an explanation of low investor protection (Pagano and Volpin, 2005b) and we do observe that this variable is negatively correlated with the LSSVPV investor protection (and anti self-dealing indices). However, it is not significantly correlated with the World Bank governance index. The combined voting (and maybe more precise) variable is also negatively correlated with investor protection, yet not correlated with the going private frequency.

Finally, unionization could be an important determinant of political pressure to protect labor (Roe, 2003), perhaps at the cost of minority investors. In accordance with this hypothesis we observe that unionization (Visser, 2006) is in fact strongly positively correlated with the World Bank governance index, but strongly negatively correlated with the LSSVPV investor protection index. Interestingly, unionization is positively correlated with proportionality of the voting system (which should point in the direction of less investor protection according to Pagano and Volpin, 2005a). Also notice that the correlation between unionization and going private frequency is low.

In principle, it should be possible to obtain better estimates of the effects of corporate governance policy on delistings by including these variables, particularly to the extent that they can be regarded as econometric instruments which influence policy without a direct influence on delisting frequencies. In practice, however, our endogenous policy models tend to be quite sensitive to specification. With this caveat table 6 present estimates of the effect of investor protection regulation on the going private frequency, while treating the policy variable as endogenously determined. We now aggregate our information to country averages per year. According to the Hausman tests performed we estimate fixed effects models.

Table 6 represents different two stage least squares instrumental variable regressions. Model 1 to 3 represents regressions using the instruments separately, while model 4 and 5 uses all three instruments jointly.

Table 6

Determinants of Going Private frequency: Two stage least squares instrumental variable regressions on going private frequencies

Variable explanations: The LSSV Pagano-Volpin investor protection index (Pagano and Volpin, 2005b) is the updated investor protection index by La Porta et al. (1998). The combined legal system variable is legal origin (civil law equals 1 and common law equals 0) multiplied by rule of law (Wold Bank). Legal origin is based on La Porta et al. (1998). The combined voting system variable is the proportionality index Pagano and Volpin (2005b) multiplied with the voice and accountability index (World Bank). Proportionality measures the proportionality of a contry's voting system. Proportionality equals 3 if 100 percent of seats are assigned via a proportional rule, 2 if the majority of seats are assigned by this rule, 1 if a minority of seats is assigned proportionally, and 0 if no seats are assigned this way. Unionization is measured as yearly labor union density rates, 1995-2004 (Visser, 2006). Robust standard errors are reported below parameter estimates. ***, **, * indicate statistical significance at 1%, 5% and 10% respectively.

	Going private frequency				
Endogenous policy variable	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*
LSSV Pagano-Volpin investor protection index	0.0597 *	0.1644 *	0.0735 ***	0.0736 **	0.0521 **
	0.0309	0.0957	0.0233	0.0300	0.0234
Controls					
Annual country average ownership concentration					0.2845 **
					0.1194
Annual country average sales growth					-0.0007 **
					0.0003
Instrumental variables					
Combined legal system variable	x			x	x
Combined voting system variable		x		x	x
Unionization			x	x	x
Firm effect	FIXED	FIXED	FIXED	FIXED	FIXED
F-value	3.70	2.93	9.81	5.97	3.54
P-value	0.057	0.090	0.002	0.017	0.018
Hansen J Chi-square p-value	0.000	0.000	0.000	0.158	0.007
Observation (country years)	134	134	111	98	98

In the first model the combined legal system variable is employed as instrument. We find that the LSSVPV investor protection variable leads to a higher frequency of going private transactions when the index is instrumented by the combined legal variable, however, it is only significant on a 10 percentage significance level. The usefulness of the instrument is further tested and found valid (the Hansen J test). In the second model where the combined voting system variable is used as instrument we also find a positive effect from investor protection regulation (10 percentage significance level). Also note

that the test of overidentification accepts the instrument. When unionization is used as the instrument for investor protection regulation (model 3) we obtain a stronger positive significant result compared to previous models. Again the Hansen J test also accepts the validity of this instrument.

Finally, we employ the three instruments jointly (model 4 and 5) and both models suggests that higher investor protection index is associated with higher going private frequencies (at a 5 percentage significance level). However, the instruments are only accepted when controls are added to our econometric specification. Hence, the result seems less robust when all instruments are jointly applied. In the last model we control for ownership structure (the fraction of closely held shares) and sales growth, but drop other control variables which become insignificant when aggregated to the country level. Countries with high ownership concentration tend to have a significantly higher frequency of going private transactions, whereas countries with high sales growth seem to have a significantly lower going private frequency. Altogether, these results support our previous finding but we acknowledge that these are sensitive to specification. Finally, we do acknowledge that we face the same limitations in finding suitable instruments for governance policy as the remaining governance literature.

5. Discussion

Delistings are an important phenomenon. From 1995 to 2005 30% of the population of listed European firms was delisted for one reason or another. Along with IPOs delistings can be regarded as a measure of the attractiveness of being listed. The hypothesis we test relates to the costs and benefits of investor protection regulation. For example, if new corporate governance regulation – e.g. investor protection or codes – increase bureaucracy and transaction costs without adding sufficient value to minority investors – it may be profitable to take companies private or to merge them to spread the fixed costs of governance over a greater volume. This we would call the overregulation hypothesis. In contrast if the costs of corporate governance regulation are exceeded by increasing efficiency of listed companies, less expropriation of

minority investors and greater transparency, companies and their owners will find it more attractive to remain listed. This we think of as the efficiency hypothesis.

Overall delisting frequencies are positively correlated with the measure of investor protection, the classical anti-director rights index updated by Pagano and Volpin (2005b) and with the World Bank governance index. Investor protection also leads to more going private transactions, but higher levels the World Bank index are associated with fewer going private transactions. The positive association between investor protection and delisting by M&A or by going private continues to hold after controlling for relevant control variables in multinomial logistic regression. Thus, better protection of minority investors appears to lead to more going private transactions. The adoption of corporate governance codes also appears to lead to more going private transactions. This is consistent with the overregulation hypothesis, i.e. when costs of investor protection regulation outweigh the benefits. Bruno and Claessens (2007) also found support for the overregulation hypothesis while investigating the effects of corporate governance regulation on firm valuation. We did find some indication that better overall governance (as measured by the World Bank governance index) was associated with fewer going private transactions, which tends to support the efficient regulation hypothesis with regard to overall governance: regulation improves the functioning of stock markets and therefore strengthens the market for corporate control and increases the incentive to remain listed.

Taking into consideration that corporate governance regulation may be an endogenous variable makes the relationship more ambiguous since it is difficult to identify proper economic instruments which influence investor protection without possibly also influencing the going private decision. Nevertheless our best estimates indicate that investor protection regulation tends to increase the frequency of going private transactions.

Obviously, we cannot deduce from this that protecting minority investors is harmful. It may be that gains in investor confidence are well worth the costs of some delisted companies. But our findings do indicate that there are costs as well as benefits of being

listed and that these relates to corporate governance regulation. One of the costs might be that lower private benefits of control and more formalized corporate governance practices will lead some companies to delist. While some regulation is necessary and beneficial to stock market development, there may also be limits to regulation, for example how much minority investors should be protected in a zero sum game with other interest groups such as large shareholders, employees or creditors. Moreover, it is not difficult to understand how political processes can sometimes lead to socially wasteful regulation (Djankov et al., 2003; Olson, 2000).

Cross sectional empirical studies in the law and finance tradition indicate that a high level of investor protection is correlated with large stock markets (e.g. La Porta et al., 1998). It is also noteworthy that a country like UK with high investor protection scores does not have particularly many going private transactions whereas Austria and Denmark – which have only recently begun to update their corporate governance policies – experienced a wave of delistings in the 1995-2005 period. It may be necessary to distinguish between short term adjustments and long term cross sectional effects. An alternative interpretation is that the increase in investor protection is a proxy for a series of other regulatory changes relating to self dealing, corporate governance codes and a host of EU directives which in combination may have increased the costs of governance beyond the optimum.

We would not claim that overregulation is the only or even the main cause of delistings in the European stock markets since 2000. One important driver is clearly changes in market value during the boom and bust of the 2000 stock market bubble. Another driver is the emergence of private equity funds in Europe during the same period. We have controlled for both of these factors in our regressions and find that both of them have an important impact. We note, however, that overregulation would influence both market valuations and the emergence of private alternatives to the stock market in a way which would also tend to lead to more delistings. A complete model of the effects of stock market regulation would have to take these complex combined effects of regulation into account.

References

1) Alesina, A., Glaeser, E., 2004. Fighting Poverty in the US and Europe. Oxford University Press.
2) Altman, E.I., 1968. Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy. *Journal of Finance* 23(4), 589-609.
3) Altman, E.I., 1993. Corporate Financial Distress and Bankruptcy. John Wiley and Sons, New York.
4) Andrade, G., Mitchell, M., Stafford, E., 2001. New Evidence and Perspectives on Mergers. *Journal of Economic Perspectives* 15(2), 103-120.
5) Baker, M., Wurgler, J., 2002. Market Timing and Capital Structure. *Journal of Finance* 57(1), 1-32.
6) Barnes, P., 2000. The identification of UK takeover targets using published historical cost accounting data. Some empirical evidence comparing logit with linear discriminant analysis and raw financial ratios with industry-relative ratios. *International Review of Financial Analysis* 9(2), 147-162.
7) Bebchuk, L.A, Roe, M.J., 1999. A Theory of Path Dependence in Corporate Ownership and Governance. *Stanford Law Review* 52, 127-170.
8) Becchetti, L., Sierra, J., 2003. Bankruptcy Risk and Productive Efficiency in Manufacturing Firms. *Journal of Banking and Finance* 27, 2099–2120.
9) Beck, T., Demirguc-Kunt, A., Levine, R., 2001. Legal theories of financial development. *Oxford Review of Economic Policy* 17(4), 483-501.
10) Beck, T., Demirguc-Kunt, A., Levine, R., 2003a. Law, Endowment, and Finance. *Journal of Financial Economics* 70(2), 137-181.
11) Beck, T., Demirguc-Kunt, A., Levine, R., 2003b. Law and finance: Why does legal origin matter? *Journal of Comparative Economics* 31(4), 653-675.
12) Beck, T., Levine, R., 2004. Stock markets, banks, and growth: Panel evidence. *Journal of Banking & Finance* 28(3), 423-442.
13) Beck, T., Levine, R., Loayza, N., 2000. Finance and the sources of growth. *Journal of Financial Economics* 58(1-2), 261-300.

14) Bharath, S.T., Dittmar, A.K., 2006. To Be or Not to Be (Public). Using going private transactions to examine why firms go public. University of Michigan Ross School of Business Research Paper.
15) Block, S., 2004. The Latest Movement to Going Private: An Empirical Study. *Journal of Applied Finance* 14(1), 36-44.
16) Boot, A., Gopalan, R., Thakor, A., 2006. The Entrepreneur's Choice between Private and Public Ownership. *Journal of Finance* 61, 803-836.
17) Bruno, V., Claessens, S., 2007. Corporate Governance and Regulation: Can There Be Too Much of a Good Thing? Working paper.
18) Buehler, S., Kaiser, C., Jaeger, F., 2006. Merge or Fail? The Determinants of Mergers and Bankruptcies in Switzerland, 1995-2000. *Economics Letters* 90(1), 88-95.
19) Burkart, M., Gromb, D., Panunzi, F., 1997. Large Shareholders, Monitoring, and the Value of the Firm. *Quarterly Journal of Economics* 112, 693-728.
20) Cadbury Commission, 1992. Code of best practice: Report of the committee on the financial aspects of corporate governance. Gee and Co, London.
21) Coase, R.H., 1992. The Institutional Structure of Production. *American Economic Review* 82(4), 713-719.
22) Cudd, M., Duggal, R., 2000. Industry Distributional Characteristics of Financial Ratios: An Acquisition Theory Application. *Financial Review* 35(1), 105-120.
23) Dahlman, C.J., 1979. The Problem of Externality. *Journal of Law and Economics* 22(1), 141-162
24) Deloitte, 2005. News Release: European Buy-out market continues to break records.
25) Dewey, D., 1961. Mergers and Cartels: Some Restrictions about Policy. *American Economic Review. Papers and Proceedings of the Seventy-Third Annual Meeting of the American Economic Association* 51(2), 255-262.
26) Dietrich, J.K., Sorensen, D.E., 1984. An Application of Logit Analysis to Prediction of Merger Targets. *Journal of Business Research* 12, 393-402.
27) Djankov, S., Glaeser, E., La Porta, R., Lopez-de-Silanes, F., Shleifer, A., 2003. The new comparative economics. *Journal of Comparative Economics* 31, 595–619.
28) Djankov, S., La Porta, R., Lopez de Silanes, F., Shleifer, A., 2007. The Law and Economics of Self-Dealing". *Journal of Financial Economics*, forthcoming.

29) Doidge, C., Karolyi, A., Stulz, R., 2007. Has New York Become less Competitive in Global Markets? Evaluating Foreign Listing Choices over time. Working paper.

30) Engel, E., Hayes, R., Wang, X., 2005. The Sarbanes-Oxley Act and Firms' Going-Private Decisions. Working paper, University of Chicago.

31) Foucault, T., Parlour C.A., 2004. Competition for Listings. *RAND Journal of Economics* 35(2), 329-355.

32) Harlow, W.V., Howe, J.S., 1993. Leveraged buyouts and insider non trading. *Financial Management* 22, 109-118.

33) Harford, J., 2005. What drives merger waves? *Journal of Financial Economics* 77(3), 529-560.

34) Hermalin, B.E., Weisbach, M., 2005. Trends in Corporate Governance. *Journal of Finance* 60(5), 2351-2384.

35) Hillegeist, S.A., Keating, E.K., Cram, D.P., Lundstedt, K.G., 2004. Assessing the Probability of Bankruptcy. *Review of Accounting Studies* 9, 5–34.

36) Jackson, H., 2005. Variation in the Intensity of Financial Regulation: Preliminary Evidence and Potential Implications. Discussion paper no. 521, Harvard Law School.

37) Jensen, M.C., 1986. Agency costs of free cash flow, corporate finance and takeovers. *American Economic Review* 76(2), 323-329.

38) Jensen, M.C., 1989. Active Investors, LBOs and the Privatization of Bankruptcy. *Journal of Applied Corporate Finance* 2, 35-44.

39) Johnson, M., 2003. Austria Struggles for Attention. *Global Finance* 17(6), 36.

40) Kamar, E., Karaca-Mandic, P., Talley, E., 2006. Going-Private Decisions and the Sarbanes-Oxley Act of 2002: A Cross-Country Analysis. Center in Law, Economics and Organization Research paper series (no. C06-05) and Legal studies Research paper series (no. 06-10), University of Southern California.

41) Kaplan, S.N., 1989. Management buyouts: evidence on taxes as a source of value. *Journal of Finance* 44, 611-632.

42) Kaufman, D., Kraay, A., Mastruzzi, M., 2005. Governance Matters IV: Governance Indicators 1996-2004. Working paper, World Bank.

43) Kaufman, D., Kraay, A., Mastruzzi, M., 2006. Governance Matters V: Governance Indicators 1996-2005. Working paper, World Bank.

44) Leuz, C., Triantis, A., Wang, T., 2006. Why Do Firms Go Dark? Causes and Economic Consequences of Voluntary SEC Deregistrations. Robert H. Smith School Research paper, no. RHS 06-045.

45) La Porta, R., Lopez-de-Silanes, F., Shleifer, A., 2006. What Works in Securities Laws? *Journal of Finance* 61, 1-32.

46) La Porta, R., Lopez-de-Silanes, F., Shleifer, A., Vishny, R., 1997. Legal Determinants of External Finance. *Journal of Finance* 52(3), 1131-1150.

47) La Porta, R., Lopez-de-Silanes, F., Shleifer, A., Vishny, R., 1998. Law and Finance. *Journal of Political Economy* 106(6), 1113-1155.

48) La Porta, R., Lopez-de-Silanes, F., Shleifer, A., Vishny, R., 1999. Corporate ownership around the world. *Journal of Finance* 54(2), 471-519.

49) La Porta, R., Lopez-de-Silanes, F., Shleifer, A., Vishny, R., 2000a. Agency Problems and Dividend Policies around the World. *Journal of Finance* 55(1), 1-33.

50) La Porta, R., Lopez-de-Silanes, F., Shleifer, A., Vishny, R., 2000b. Investor protection and corporate governance. *Journal of Financial Economics* 58 (1-2), 3-27.

51) La Porta, R., Lopez-de-Silanes, F., Shleifer, A., Vishny, R., 2002. Investor protection and corporate valuation. *Journal of Finance* 57(3), 1147-1170.

52) London Stock Exchange (LSE), 2005. AIM Market Statistics, January 2005.

53) Lowenstein, L., 1985. Management buyouts. *Columbia Law Review* 85, 730-784.

54) Macey, J., O'Hara, M., 2002. The Economics of Stock Exchange Listing Fees and Listing Requirements. *Journal of Financial Intermediation* 11(3), 297-320.

55) Marais, L., Schipper, K., Smith, A., 1989. Wealth effects of going private for senior securities. *Journal of Financial Economics* 23(1), 155-191.

56) Marosi, A., Massoud, N., 2005. Why Do Firms Go Dark? *Journal of Financial and Quantitative Analysis*, forthcoming.

57) Mitchell, M.L., Mulherin, J.H., 1996. The Impact of Industry Shocks on Takeover and Restructuring Activity. *Journal of Financial Economics* 41(2), 193-229.

58) Mulherin, J.H., Netter, J.M., Overdahl, J.A., 1991. Prices Are Property: The Organization of Financial Exchanges from a Transaction Cost Perspective. *Journal of Law and Economics* 34(2), 591-644.

59) Nuttal, R., 1999. An Empirical Analysis of the Effects of the Threat of Takeover on UK Company Performance. Economics Papers 1999-w5, Economics Group, Nuffield College, University of Oxford.

60) Olson, M., 2000. Power and Prosperity: Outgrowing Communist and Capitalist Dictatorships. Basic Books, New York, NY.

61) Pagano, M., Volpin, P., 2001. The Political Economy of Finance. *Oxford Review of Economic Policy* 17, 502-519.

62) Pagano, M., Volpin P., 2005a. Workers, Managers, and Corporate Control. *Journal of Finance* 60, 841-868.

63) Pagano, M., Volpin, P., 2005b. The Political Economy of Corporate Governance. *American Economic Review* 95(4), 1005-1030.

64) Pagano, M., Volpin, P., 2006. Shareholder Protection, Stock Market Development, and Politics. *Journal of the European Economic Association* 4, 315-341.

65) Palepu, K.G., 1986. Predicting Takeover Targets. *Journal of Accounting and Economics* 8(1), 3-35.

66) Perfect, S., Wiles, K., 1994. Alternative Constructions of Tobin's q: An Empirical Comparison. *Journal of Empirical Finance* 1, 313-341.

67) Perotti, E., Von Thadden, E.L., 2006. The political economy of corporate control and labor rents. *Journal of Political Economy* 114(1), 145-174.

68) Pirrong, S.C., 1995. The Efficient Scope of Private Transactions-Cost-Reducing Institutions: The Successes and Failures of Commodity Exchanges. *Journal of Legal Studies* 24(1), 229-255.

69) Rajan, R., Zingales, L., 2003. The Great Reversals: The Politics of Financial Development in the 20th Century. *Journal of Financial Economics* 69(1), 5-50.

70) Rhodes-Kropf, M., Viswanathan, S., 2004. Market valuation and merger waves. *Journal of Finance* 59, 2685–2718.

71) Roe, M.J., 1994a. Some Differences in Corporate Governance in Germany, Japan and America, chapter 2 in Baums, T., Buxbaum, T., Hopt, K.J., ed., Institutional Investors and Corporate Governance. de Gruyter, Berlin.

72) Roe, M.J., 1994b. Strong Managers, Weak Owners - the Political Roots of American Corporate Finance. Princeton University Press, Princeton.

73) Roe, M.J., 2003. Political Determinants of Corporate Governance. Oxford University Press.

74) Roe, M.J., 2006. Legal Origins and Modern Stock Markets. *Harvard Law Review,* forthcoming.

75) Rossi, S., Volpin, P., 2004. Cross-Country Determinants of Mergers and Acquisitions. *Journal of Financial Economics* 74, 277-304.

76) Seguin, P.J., Smoller, M.M., 1997. Share price and mortality: An Empirical evaluation of newly listed NASDAQ stocks. *Journal of Financial Economics* 45(3), 333-363.

77) Schary, M.A., 1991. The probability of exit. *RAND Journal of Economics* 22, 339–353.

78) Shleifer, A., Summers, C.H., 1988. Breach of trust in hostile takeovers, chapter 2 in Auerbach, A.J., ed., Corporate takeovers: causes and consequences. University of Chicago Press, Chicago.

79) Shleifer, A., Vishny, R., 1997. A Survey of Corporate Governance. *Journal of Finance* 52, 737-783.

80) Shleifer, A., Vishny, R., 2003. Stock market driven acquisitions, *Journal of Financial Economics* 70, 295–331.

81) Stulz, R., 2005. The Limits of Financial Globalization. *Journal of Finance* 60(4), 1595-1638.

82) Telser, L.G., 1981. Why There Are Organized Futures Markets. *Journal of Law and Economics* 24(1), 1-22.

83) Thuesen, J.U., 2007. New Rules for the European Securities Markets (Nye regler for de europæiske Værdipapirmarker). The Danish Central Bank, Quarterly Report 1. Quarter 2007.

84) Visser, J., 2006. Union membership statistics in 24 countries. *Monthly Labor Review* 129(1), 38-49.

85) White, M.J., 1989. The Corporate Bankruptcy Decision. *Journal of Economic Perspectives* 3(2), 129-151.

86) Williamson, O.E., 1985. The Economic Institutions of Capitalism. The Free Press, New York.

87) Williamson, O.E., 2005. The Economics of Governance. *American Economic Review* 95(2), 1-18.

88) Zhang, I., 2005. Economic Consequences of the Sarbanes-Oxley Act of 2002. University of Rochester, Working paper.

89) Zingales, L., 2007. Is the U.S. Capital Market Losing its Competitive Edge? *Journal of Economic Perspectives*, forthcoming.

Equity Market Timing and the Decision to Delist[61]

Steen Thomsen[62]
Center for Corporate Governance
Copenhagen Business School

Frederik Vinten[63]
Copenhagen Business School
Centre for Economic and Business Research (CEBR)

Abstract:

We study the impact of stock market valuations on delistings from European stock exchanges 1996-2004. Previous research has found that mergers and acquisitions (M&A) occur more often when market valuations are high. This is paradoxical since it implies that companies are more likely to engage in M&A when it is most expensive. In accordance with prior research we find that delistings by mergers and acquisitions are more likely when industry market-to-book values (q) are high. In contrast, we find no effect of industry q on going private transactions. The data also suggest that M&A are more likely to take place in bull years while going private transactions are relatively more likely in bear years. Our study is the first comprehensive study of delistings in Europe and the first study to demonstrate that going private transactions appear to be driven by different causal mechanisms than M&A.

JEL classifications: G14; G24; G32; G34.
Key words: Delisting, market timing, merger, acquisitions, going private, private equity.

[61] We are grateful to Morten Bennedsen, Steffen Andersen and Martin Junge for helpful comments. We also thank seminar participants at Department of Economics, Copenhagen Business School; European Doctoral Research Conference 2007, Tanaka Business School, Imperial College London.
[62] Professor Steen Thomsen, Director of the Center for Corporate Governance, Department of International Economics and Management, Copenhagen Business School, Porcelænshaven 24, 2000 Frederiksberg, Denmark. Phone: +45 38152590. Fax: +45 38152500. E-mail: st.int@cbs.dk.
[63] Frederik Vinten, PhD student, Department of Economics, Copenhagen Business School, and Centre for Economic and Business Research (CEBR). Porcelænshaven 16A, DK-2000 Frederiksberg, Denmark. E-mail: fv.eco@cbs.dk.

1. Introduction

It is no secret that stock markets tend to fluctuate and a substantial body of research indicates that these fluctuations have consequences for firm behaviour (Barro 1990; Morck and Shleifer, 1990; Comment and Jarrel, 1995; Levine 1997; Baker and Wurgler, 2002; Baker, Stein and Wurgler, 2003). One interesting question is whether market participants are able to time their investments such that they exploit the ups and downs of the stock market. For example this may be the case if more firms tend to go public when stock prices are high compared to earnings or book values (e.g. Lowry and Schwert, 2002; Benninga et al., 2005).

By implication one would think that the decision to delist might also be influenced by stock prices. For example, smart buyers could time their investments such that they buy and delist publicly traded companies when stock prices are low but refrain from doing so when stock prices are high (a contrarian or counter-cyclical strategy). However, there is now substantial evidence that an important type of delistings – by mergers and acquisitions (M&A) - is pro-cyclical: there are more acquisitions when market values are high compared to earnings or book values of equity (e.g. Nelson, 1959; Maksimovic and Phillips, 2001; Shleifer and Vishny, 2003; Rhodes-Kropf and Viswanathan, 2004; Rhodes-Kropf et al., 2005; Ang and Chen, 2007). The most obvious explanation seems to be that potential acquirers are more eager to buy when stock prices are high because their own prices are also high (which would tend to reduce their implied costs of capital), because they tend to have more money to spend in good times or because they become more optimistic when things appear to be going well. This is also known as the behavioural argument which arises from misvaluation.

In this connection it is interesting to inquire whether going private transactions follow the same pattern. In recent years a wave of going private transactions has swept across both Europe and the United States. The wave reflects the emergence of private equity funds in Europe, but also transactions in which incumbent blockholders decide to take their companies private. In both cases the buyers are not listed and may therefore, following the behavioural argument, be less sensitive to short term market fluctuations.

Could it be that these buyers are not (as) affected by corporate misvaluations? Are these buyers thereby able to time market interventions such that they buy when stock prices are low rather than when they are high? These are the questions we seek to answer in this paper. Remark it is not within our scope to test whether markets are efficient or not. The focus is on testing how stock market fluctuations affect delistings.

Delistings from a stock exchange can take place in different ways. A company may be acquired by another company or merged with it and the target firm will then be delisted. It may be acquired by new owners (e.g. a private equity fund) and delisted. It may go bankrupt or be liquidated by the incumbent owners. In rare cases it may even be involuntarily delisted by the stock exchange because of failure to comply with the listing standards. In this paper we focus on M&A and going private transactions which account for 96 percent of the delistings in our sample. Specifically we focus on how misvaluation affects going private transactions. We define a going private transaction as the acquisition and subsequent delisting of a listed company by a private non-corporate buyer (e.g. a private equity fund, a large non-corporate blockholder or the incumbent management). In contrast, M&A is defined as merger with or acquisition by another company, which may or may not be a listed entity.

We make use of a unique and hitherto unexplored dataset of delistings from European stock exchanges which we are able to track over the period 1996-2004. Using this dataset we demonstrate that mergers and acquisitions tend to be pro-cyclical in accordance with previous studies on US data. We do not find the same bias for going private transactions.

The findings have important implications for the understanding of going private transactions. A number of studies have examined how private equity buyout transactions influence the operating performance of acquired companies (e.g. Kaplan, 1989a; Smith, 1990; Desbrières and Schatt, 2002; Cressy et al., 2007; Guo et al., 2007, Vinten, 2007), but the results appear to be mixed. However, going private buyers may also create value if they are able to time their investments so as to profit from stock market fluctuations. This may not enable private equity funds or large owners (like

founding families) to beat the stock market (e.g. Gottschalg et al., 2004; Kaplan and Schoar, 2005), but at least they can avoid the value bias which we observe for corporate buyers.

The paper is structured as follows. In section 2 on related literature we particularly discuss how the theoretical relationship between M&A and market timing can be linked to going private transactions. In section 3 we discuss the data set which covers all delistings from European stock exchanges (21 countries) over the period 1995-2005 with minor exceptions. In section 4 we analyse the probability of delistings by type (mergers and acquisition, going private) by both logistic regressions and multinomial logistic regressions. Controlling for other variables, we find that the probability of a company being delisted in the subsequent year decreases with firm value (q-company) regardless of type. Average industry q (q-industry) tends to increase the frequency of M&A, but not going private transactions. We clarify these results by analysis of different characteristics of companies while investigating whether misvaluation errors are more profound in certain companies. Our results indicate that misvaluation errors do not seem to drive M&A of large firms and firms in the financial industry. We believe that these results support our hypothesis that both large firms and financial firms are easier to evaluate for investors. In particular we estimate that the probability of going private compared to being M&A is significantly lower in peak years (where industry or country q is highest), while the probability of M&A is significantly higher in peak years. Finally, in the discussion, we comment on the significance of our findings. We cannot demonstrate that it would have been more profitable for companies to imitate the timing of private buyers in terms of higher subsequent returns.

2. Related literature

2.1. Mergers and Acquisitions

From the literature two hypotheses are introduced that explains why periods with high stock market valuations coincide with intense M&A activity: 1) The neoclassical view where M&A activity mainly reflect industry reorganization opportunities. 2) The behavioural view where valuation errors affect M&A activity.

According to what may be termed neoclassical or perhaps "efficient markets" theory, stock prices reflect fundamental values well, so that a high market value compared to earnings, accounting assets or accounting equity simply reflects that a firm has better prospects. As such M&A is not driven by valuation, but by changes in technology, regulation or market conditions which influence the fundamental value of firms. Merger waves reflect industry reorganization whereby assets become redeployed toward more efficient use. For example industry shocks (like deregulation or new technology) can necessitate horizontal mergers to restructure an industry (Gort, 1969). Andrade, Mitchell and Stafford (2001) and Mitchell and Mulherin (1996) find that merger activity in 1990s in the U.S. was clustered by industry. In industries characterized by overcapacity M&A may simply be *"a civilized alternative to bankruptcy"* (Dewey, 1961). Jovanovic and Rousseau (2002a, 2002b) model how technological changes can lead to merger waves through dispersion in q-ratios which make it attractive for high-q firms to take over low-q firms. Their theory is supported by an empirical study by Dong et al. (2006). However, Harford (2005) maintains that technological changes are moderated by capital liquidity so that industry shocks will only generate a merger wave if adequate capital liquidity exists to accommodate the reallocation of assets. Neoclassical theory is consistent with agency theory, which emphasizes the role of M&A in the market for corporate control (Jensen 1986, 1989). M&A can be both a solution and a symptom of agency problems. Managerial inefficiency could show up in low market-to-book value making the firm a more likely target for acquisition because of dissatisfaction among the incumbent owners (Jensen, 1986; Palepu, 1986). The acquiring firm can replace inefficient management and increase earnings in the long run.

According to the behavioural view inefficient financial markets can lead to misvaluation (deviations between market and fundamental values of firms), and these misvaluations may drive merger waves. Undervaluation (low market-to-book or price-earnings ratio) implies that targets are less expensive and so more attractive to buy (Dietrich and Sorensen, 1984; Palepu, 1986; Cudd and Duggal, 2000; Shleifer and Vishny, 2003; Rhodes-Kropf and Viswanathan, 2004). This idea goes back to the study

by Nelson (1959) which shows that stock market valuations affect merger activity. Shleifer and Vishny (2003) claim that merger transactions are driven by stock market valuations of merging firms. Thus mergers are modelled as a sort of arbitrage by rational managers operating in inefficient markets hence, managers are aware of stock market inefficiencies. The main finding is that dispersion of valuations among firms generates merger waves and particularly that overvalued firms acquire undervalued targets. To some extend this prediction overlaps with the (neoclassical) restructuring argument which is likely present in diversified industries. Similarly, Rhodes-Kropf and Viswanathan (2004) propose a model of rational managerial behaviour and misvaluation which leads to a correlation between market performance and merger waves. Thus, it is difficult for target managers to assess the true value of the bid since they have limited private information compared to bidder managers. Intuitively rational targets without perfect information will accept more bids from overvalued acquirers when market valuation is high since they tend to overestimate synergies during these periods. Valuation errors are also more likely present in deals where shareholders of the target firm are offered shares in the bidding firm. In addition Rhodes-Kropf and Viswanathan argue that cash bids will not be affected by misvaluation. Overall, their idea is that M&A waves are affected by valuation regardless of any underlying (neoclassical) motivation for M&A.

Even though the two behavioural theories differ, they both rely on the acquirers taking advantage of temporary misvaluations together with dispersion in misvaluations in the market. In an empirical study, Rhodes-Kropf et al. (2005) find support for the behavioural hypothesis that misvaluation drive mergers. Specifically, they find that acquirers with high (overvalued) market value use stock to acquire targets with relatively low (undervalued) market value. Moreover they find that merger intensity is highly positively correlated with short-run deviations from long run trends in market valuation. This result is especially strong when stocks are used as the method of payment. A similar study by Ang and Chen (2007) also finds that overvaluation increases the probability of firms becoming acquirers and the probability of using their own stocks as payment.

Remember that it is not our focus to test whether financial markets are efficient or not. Testing for market efficiency is difficult, as noted by for e.g. Dimson and Mussavian (2000), especially when there are relatively few historically events to analyze as in the case of M&A and going private waves.

2.2. Going private transactions

There are different theoretical arguments that explain going private transactions. We will briefly highlight some of them, but focus on the linkage between the behavioural view and going private transactions. According to neoclassical theory going private transactions can be regarded as reverse public offerings. The trade off between risk and incentives may change because of increases in firm size, better growth prospects or increases in firm specific risk (Bharath and Dittmar, 2006). If companies list because their stockholders can benefit from attracting new equity capital and from increased stock liquidity, companies can go private if these listing benefits are no longer present. This implies that smaller companies with less liquid stocks and worse growth prospects will be more likely to go private (Bharath and Dittmar, 2006). The neoclassical argument where M&A waves correlates with industrial restructuring possibilities may also apply to going private transactions. This seems actually to be the case in 1980s because inefficient firms were among the main targets of buyout funds (Jensen et al., 2006).

Jensen (1986, 1989) proposed that going private transactions (leveraged buyouts) can be regarded as an efficient response to agency problems in publicly listed companies. For example, private equity funds can target companies which – for whatever reason – deviate substantially from shareholder value maximization. This type of transaction could be directed at companies with low ownership concentration, large retained free cash flow, high equity to assets ratios or excess employment compared to industry benchmarks.

An alternative line of research maintains that the shareholder gains from going private transactions arise from a zero sum game with incumbent stakeholders whose wealth is

being expropriated (e.g. Shleifer and Summers, 1988). This could mean that companies with high debt-to-equity ratios are more likely to go private because a substantial part of the cost is paid by increasing risk among pre-transaction incumbent debtholders (e.g. Marais, Schipper and Smith, 1989, for the case of bondholders). Moreover, the widespread use of (post-transaction) debt in these transactions also expropriates the government through lower taxes (Kaplan, 1989b). The incumbent shareholders may also be expropriated by the incumbent management (Lowenstein, 1985; Harlow and Howe, 1993) or controlling owners: Low dividends and low reported earnings per share could signal that managers or controlling owners try to depress prices prior to delisting.

As previously mentioned our focus is on whether market valuations or misvaluations (the behavioural theory) also affect the going private frequency. The behavioural view has not been applied specifically to going private transactions. However, the application seems straightforward. Going private transactions can also be influenced by under/overvaluation of a company's shares relative to fundamentals. High stock prices relative to fundamentals mean that it is more expensive to take a company private (Palepu, 1986) and so one would expect that companies with high market-to-book values are less likely to go private. The same results may emerge from neoclassical theory since correctly highly valued companies have better growth prospects and may therefore find it profitable to remain listed to finance further expansion.
The theory by Rhodes-Kropf and Viswanathan (2004) can be directly applied to going private transactions. We should not expect these transactions to be driven by market misvaluations since the incumbent owners are normally paid in cash in such deals. Moreover, according to the view of Shleifer and Vishny (2003) we expect that managers are rationale, hence, indicating that both incumbent managers and buyout fund managers are able to assess the real value of the target, i.e. not being influenced by market valuations.

Other studies also seem to support these arguments. For instance Bargeron et al. (2007) found that private bidders pay less for targets than public acquirers do. In addition, Jensen (2007) argues that one of the key talents of private equity buyout fund managers

is their knowledge of what will be valued (of firm assets) and how by the capital markets.

We therefore argue that average market values at the country or industry level are less likely to influence going private transactions. First, private non-corporate buyers are not listed entities (although some private equity funds are now preparing to go public) and so their assets or implied costs of capital will not be influenced to the same extent by fluctuations in market values. Hence, incumbent managers or PE funds do not have the advantage of using own stocks as part of the financing of acquisitions. It could also be argued that private buyers are more focused on future value creations perspectives that current (market) valuation. For instance, because of concentrated ownership and/or incentive schemes they may be more focused on value creation than the managers of listed companies (maybe more focused on shareholder value). Finally, private buyers are less likely to be motivated by a (perceived) need to pre-empt competitors in bidding for acquisition targets. They can afford to participate only if they believe that the individual transaction will create value without having to take into consideration repercussions on incumbent businesses. In this sense, therefore, private buyers may be smart investors compared to companies or at least it seems like going private transactions are less driven by misvaluation.

3. The data

3.1. Data sources

Our dataset (from Thomson Financial and Worldscope) consists of all listed European companies over the period 1995-2005, including both companies that are listed in any given year and companies that are not, but were listed at some point during the period. We do not have full coverage, for example we miss data from countries like Iceland, Switzerland, Russia and other members of the former Soviet Union, but we do have a fairly comprehensive sample.[64]

[64] The data consist of information from the following 21 countries: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden and United Kingdom.

Since we would like to analyze changes in the population and their determinants we loose one year (1995). To ensure completeness of the dataset we also drop 2005 from the sample to avoid registering a delisted company as listed because it reports late in the year. The observation period 1996-2004 both contains bull and bear years, e.g. the stock market bubble of the 1990s, the decline 2000-2003 and the partial recovery in 2004-2005.

Based on the information from Thomson Financial/Worldscope we can distinguish between five types of delisting - merger, acquisition, bankruptcy, liquidation or going private. The cause of delisting is classified as merger if a firm is delisted because of merger with another firm. A firm is denoted as acquired if it is taken over by another firm. In M&A it is the target firms which become delisted. Going private firms are categorized as such if they are taken over and delisted by a private non-corporate buyer, for instance an individual or a private equity fund. Finally, we have direct information on whether a firm delists due to bankruptcy or liquidation. This key firm status variable published by Thomson Financial is based on their own research on company filings, press releases and other news available. A potential problem with this classification is overlap between groups due to misspecifications. For example it may be difficult to distinguish between an acquisition and a going private transaction in private equity buyouts where private equity funds set up a holding company (controlled by the fund) which buys the target firm. We checked for this and other measurement problems where we have secondary information and found very few misspecifications in which going private firms were grouped as acquired. In the present study we combine the 5 different types of delisting into 3 main groups: merger and acquisition, going private and bankruptcy/liquidation. Since our focus is on M&A and going private only these results will be reported for simplification. We do not have access to detailed information about buyers and so we cannot distinguish between private equity funds and incumbent blockholders in going private transactions or between foreign and domestic acquirers in M&A transactions.

We have yearly observations of the standard accounting and market variables, for example company size in terms of assets or turnover, market value, return on assets (ROA), debt, cash flow, sales growth, ownership concentration, main industry[65], country of origin etc. as well as the nature of the delisting (merger, acquisition, going private transaction, liquidation or bankruptcy). We correct for extreme observations by truncation (e.g. ROA < -100% is registered as ROA = -100%). By country of incorporation we link to country information on the aggregate volume of private equity investments from Deloitte (2005) and country-specific interest rates.

The firm-specific value ($q_{i,t}$) is defined as the ratio between (annual) market value plus book value of total debt to book value of total assets (a proxy for the replacement value of the assets). According to Perfect and Wiles (1994) this q measure is a too simplified proxy, however, the proxy used here is however applied in related studies.
Different key variables are constructed for further analysis using the firm-specific value. Yearly country equally weighted averages of firm-specific q's are calculated similar to other studies (Rhodes-Kropf and Viswanathan, 2004; Harford, 2005; Dong et al., 2006; Ang and Chen, 2007) – this variable is denoted $q\text{-}country_{j,t}$. Similarly, using the SIC-codes industry and yearly equally weighted averages are constructed - this variable is denoted $q\text{-}industry_{k,t}$. Further, we define a q-industry dispersion variable as the annual (equally weighted) standard deviation of $q_{i,t}$ across firms in an industry. Finally, we create an "overvaluation" variable which is the difference between firm-specific $q_{i,t}$ and $q\text{-}industry_{k,t}$. We did similar calculations using price to earnings ratios and comment on them throughout the paper, but report only q-valuations in this paper.

These different q measures are used as proxies for different elements of misvaluations in the analysis. However are these q measures able to indicate whether a firm is misvalued? We can not be certain that such simplified measures completely captures whether companies are valued too high or low, however, by definition it does gives us an idea about how a firm is valued relatively to its fundamental value (replacement cost or total assets). In particular we employ q measures at the firm, industry and market-level and hereby we investigate different kinds of relative overvaluations or

[65] The Standard Industrial Classification (SIC) codes.

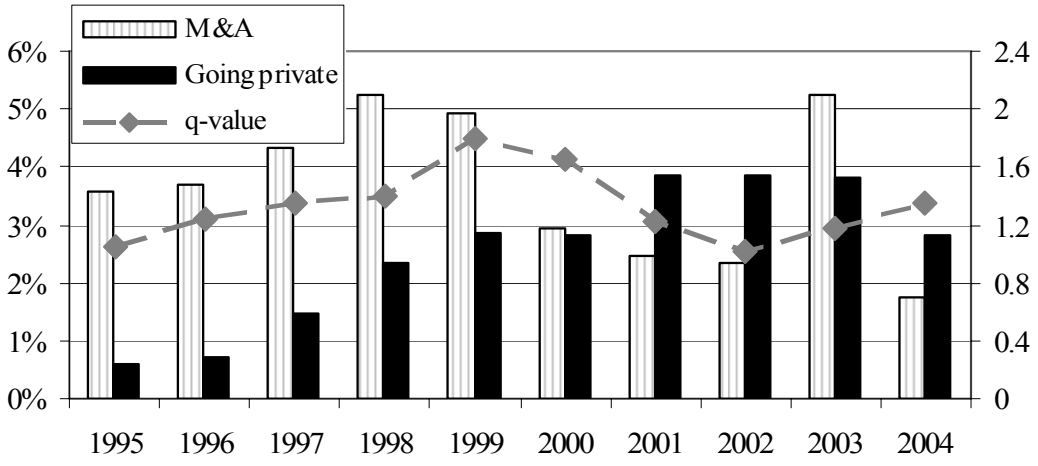
undervaluations. Moreover, we acknowledge that firm valuation is not the only driver of takeovers which is why we control for other firm and market characteristics in our analysis.

3.2. Descriptive Statistics

The first major finding in this data set is the magnitude of the changes. We register a total of 12612 companies listed at European exchanges during the period, of which an astounding 30 percent have been delisted. In market values this corresponds to approximately $3.7 trillion or 40 percent of total market value. Obviously firm dynamics are very important, and the studies which abstract from them by balanced panels or cross sections miss an important part of economic reality.

For an overview figure 1 shows M&A and going private frequencies along with annual *q* averages over the period 1995-2004.

Figure 1: M&A and Going private frequencies vs. q-value



We observe that M&A transactions peaked in 1998-1999 when q-values were high, but declined in 2000-2002 along with average q only to increase again and 2003 when the market recovered and q-values began to increase. In short, M&A appears to be pro-

cyclical and positively related to q-values. In comparison going private transactions have been steadily increasing up to 2003 and were particularly frequent during the bear market in 2001-2002. If anything going private transactions appear to be countercyclical even taking into consideration an increasing trend reflecting the emergence of private equity funds in Europe. If we regress M&A on average q we find a significant positive effect, while there is no similar effect on going private frequency.

To be sure, average – pan-European – q is a crude measure. It may be preferable to use country or industry q or deviations from these averages. In the following we use these more detailed measures for statistical analysis.

Table 1 shows descriptive statistics by type of delisting. We observe that both for going private transactions and M&A firm-specific $q_{i,t}$ is generally lower than sample average and the average value of the firms which remain listed. Apparently both private buyers and companies are economical in the sense that they prefer to buy relatively cheap companies. There is no significant difference between private buyers and companies in this respect. But q-country for M&A is larger than the total average and the average of remaining listed firms (in accordance with studies by Shleifer and Vishny, 2003; Rhodes-Kropf and Viswanathan, 2004 on US data), and it is also significantly larger than for going private transactions. Furthermore, q-industry for M&A deals is also significantly higher than for going private transactions. As noted, these differences may be attributable to a positive effect of higher valuation ratios on the demand for acquisitions among listed acquiring firms. Following Shleifer and Vishny (2003) listed acquirers may finance M&A by paying part of the deal using their own stock, and this type of financing is of course more favourable in high valuation periods. Alternatively, a positive market sentiment (high average q-country) may induce more M&A because acquiring companies have lower costs of capital or believe to have better growth prospects, while high average q leads to fewer going private transactions because it seems more expensive to buy listed companies in good times.

Table 1
Descriptive statistics

Variable explanations: Firm-specific value, q, is defined as market value plus total debt to total assets. q-country average is yearly country averages of all the firm-specific q's. q-industry average is yearly industry averages of all the firm-specific q's. Stock liquidity is measured as annual country averages of the ratio between common shares traded relatively to common shares outstanding. Private equity investment ratio is the ratio between total private equity investments (Deloitte, 2005) and stock market value by year and country. Number of observations and standard deviations are reported in brackets. Standard errors are reported below the difference between the means of the M&A and going private sample. ***, **, * indicate statistical significance at 1%, 5% and 10% respectively.

	Overall average	*Remaining Listed*	*M&A*	*Going private*	*Difference between M&A and GP*
q-firm specific	1.334	1.354	1.106	1.107	0.000
	[55320]	[50665]	[1961]	[1312]	0.042
	[1.498]	[1.526]	[1.083]	[1.276]	
q-country average	1.343	1.340	1.408	1.271	0.137 ***
	[65454]	[53798]	[1979]	[1326]	0.013
	[0.401]	[0.415]	[0.404]	[0.369]	
q-industry average	1.418	1.361	1.344	1.285	0.059 ***
	[65454]	[53798]	[1979]	[1326]	0.018
	[0.732]	[0.573]	[0.543]	[0.532]	
Debt to assets	0.218	0.215	0.220	0.260	-0.040 ***
	[61586]	[53252]	[1972]	[1316]	0.789
	[0.204]	[0.201]	[0.199]	[0.252]	
Log of assets	5.15	5.11	5.70	4.55	1.14 ***
	[64880]	[53477]	[1978]	[1324]	0.07
	[2.42]	[2.37]	[2.21]	[1.95]	
Dividend payout ratio	0.235	0.239	0.279	0.162	0.117 ***
	[50117]	[43852]	[1558]	[1019]	0.011
	[0.269]	[0.268]	[0.264]	[0.259]	
Stock liquidity	0.289	0.286	0.309	0.248	0.061 ***
	[61441]	[50385]	[1918]	[1227]	0.007
	[0.222]	[0.223]	[0.217]	[0.193]	
Return on assets	2.1	2.2	3.5	-3.9	7.4 ***
	[56690]	[49631]	[1935]	[1269]	0.8
	[23.7]	[23.9]	[16.9]	[25.5]	
Interest rate	5.34	5.32	5.35	5.07	0.28 ***
	[64194]	[52664]	[1966]	[1292]	0.04
	[1.38]	[1.40]	[1.20]	[1.14]	
Private equity investment ratio	0.633	0.629	0.644	0.639	0.005
	61364	50071	1914	1235	0.01
	[0.381]	[0.388]	[0.335]	[0.399]	
Cash flow to sales	7.10	7.19	8.81	0.92	7.89 ***
	[60380]	[52206]	[1939]	[1274]	1.12
	[30.90]	[30.99]	[25.93]	[37.88]	

In terms of size (log accounting total assets), M&A targets are typically larger than firms that continue to be listed which is a surprise since size has historically been regarded as a takeover deterrent. Firm size could have a negative effect on the likelihood of becoming a target for merger or acquisition, if it is easier to finance small

transactions and if acquisition costs are smaller for small firms (Dietrich and Sorensen, 1984). However, fixed transaction costs of acquisition imply that unit costs are lower when large firms are acquired. In fact the merger activities in the 1980s compared to those of other periods were mainly characterized by the large size of targets (Barnes, 2000). In contrast firms that go private are typically smaller than the firms that remain listed and significantly smaller than M&A.

In terms of capital structure, firms going private have higher debt-to-assets ratios than firms that continue as listed. One argument from existing research is that the shareholder gains from going private transactions arise from a zero sum game with incumbent stakeholders whose wealth is being expropriated (e.g. Shleifer and Summers, 1988). This could mean that companies with high debt-to-equity ratios are more likely to go private because a substantial part of the cost is paid by increasing risk among incumbent debtholders (e.g. Marais, Schipper and Smith, 1989, for the case of bondholders). On contrary, one might expect that debt ratios should be lower in going private transactions. The reasoning is that it is easier for acquirers (e.g. a buyout fund) to the finance the deal if the pre-buyout target firm debt is low. However, on average this does not seem to be the case. Financial leverage is also important according to the failing firms' hypothesis which regards merger or acquisition as a civilized alternative to bankruptcy (Dewey, 1961). Leverage (loss of equity due to past bad performance) may also signal inefficient management. Nuttal (1999) finds that avoiding bankruptcy or financial distress is an important motive to sell. Our results are more consistent with expropriation of existing debtors than with efficiency gains of post transaction leveraging. The average debt ratio is significantly lower for M&A firms compared to going private firms and is closer to the average for listed firms. There is also a substantial literature on equity market timing and capital structure (e.g. Alti, 2006; Baker and Wurgler, 2002). We attempt to control for this effect later in our econometric specification.

Accounting profitability tends to be higher among merged and acquired firms than among firms that remain listed, but significantly lower for firms going private compared to M&A firms. In other words, the failing firm hypothesis (Dewey, 1961) is

more convincing for going private transactions than for M&A. Following Jensen (1986) it may be easier to restructure companies which are privately held. Surprisingly, firms going private tend to have negative ROA[66] on average. Apparently firms that go private tend to be low performers. Alternatively, accounting profitability may be manipulated by insiders to make companies cheaper which would then indicate expropriation of minority investors.

The dividend payout ratio is considerably lower in firms that subsequently go private than in firms which are delisted by M&A or stay listed. This is probably attributable to relatively bad performance. Alternatively, going private may be a particularly appropriate solution to agency problems in companies with substantial free cash flow (Jensen, 1986) which is not paid out as dividends. The incumbent shareholders may also be expropriated by the incumbent management (Lowenstein, 1985; Harlow and Howe, 1993) or controlling owners: Low dividends and low reported earnings per share could signal that managers or controlling owners try to depress prices prior to delisting.

The cash flow to sales ratio differs greatly. This ratio is defined as funds from operations to net sales. Cash flows are considerably larger for M&A than for going private transactions. Moreover, cash flows within M&A firms are larger than for listed firms. This measure therefore provides no evidence of the free cash flow argument for public-to-private transactions (Jensen, 1986, 1989).

In addition to the firm specific variables we include a number of country variables to capture the impact of country differences. We use average market liquidity as an indicator of trends in liquidity, since there the firm level information is relatively scarce. More specific stock liquidity is measured as the annual number of stocks traded compared to number of stocks outstanding within a country. Stock market liquidity tends to be high for merged or acquired companies, but low for firms going private, if we compare to firms that remain listed. Stock liquidity may be an important driver of delistings as emphasized by Bharath and Dittmar (2006). If a stock is not liquid (easily tradeable), it may be priced at a discount, which implies lower advantages of being

[66] ROA is defined as netincome before preferred dividends plus interest expense on debt-interest capitalized after taxes relatively to last year's total assets.

listed. This could imply that companies with more concentrated ownership (less free float), less traded stocks and operating in less liquid national stock markets will be more inclined to go private.

The country-specific interest rates seem to be greater within M&A than for going private deals. This is consistent with substitution of debt for equity leverage as a motive for taking companies private. We therefore control for this trend effect that low interest rates are favourable for leverage buyouts (part of going private transactions).

We also include the annual (country-specific) volume of private equity investment (Deloitte, 2005) relative to stock market capitalization to be able to control for the growing trend in European going private transactions, which may be spuriously correlated with stock market fluctuations. There is a possibility of a time trend in delistings. However, we do believe that this measure of private equity investment volume captures the main time trend in this time series. Since the surge of private equity investment post 2000 was partly motivated by low equity prices, this involves some risk of over-controlling.

Summing up, companies being delisted by merger or acquisition are attractive in the sense that they tend to be larger and have higher accounting returns than both firms that remain listed and firms that exit due to a going private transaction. In contrast, the firms going private are relatively unattractive measured on the same variables. Further, going private firms are also having a significantly higher debt-to-assets ratio in the delisting year.

4. Results

4.1. Market timing, market valuation and its impact on delistings

We begin by estimating determinants of overall delisting using logistic regression and determinants of delisting by type using multinomial logistic regression while taking into consideration clustering of residuals by firm. We estimate the probability of delisting in year *t* relative to remaining listed (or more precisely the log odds ratio) as a

function of a set of explanatory variables measured in the year prior to delisting (year *t-1*). We control for fixed industry effects[67] and for fixed country effects. We also control for time trend by controlling for the annual volume of private equity investment ratio which we believe captures general trends in the going private market.

We find that a higher level firm-specific valuation (q_{it}) is associated with fewer delistings (model 1), both by M&A and going private transactions (model 2, 3, 4 and 5). This result is consistent with the undervaluation explanation (low market-to-book or price-earnings ratio), i.e. that low values partly reflect undervaluation which makes companies more attractive acquisition targets (Dietrich and Sorensen, 1984; Palepu, 1986; Cudd and Duggal, 2000; Shleifer and Vishny, 2003; Rhodes-Kropf and Viswanathan, 2004). However, if we use price-earnings ratio to measure firm value, the results are weaker and often insignificant. Numerically, the odds of M&A and going private both fall by approximately 20 percent when the firm-specific valuation (q_{it}) increases by one unit.

Furthermore, high market valuation (q country average) appears to lead to more delistings in general, and to more M&A but fewer going private transactions. To the extent that listed companies are taken over by other listed firms in the same country our evidence is therefore consistent with greater sensitivity to stock market fluctuations and larger agency problems among corporate buyers. A higher sensitivity to market fluctuations could also occur if market valuations reflect changes in operating profitability and companies prefer to finance acquisitions by retained earnings (Myers and Majluf, 1984). But we control for cash flow, accounting returns and dividend pay-out ratios which make this explanation less likely. In terms of magnitude the odds of M&A go up by approximately 60 percent when the market valuation (q country average) increases by one unit.

In contrast, going private transactions are not significant affected by market valuation when controls are applied (model 3 and 5), which is consistent with the hypothesis that we proposed. In addition to the differences in corporate governance which we

[67] We have information of the firms' main industry (SIC codes) affiliation from which we aggregate industry affiliation to 25 different industry groups.

mentioned previously one explanation in the behavioural vein could be that private buyers cannot use their own 'overvalued' stock as payment (Shleifer and Vishny, 2003). If we use country price-earnings values instead of country q, we find similar results.

Industry dispersion (the standard deviation of firm-specific q values by industry) is known as a proxy for the neoclassical argument that technological change can lead to differences in efficiency within industries which then create scope for restructuring by M&A (Gort, 1969; Mitchell and Mulherin, 1996; Andrade, Mitchell and Stafford, 2001; Jovanovic and Rousseau, 2002a, 2002b). In accordance with the literature we find (model 4) that industry dispersion in firm valuation has a weakly significant positive impact on the likelihood of M&A (at the 10 percent significance level). However, when country q is included in the regression (model 5) the effect on M&A becomes insignificant. In contrast, going private transactions are significantly *negatively* affected by industry q dispersion, suggesting that the neoclassical industry restructuring argument does not explain going private transactions (model 4 and 5). An alternative explanation is that private equity firms and other private buyers regard industry q dispersion as a source of uncertainty/risk, which makes them less likely to buy. Since going private transactions involves concentrated ownership, it seems likely that private buyers are more risk adverse than listed companies.

As for the control variables we find that firms are more likely to delist (regardless of type) if they have a high debt ratio, low profitability, low dividend payouts, low liquidity (i.e. if national stock market liquidity is low) and low national interest rates. Harford (2005) also finds that capital liquidity is positively correlated with M&A. There are also interesting differences between types of delistings. Companies going private are smaller, more leveraged, less profitable, have lower dividend ratio and tend to be listed in markets with lower liquidity than merged or acquired companies. Furthermore, the level of going private transactions is positively affected by lower interest rates and larger private equity investments. This is not surprising since many going private transactions are financed by debt.

Table 2

Determinants of delisting - 1

(1) is a logit regression where the response variable is delisting. (2)-(4) are multinomial logit regressions where the response variable outcomes (delisted) are either due to a merger or acquisition, or going private transaction (or bankruptcy and liquidation). *Variable explanations:* Firm-specific value, q , is defined as market value plus total debt to total assets. *q-country average* is yearly country averages of all the firm-specific q's. *q-industry dispersion* is the standard deviation of q per year and industry. Stock liquidity is measured as annual country averages of the ratio between common shares traded relatively to common shares outstanding. Private equity investment ratio is the ratio between total private equity investments (Deloitte, 2005) and stock market value by year and country. Robust standard errors are reported below parameter estimates. ***, **, * indicate statistical significance at 1%, 5% and 10% respectively.

	(1)	*(2)*		*(3)*		*(4)*		*(5)*	
Dependent variables /		*Delisting by:*		*Delisting by:*		*Delisting by:*		*Delisting by:*	
Explanatory variables	*Delisted*	*M&A*	*Going private*	*M&A*	*Going private*	*M&A*	*Going private*	*M&A*	*Going private*
q-firm specific	**-0.168** ***	**-0.214** ***	**-0.121** ***	**-0.191** ***	**-0.188** ***	**-0.174** ***	**-0.182** ***	**-0.191** ***	**-0.190** ***
	0.025	**0.025**	**0.032**	**0.033**	**0.042**	**0.032**	**0.041**	**0.033**	**0.042**
q-country average	**0.296** ***	**0.523** ***	**-0.354** ***	**0.497** ***	**0.141**			**0.475** ***	**0.252**
	0.086	**0.041**	**0.087**	**0.107**	**0.151**			**0.109**	**0.155**
q-industry dispersion						**0.001** *	**-0.002** ***	**0.001**	**-0.003** ***
						0.001	**0.001**	**0.001**	**0.001**
Debt to assets	0.006 ***			0.001	0.012 ***	0.001	0.012 ***	0.001	0.012 ***
	0.001			0.002	0.002	0.002	0.002	0.002	0.002
Log of assets	-0.017			0.079 ***	-0.170 ***	0.079 ***	-0.167 ***	0.079 ***	-0.167 ***
	0.011			0.013	0.019	0.013	0.019	0.013	0.019
Dividend payout ratio	-0.022 **			0.000	-0.006 ***	0.000	-0.006 ***	0.000	-0.006 ***
	0.001			0.001	0.002	0.001	0.002	0.001	0.002
Stock liquidity	-0.327 **			0.253	-1.132 ***	0.220	-1.050 ***	0.252	-1.089 ***
	0.145			0.179	0.268	0.172	0.256	0.179	0.266
Return on assets	-0.004 ***			0.003 **	-0.009 ***	0.003 ***	-0.009 ***	0.003 **	-0.009 ***
	0.001			0.001	0.002	0.001	0.002	0.001	0.002
Interest rate	-0.065 ***			0.012	-0.264 ***	-0.016	-0.235 ***	0.004	-0.234 ***
	0.022			0.027	0.039	0.026	0.040	0.028	0.040
Private equity investment ratio	5.943			-4.652	21.107 **	-8.779	19.274 **	-4.675	21.416 **
	6.476			9.438	9.311	9.737	9.214	9.473	9.320
Cash flow to sales	0.000			0.000	0.000	0.000	0.000	0.000	0.000
	0.001			0.001	0.002	0.001	0.001	0.001	0.002
Country dummies	YES	NO	NO	YES	YES	YES	YES	YES	YES
Industry dummies	YES	NO	NO	YES	YES	YES	YES	YES	YES
Observations (firm-year)	37247	37247		37247		37246		37246	
Log pseudolikelihood	-8608.5	-15386.6		-10153.1		-10157.7		-10147.4	
Pseudo R2	0.020	0.007		0.048		0.048		0.048	

In table 3 we investigate whether delistings are mainly driven by *country q* or *industry q*. Model 1 in table 3 suggests that high market industry valuation leads to significantly more M&A but has no significant effect on going private transactions. In model 2 we combine model 3 from table 2 and model 1 from table 3. Industry q tends to dominate country q, which becomes insignificant when we include industry q so we find that higher industry q leads to more M&A. This also holds for p/e values. In comparison going private transactions appear not to be influenced by industry q – and industy p/e is found to have a significantly negative effect. The positive industry effects on M&A may be attributable to good growth prospects in the industry which could make it more profitable to invest. Alternatively, in the case of horizontal M&A, overvalued equity may be a cheap way to finance acquisitions (Shleifer and Vishny, 2003). The odds of M&A go up by approximately 40 percent when the industry market valuation (q industry average) increases by one unit.

There can be several reasons why industry q tends to dominate country q. Much M&A in Europe is intra European cross-border transactions in which case the bidder are presumably less effected by valuations in the target nation. Alternatively high industry q may be a better expression of growth or restructuring opportunities in the target company.

In model 3 it is examined whether deviation in firm value from the industry average explains the decision to delist. We find that larger deviation from industry average increases the frequency of both M&A and going private transactions. The effect is slightly stronger for M&A transactions which may be driven partly by horizontal M&A.

Table 3
Determinants of delisting - II

(1)-(3) are multinomial logit regressions where the response variable outcomes (delisted) are either due to a merger or acquisition, or going private transaction (or bankruptcy and liquidation). *Variable explanations:* Firm-specific value, q, is defined as market value plus total debt to total assets. q-country average is yearly country averages of all the firm-specific q's. q-industry average is yearly industry averages of all the firm-specific q's. *q-q_industry* is the difference between firm-specific q and industry q. Stock liquidity is measured as annual country averages of the ratio between common shares traded relatively to common shares outstanding. Private equity investment ratio is the ratio between total private equity investments (Deloitte, 2005) and stock market value by year and country. Robust standard errors are reported below parameter estimates. ***, **, * indicate statistical significance at 1%, 5% and 10% respectively.

	(1)		*(2)*		*(3)*	
Dependent variables / Explanatory variables	*Delisting by:*		*Delisting by:*		*Delisting by:*	
	M&A	*Going private*	*M&A*	*Going private*	*M&A*	*Going private*
q-firm specific	**-0.203** ***	**-0.187** ***	**-0.204** ***	**-0.187** ***		
	0.033	**0.043**	**0.033**	**0.043**		
q-country average			**0.208**	**0.148**		
			0.135	**0.186**		
q-industry average	**0.438** ***	**0.059**	**0.347** ***	**-0.009**		
	0.077	**0.114**	**0.098**	**0.141**		
q-q_industry					**-0.223** ***	**-0.181** ***
					0.035	**0.041**
Debt to assets	0.001	0.012 ***	0.001	0.012 ***	0.001	0.012 ***
	0.002	0.002	0.002	0.002	0.002	0.002
Log of assets	0.078 ***	-0.169 ***	0.078 ***	-0.170 ***	0.077 ***	-0.169 ***
	0.013	0.019	0.013	0.019	0.013	0.019
Dividend payout ratio	0.000	-0.006 ***	0.000	-0.006 ***	0.000	-0.006 ***
	0.001	0.002	0.001	0.002	0.001	0.002
Stock liquidity	0.191	-1.123 ***	0.212	-1.130 ***	0.204	-1.169 ***
	0.177	0.266	0.179	0.269	0.174	0.270
Return on assets	0.002 **	-0.009 ***	0.002 **	-0.009 ***	0.003 **	-0.009 ***
	0.001	0.002	0.001	0.002	0.001	0.002
Interest rate	-0.002	-0.265 ***	0.004	-0.263 ***	-0.002	-0.272 ***
	0.027	0.039	0.027	0.039	0.026	0.039
Private equity investment ratio	-6.817	20.202 **	-5.393	21.117 **	-8.144	20.951 **
	9.796	9.257	9.708	9.298	9.745	9.220
Cash flow to sales	0.000	0.000	0.000	0.000	0.000	0.000
	0.001	0.002	0.001	0.002	0.001	0.002
Country dummies	YES	YES	YES	YES	YES	YES
Industry dummies	YES	YES	YES	YES	YES	YES
Observations (firm-year)	37247		37247		37247	
Log pseudolikelihood	-10148.1		-10146.4		-10153.4	
Pseudo R2	0.049		0.049		0.048	

4.2. Interactions with industry and size

Table 4 shows three different models where we evaluate the degree of misvaluation error measured on different subgroups: firm size and different industry segments. The idea is to test whether the behavioural misvaluation hypothesis applies more to certain types of firms and industries in which misvaluation is presumably more or less likely.

Model 1 distinguishes between large and small firms. The hypothesis is that there is less noise in the pricing of large companies, since they have more liquid stocks and are

followed by more analysts. Observed fluctuations in large company stocks are therefore more likely to reflect fluctuations in fundamental values and less likely to be caused by misvaluations. Our somewhat arbitrary definition of a large firm is that total assets are above $1 billion in the exit year.[68] The group of large firms contains of approximately 20 percent of the firms in the entire sample. Furthermore, almost 30 percent of the delisted firms are in the large firm sample. The results indicate that the valuation sensitivity is insignificant for large firms, but significant for small firms. As robustness checks we run regressions for other size measures (sales and number of employees) and obtain similar results. This seems to support our hypothesis that large firms are easier to evaluate and therefore the corporate buyers do not experience misvaluation errors among these, i.e. the behavioural hypothesis is not supported for large firms. We still get our main result that non-corporate buyers are not driven by misvaluation errors in neither large nor small firms.

Next, we examine differences between non-financial and financial firms (model 2). Here the hypothesis is that the stock market valuation of financial firms is more accurate (and misvaluation smaller) because the accounting assets of financial firms (which consist to a larger extent of financial assets evaluated at current market values) are closer to fundamental values. We define financial firms as firms which belong to the SIC-codes of financial and insurance industry (approximately 10 percent of the sample). We find that industry q has a significant effect on the likelihood of M&A among non-financial firms where there are presumably more errors in market valuation. The hypothesis is thus supported since M&A among financial firms does not seem to be exposed to valuation errors. Again we find our strong result of no misvaluation errors within going private transactions.

[68] Note, that the median of total assets in the data is $135 millions while the mean is $5792 millions.

Table 4

Determinants of delistings - interactions with industry and size

(1)-(6) are multinomial logit regressions where the response variable outcomes (delisted) are either due to a merger or acquisition, or going private transaction (or bankruptcy and liquidation). *Variable explanations:* Firm-specific value, q, is defined as market value plus total debt to total assets. q-country average is yearly country averages of all the firm-specific q's. q-industry average is yearly industry averages of all the firm-specific q's. Stock liquidity is measured as annual country averages of the ratio between common shares traded relatively to common shares outstanding. Private equity investment ratio is the ratio between total private equity investments (Deloitte, 2005) and stock market value by year and country.

We divide firms in 2 groups: large and small firms using total assets. Firms are characterized as large firm if their total assets exceeds $1 billion. The large firm sample accounts for approximately 20% of the sample and almost 30% of the delisted firm sample. Firms are categorized as being a financial firm if it belongs to a financial or insurance industry using SIC-codes. We exclude real estate firms. R&D intensity is defined as R&D investments relatively to value-added sales. High R&D firms are defined as having a R&D intensity above the mean(2.4%). Robust standard errors are reported below parameter estimates. ***, **, * indicate statistical significance at 1%, 5% and 10% respectively.

	(1)		*(2)*		*(3)*		*(4)*		*(5)*		*(6)*	
	Firm size				***Financial vs. non-financial firms***				***R&D intensity***			
	Large firms		*Small firms*		*Financial*		*Non-financial*		*High*		*Low*	
	Delisting by:		*Delisting by:*		*Delisting by:*		*Delisting by:*		*Delisting by:*		*Delisting by:*	
Dependent variables / Explanatory variables	*M&A*	*Going private*	*M&A*	*Going private*	*M&A*	*Going private*	*M&A*	*Going private*	*M&A*	*Going private*	*M&A*	*Going private*
q-firm specific	**-0.154** *	**-0.284**	**-0.201** ***	**-0.170** ***	**-0.112**	**0.029**	**-0.211** ***	**-0.202** ***	**-0.207** ***	**-0.207** ***	**-0.212** ***	**-0.183** ***
	0.087	**0.177**	**0.035**	**0.043**	**0.172**	**0.182**	**0.034**	**0.044**	**0.055**	**0.080**	**0.042**	**0.051**
q-country average	**0.272**	**0.066**	**0.210**	**0.195**	**0.138**	**-1.671**	**0.136**	**0.208**	**0.428**	**0.316**	**0.131**	**0.103**
	0.254	**0.468**	**0.160**	**0.204**	**0.751**	**1.110**	**0.143**	**0.193**	**0.286**	**0.404**	**0.154**	**0.211**
q-industry average	**-0.026**	**-0.803**	**0.388** ***	**0.025**	**2.100**	**3.450**	**0.368** ***	**-0.024**	**0.246**	**-0.185**	**0.382** ***	**0.056**
	0.267	**0.599**	**0.107**	**0.147**	**1.973**	**2.724**	**0.099**	**0.143**	**0.214**	**0.283**	**0.111**	**0.166**
Debt to assets	-0.002	0.008	0.001	0.012 ***	0.003	0.008	0.000	0.012 ***	-0.004	0.007 *	0.001	0.013 ***
	0.003	0.006	0.002	0.002	0.004	0.006	0.002	0.002	0.004	0.004	0.002	0.002
Log of assets	-0.063	-0.579 ***	0.164 ***	-0.112 ***	0.076 **	-0.197 ***	0.052 ***	-0.162 ***	0.086 ***	-0.164 ***	0.076 ***	-0.171 ***
	0.043	0.102	0.025	0.029	0.036	0.073	0.015	0.021	0.027	0.040	0.016	0.022
Dividend payout ratio	0.001	-0.004 ***	-0.001	-0.006 ***	0.011 ***	0.000	-0.001	-0.006 ***	-0.002	-0.009 **	0.000	-0.005 **
	0.002	0.005	0.001	0.002	0.004	0.008	0.001	0.002	0.003	0.004	0.001	0.002
Stock liquidity	0.225	-0.262	0.224	-1.361 ***	-0.151	-0.193	0.223	-1.244 ***	0.328	-0.962 **	0.181	-1.196 ***
	0.352	0.630	0.212	0.299	0.647	0.991	0.188	0.275	0.328	0.471	0.214	0.325
Return on assets	0.010	-0.030 ***	0.001	-0.009 ***	-0.005	-0.002	0.002 **	-0.010 ***	0.002	-0.009 *	0.002 **	-0.009 ***
	0.008	0.010	0.001	0.002	0.008	0.007	0.001	0.002	0.003	0.006	0.001	0.002
Interest rate	-0.110 **	-0.309 ***	0.030	-0.268 ***	0.148 *	-0.306 **	-0.018	-0.265 ***	-0.016	-0.349 ***	0.004	-0.240 ***
	0.054	0.094	0.032	0.043	0.080	0.141	0.029	0.041	0.055	0.084	0.031	0.044
Private equity investment ratio	21.560	59.531 ***	-19.373	12.260	11.213	81.256 *	-10.185	16.988 *	-21.355	15.809	-2.707	23.564 **
	14.972	21.408	13.844	10.774	22.810	45.416	10.737	9.656	22.000	27.318	10.379	9.926
Cash flow to sales	-0.008 **	0.002	0.000	0.000	-0.007	-0.004	0.001	0.001	0.001	0.000	0.000	0.000
	0.003	0.006	0.001	0.002	0.006	0.006	0.001	0.002	0.003	0.004	0.001	0.002
Country dummies	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Industry dummies	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations (firm-year)	8100		29147		3026		34221		9399		27848	
Log pseudolikelihood	-1948.5		-8069.5		-780.6		-9300.3		-2439.4		-7669.5	
Pseudo R2	0.062		0.056		0.079		0.052		0.071		0.046	

Finally, we distinguish between industries with high and low R&D intensities (model 3) on the hypothesis that high R&D industries are more opaque and therefore more likely to suffer from valuation errors (Zeckhouser and Pound, 1990). We have industry-level information of R&D intensity which is defined as R&D investments relatively to value-added sales. A firm is defined as belonging to the high R&D group if the R&D intensity in its industry is above the total average in the delisting year. Companies in this group are presumably more difficult for outside investors to evaluate, and industry valuation error is therefore more likely. Approximately 25 percent of both listed and delisted firms are thus categorized as high R&D firms. However, industry q does not affect either the M&A or going private transaction among high R&D firms. Contrary to the hypothesis we observe that higher industry q only leads to relatively more M&A transactions in low R&D industries where valuation errors are relatively small. We find somewhat similar results if we instead use the median or the 75%-fractile as the boundary.

Altogether it seems like going private transactions are not driven by valuation errors, whereas M&A was to a larger extent driven by valuation errors. The industry value effect is stronger for small firms and non-financial firms where valuation error is presumably larger. To be sure these findings may be attributable to other factors which we have not controlled for. For example it may be more difficult and risky to take large companies private compared to organizing a merger with another listed company, and this might explain why we see no industry value effect on M&A among large firms. Finally, it may be difficult for corporate buyers to raise capital to finance acquisitions in very opaque industries (with high R&D ratios), and company managers may therefore be unable to benefit from overvaluation by acquiring other companies. But the same may apply to the one finding which supports the behavioural M&A hypothesis. It may be that the potential for taking financial companies private is effectively limited by financial regulation and that this – rather than a smaller valuation error - is why firm value is a less important determinant of delisting type in the finance industry.[69]

[69] We also run logit regressions (not reported) where it is evaluated how specific industry affiliation affects whether a firm is delisted due to a going private transaction or M&A (here M&A is the base outcome). The data suggest that the industries with the highest M&A and going private activity are the same – the industries are the following: finance, consumer durables, manufacturing, wholesale and computers, software etc. (using the 12 Fama

4.3. The timing ability of M&A vs. going private investors

As previously indicated, the ability to time acquisitions so as to profit by stock market fluctuations may be a key advantage for private buyers. Ideally private buyers would be able to buy when price are lowest while companies may (for good or bad reasons) be inclined to do their acquisitions in peak periods. In table 5 we examine this hypothesis.

Table 5
Going private and stock the market cycle
(1)-(6) are logit regressions where the response variable is defined as 0 if a firm becomes delisted due to a merger or acquisition, and 1 if a firm is delisted due to a going private transaction. Variable explanations: Peak corresponds to when the going private transaction coincides with the highest q-industry average (model 1-3) or market capitalization (MC) industry average (model 4-6) in the given period 1995-2004. Bottom is when the going private transaction coincides with the lowest q-industry and MC-industry average in the given period 1995-2004. Robust standard errors are reported below parameter estimates. ***, **, * indicate statistical significance at 1%, 5% and 10% respectively.

	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
Explanatory variables	*q-industry average*			*Market value industry average*		
Peak	**-0.248 ** **		**-0.202 * **	**-0.040**		**0.075**
	0.106		**0.106**	**0.114**		**0.115**
Bottom		**0.441 *** **	**0.414 *** **		**0.959 *** **	**0.967 *** **
		0.112	**0.112**		**0.110**	**0.111**
Observations (firm-year)	3629	3629	3629	3629	3629	3629
Log pseudolikelihood	-2465.9	-2461.1	-2459.3	-2468.7	-2430.26	-2430.06
Pseudo R2	0.001	0.003	0.004	0.000	0.016	0.016

The table investigates to what extent companies (M&A) and private buyers (going private transactions) are able to time their acquisition such that they buy during industry peaks or downturn. This is done by creating dummy variables for years in which industry q or industry (log) market capitalization reaches it maximum and minimum values over the period 1995-2004 and regressing these dummies on the probability of delisting by going private compared to delisting M&A.

Strikingly, we find that firms are more likely to delist by M&A in the peak year and more likely to delist by going private when industry q values are at the minimum. The

and French industry classifications). Significant differences are found in specific industries – since M&A occur statistical more frequently in utilities, medical and chemicals.

result is robust if the annual industry-specific market capitalization is also analyzed. Apparently, going private investors are better at buying at the right (cheap) time whereas M&A is relatively more likely when the market values are high (and perhaps overvalued). A similar result is found by Bargeron et al. (2007) who documents that acquisition premiums paid by private equity firms are significantly lower than for other types of acquirers. It also relates to the argument by Jensen (2007) that one of the key advantages of private equity buyout funds is their knowledge in understanding corporate value. Further, a related study (Schmidt et al., 2004) shows that investment timing has an impact on the performance of venture capital funds.

5. Discussion

In this paper we have examined the impact of stock market valuations on M&A and going private transactions on European stock exchanges over the period 1996-2004. In accordance with previous research we have found that mergers and acquisitions tend to be pro-cyclical in the sense that they occur more often when industry market valuations (q values) are high. We have also shown that this is not the case for going private transactions. For example M&A is more likely to take place in bull years, when market values peak, while going private transactions are relatively more likely in bear years (when valuations are at the bottom). This indicates that private non-corporate buyers such as buyouts funds or incumbent managers enter the takeover market when valuations are low. The main finding is thus that going private transactions and M&A are apparently driven by different causal mechanisms.

There are several possible explanations for these differences. One is that acquiring listed companies find it easier to finance acquisitions when market values are high while private buyers are less sensitive to fluctuations in market valuations because they are not listed, i.e. they cannot use own shares as payment. Alternatively, waves of mergers and acquisitions may reflect agency costs of free cash flow which are more serious in listed companies where ownership and control is separated to a greater degree. Finally, high stock prices may make both investors and acquiring companies more optimistic concerning the future business outlook which could make it more

attractive to invest. Or maybe going private investors (e.g. incumbent management or buyout funds) have a better understanding of what the specific firm value is (Jensen, 2007).

However, although M&A is more likely than going private transactions in industries with high average q-values, we cannot be sure that these industries are overvalued. As expected, we found no significant industry q effect in the relatively transparent financial industries and or in large firms, but the industry q effect was only significant in the more transparent industries with low R&D intensities. Although they do not invest much in the highly regulated financial industries, buyout funds are believed to prefer investing in relatively transparent and mature industries with high stable cash flows and to avoid more opaque and risky industries like pharmaceuticals. Remember that private equity buyout funds only accounts for a part of the going private transactions.

Furthermore, it is not self evident that buying cheap is equivalent to investing smart. Using basic neoclassical arguments it will not always be more profitable to buy in industries where industry q is low. There may be momentum effects as well as mean reversion in q values. To test this idea we tracked the subsequent evolution of industry q and industry stock returns following M&A and going private transactions. We found no significant difference between M&A or going private transactions in industry q evolution or stock returns in the first year after the transaction. For example there were relatively many mergers and acquisitions in 1997 and 1998 when q values were high, but they continued to increase in the period after. Likewise the relatively many going private transactions during the bear market in 2001 were followed by a further decline in q-values in 2002. It may be argued that a substantial part of the value of the 1998-2000 acquisition boom was written off in 2001-2003, while all the private equity investment in the bear years 2001-2002 benefited from value increases in 2003-2004, but there are also many uncertainties in a complex argument like this.

Even if private buyers were smarter investors than companies during the boom and bust years around the millennium, some of this may be attributable to luck since private

equity funds "happened" to emerge in time to profit from the bear market in 2001-2003.[70] Alternatively, private buyers may be more focused on value creation since they represent concentrated ownership and other governance characteristics. Moreover, private buyers may be less concerned about pre-empting competitors in bidding for acquisition targets. They can afford to participate only if they believe that the individual transaction will create value without taking into consideration repercussions on incumbent businesses.

It is not clear, however, that private buyers will be able to sustain this performance in the future. There has been a massive build up of capital in private equity funds which appears to have led to increased competition, higher stock prices and lower returns among funds (Kaplan and Schoar, 2005). Incentive structures which reward fund managers (general partners) in proportion to the value of assets under management may further exacerbate these problems. At the same time listed companies have probably become more focused on the efficient utilization of capital, and many have decided to buy back shares or raise dividends rather than use excess funds for possibly value destroying acquisitions.

As for future research, it seems desirable to get more information on buyers, particularly to be able to distinguish between buyout funds and other acquirers in the case of going private transactions. There may also be interesting differences between domestic and cross border M&A between listed companies and between listed and unlisted companies. Intuitively, foreign buyers and unlisted companies should be less influenced by stock market trends. On the same argument acquirers in other industries would presumably be less affected by value trends in the industry of the acquired company.

[70] Our results are robust if we control for trend effects on M&A and going private frequency by including past going private frequency by country and year.

References

1) Alti, A., 2006. How Persistent Is the Impact of Market Timing on Capital Structure? *Journal of Finance* 61(4), 1681-1710.
2) Andrade, G., Mitchell, M., Stafford, E., 2001. New Evidence and Perspectives on Mergers. *Journal of Economic Perspectives* 15(2), 103-120.
3) Ang, J., Cheng, Y., 2007. Direct Evidence of the Market-Driven Acquisitions Theory. *Journal of Financial Research*, forthcoming.
4) Baker, M., Wurgler, J., 2002. Market Timing and Capital Structure. *Journal of Finance* 57(1), 1-32.
5) Baker, M., Stein, J., Wurgler, J., 2003. When does the market matter? Stock prices and the investment of equity-dependent firms. *Quarterly Journal of Economics* 118, 969–1005.
6) Bargeron, L., Schlingemann, F., Stulz, R., and C. Zutter, 2007. Why Do Private Acquirers Pay So Little Compared to Public Acquirers? NBER Working paper no. 13061.
7) Barnes, P., 2000. The identification of UK takeover targets using published historical cost accounting data. Some empirical evidence comparing logit with linear discriminant analysis and raw financial ratios with industry-relative ratios. *International Review of Financial Analysis* 9(2), 147-162.
8) Barro, R.J., 1990. The stock market and investment. *Review of Financial Studies* 3(1), 115–131.
9) Benninga, S., Helmantel, M., Sarig, O., 2005. The timing of initial public offerings. *Journal of Financial Economics* 75, 115-132.
10) Bharath, S.T., Dittmar, A.K., 2006. To Be or Not to Be (Public). Using going private transactions to examine why firms go public. University of Michigan Ross School of Business Research Paper.
11) Comment, R., Jarrell, G., 1995. Corporate focus and stock returns. *Journal of Financial Economics* 37, 67–87.
12) Cressy, R., Munari, F., Malipiero, A., 2007. Playing to their strengths? Evidence that specialization in the private equity industry confers competitive advantage. *Journal of Corporate Finance*, forthcoming.

13) Cudd, M., Duggal, R., 2000. Industry Distributional Characteristics of Financial Ratios: An Acquisition Theory Application. *Financial Review* 35(1), 105-120.

14) Deloitte, 2005. News Release: European Buy-out market continues to break records.

15) Desbrières, P., Schatt, A., 2002. The Impacts of LBOs on the Performance of Acquired Firms: the French Case. *Journal of Business Finance and Accounting* 29, 695-729.

16) Dewey, D., 1961. Mergers and Cartels: Some Restrictions about Policy. *American Economic Review. Papers and Proceedings of the Seventy-Third Annual Meeting of the American Economic Association* 51(2), 255-262.

17) Dietrich, J.K., Sorensen, D.E., 1984. An Application of Logit Analysis to Prediction of Merger Targets. *Journal of Business Research* 12, 393-402.

18) Dimson, E., Mussavian, M., 2000. Market Efficiency, chapter in Dahiya, S., ed., The Current State of Business Disciplines: Spellbound Publications.

19) Dong, M., Hirshleifer, D., Richardson, S., Teoh, S.H., 2006. Does Investor Misvaluation Drive the Takeover Market? *Journal of Finance* 61(2), 725-762.

20) Gort, M., 1969. An Economic Disturbance Theory of Mergers. *The Quarterly Journal of Economics* 83(4), 624-642.

21) Gottschalg, O., Phalippou, L., Zollo, M., 2004. Performance of Private Equity Funds: Another Puzzle? Working paper, INSEAD and Wharton.

22) Guo, S., Hotchkiss, E., Song, W., 2007. Do Buyouts (Still) Create Value? Working paper.

23) Harford, J., 2005. What drives merger waves? *Journal of Financial Economics* 77, 529-560.

24) Harlow, W.V., Howe, J.S., 1993. Leveraged buyouts and insider non trading. *Financial Management* 22(1), 109-118.

25) Jensen, M.C., 1986. Agency costs of free cash flow, corporate finance and takeovers. *American Economic Review* 76(2), 323-329.

26) Jensen. M., 1989. Active Investors, LBOs and the Privatization of Bankruptcy. *Journal of Applied Corporate Finance* 2, 35-44.

27) Jensen, M., 2007. The Economic Case for Private Equity. Harvard NOM Research Paper No. 07-02.

28) Jensen, M., Kaplan, S., Ferenbach, C., Feldberg, M., Moon, J., Hoesterey, B., Davis, C., Jones, A., 2006. Morgan Stanley Roundtable on Private Equity and its Import for Public Companies. *Journal of Applied Corporate Finance* 18(3), 8-37.

29) Jovanovic, B., Rousseau, P.L., 2002a. The Q-Theory of Mergers. *American Economic Review* 92(2), 198-204.

30) Jovanovic, B., Rousseau, P.L., 2002b. Mergers as Reallocation. NBER Working paper no. 9279.

31) Kaplan, S., 1989a. The Effects from Management Buyouts on Operations and Value. *Journal of Financial Economics* 24, 217-254.

32) Kaplan, S., 1989b. Management Buyouts: Evidence on taxes as a source of value. *Journal of Finance* 44, 611-632.

33) Kaplan, S., Schoar, A., 2005. Private Equity Performance: Returns Persistence and Capital. *Journal of Finance* 60(4), 1791-1823.

34) Levine, R., 1997. Financial Development and Economic Growth: Views and Agenda. *Journal of Economic Literature* 35, 688–726.

35) Lowenstein, L., 1985. Management buyouts. *Columbia Law Review* 85(4), 730-784.

36) Lowry, M., Schwert, G., 2002. IPO market cycles: Bubbles or Sequential Learning? *Journal of Finance* 57, 1171-1200.

37) Maksimovic, V., Phillips, G., 2001. The market for corporate assets: Who engages in mergers and asset sales and are there efficiency gains? *Journal of Finance* 56, 2019-2065.

38) Marais, L., Schipper, K., Smith, A., 1989. Wealth effects of going private for senior securities. *Journal of Financial Economics* 23(1), 155-191.

39) Mitchell, M.L., Mulherin, J.H., 1996. The Impact of Industry Shocks on Takeover and Restructuring Activity. *Journal of Financial Economics* 41, 193-229.

40) Morck, R., Shleifer, A., Vishny, R.W., 1990. The stock market and investment: Is the market a sideshow? *Brookings Papers on Economic Activity* 1990(2), 157–202.

41) Myers, S., Majluf, N., 1984. Corporate Financing and Investment Decisions when Firms have Information that Investors do not have. *Journal of Financial Economics* 13, 187-221.

42) Nelson, R., 1959. Merger Movements in the American Industry. NBER, New York.

43) Nuttal, R., 1999. An Empirical Analysis of the Effects of the Threat of Takeover on UK Company Performance. Economics Papers 1999-w5, Economics Group, Nuffield College, University of Oxford.

44) Palepu, K.G., 1986. Predicting Takeover Targets. *Journal of Accounting and Economics* 8(1), 3-35.

45) Perfect, S., Wiles, K., 1994. Alternative Constructions of Tobin's q: An Empirical Comparison. *Journal of Empirical Finance* 1, 313-341.

46) Rhodes-Kropf, M., Viswanathan, S., 2004. Market Valuation and Merger Waves. *Journal of Finance* 59(6), 2685-2718.

47) Rhodes-Kropf, M., Robinson, D.T., Viswanathan, S., 2005. Valuation Waves and Merger Activity: The Empirical Evidence. *Journal of Financial Economics* 77, 561-603.

48) Schmidt, D., Nowak, E., Knigge, A., 2004. On the Performance of Private Equity Investments: Does Market Timing matter? Working paper.

49) Shleifer, A., Summers, C.H., 1988. Breach of trust in hostile takeovers, chapter 2 in Auerbach, A.J., ed., Corporate takeovers: causes and consequences. University of Chicago Press, Chicago.

50) Shleifer, A., Vishny R.W., 2003. Stock Market Driven Acquisitions. *Journal of Financial Economics* 70, 295-311.

51) Smith, A., 1990. Corporate Ownership Structure and Performance. *Journal of Financial Economics* 27, 143-164.

52) Vinten, F., 2007. The Performance of Private Equity Fund Owned Firms. Working paper, Copenhagen Business School.

53) Zeckhouser, R.J., Pound, J., 1990. Are Large Shareholders Effective Monitors? An Investigation of Share Ownership and Corporate Performance, in Hubbard, G.R., ed., Asymmetric Information, Corporate Finance and Investment. University of Chicago Press, Chicago.

TITLER I PH.D.SERIEN:

2004

1. Martin Grieger
Internet-based Electronic Marketplaces and Supply Chain Management

2. Thomas Basbøll
LIKENESS
A Philosophical Investigation

3. Morten Knudsen
Beslutningens vaklen
En systemteoretisk analyse of moderniseringen af et amtskommunalt sundhedsvæsen 1980-2000

4. Lars Bo Jeppesen
Organizing Consumer Innovation
A product development strategy that is based on online communities and allows some firms to benefit from a distributed process of innovation by consumers

5. Barbara Dragsted
SEGMENTATION IN TRANSLATION AND TRANSLATION MEMORY SYSTEMS
An empirical investigation of cognitive segmentation and effects of integrating a TM system into the translation process

6. Jeanet Hardis
Sociale partnerskaber
Et socialkonstruktivistisk casestudie af partnerskabsaktørers virkelighedsopfattelse mellem identitet og legitimitet

7. Henriette Hallberg Thygesen
System Dynamics in Action

8. Carsten Mejer Plath
Strategisk Økonomistyring

9. Annemette Kjærgaard
Knowledge Management as Internal Corporate Venturing
– a Field Study of the Rise and Fall of a Bottom-Up Process

10. Knut Arne Hovdal
De profesjonelle i endring
Norsk ph.d., ej til salg gennem Samfundslitteratur

11. Søren Jeppesen
Environmental Practices and Greening Strategies in Small Manufacturing Enterprises in South Africa
– A Critical Realist Approach

12. Lars Frode Frederiksen
Industriel forskningsledelse
– på sporet af mønstre og samarbejde i danske forskningsintensive virksomheder

13. Martin Jes Iversen
The Governance of GN Great Nordic
– in an age of strategic and structural transitions 1939-1988

14. Lars Pynt Andersen
The Rhetorical Strategies of Danish TV Advertising
A study of the first fifteen years with special emphasis on genre and irony

15. Jakob Rasmussen
Business Perspectives on E-learning

16. Sof Thrane
The Social and Economic Dynamics of Networks
– a Weberian Analysis of Three Formalised Horizontal Networks

17. Lene Nielsen
Engaging Personas and Narrative Scenarios – a study on how a user-centered approach influenced the perception of the design process in the e-business group at AstraZeneca

18. S.J Valstad
Organisationsidentitet
Norsk ph.d., ej til salg gennem Samfundslitteratur

19. Thomas Lyse Hansen
Six Essays on Pricing and Weather risk in Energy Markets

20. Sabine Madsen
Emerging Methods – An Interpretive Study of ISD Methods in Practice

21. Evis Sinani
The Impact of Foreign Direct Investment on Efficiency, Productivity Growth and Trade: An Empirical Investigation

22. Bent Meier Sørensen
Making Events Work
Or, How to Multiply Your Crisis

23. Pernille Schnoor
Brand Ethos
Om troværdige brand- og virksomheds-identiteter i et retorisk og diskursteoretisk perspektiv

24. Sidsel Fabech
Von welchem Österreich ist hier die Rede?
Diskursive forhandlinger og magtkampe mellem rivaliserende nationale identitets- konstruktioner i østrigske pressediskurser

25. Klavs Odgaard Christensen
Sprogpolitik og identitetsdannelse i flersprogede forbundsstater
Et komparativt studie af Schweiz og Canada

26. Dana B. Minbaeva
Human Resource Practices and Knowledge Transfer in Multinational Corporations

27. Holger Højlund
Markedets politiske fornuft
Et studie af velfærdens organisering i perioden 1990-2003

28. Christine Mølgaard Frandsen
A.s erfaring
Om mellemværendets praktik i en trans-formation af mennesket og subjektiviteten

29. Sine Nørholm Just
The Constitution of Meaning
– A Meaningful Constitution? Legitimacy, identity, and public opinion in the debate on the future of Europe

2005

1. Claus J. Varnes
Managing product innovation through rules – The role of formal and structured methods in product development

2. Helle Hedegaard Hein
Mellem konflikt og konsensus
– Dialogudvikling på hospitalsklinikker

3. Axel Rosenø
Customer Value Driven Product Innova-tion – A Study of Market Learning in New Product Development

4. Søren Buhl Pedersen
Making space
An outline of place branding

5. Camilla Funck Ellehave
Differences that Matter
An analysis of practices of gender and organizing in contemporary workplaces

6. Rigmor Madeleine Lond
Styring af kommunale forvaltninger

7. Mette Aagaard Andreassen
Supply Chain versus Supply Chain Benchmarking as a Means to Managing Supply Chains

8. Caroline Aggestam-Pontoppidan
From an idea to a standard
The UN and the global governance of accountants' competence

9. Norsk ph.d.

10. Vivienne Heng Ker-ni
An Experimental Field Study on the Effectiveness of Grocer Media Advertising
Measuring Ad Recall and Recognition, Purchase Intentions and Short-Term Sales

11. Allan Mortensen
Essays on the Pricing of Corporate Bonds and Credit Derivatives

12. Remo Stefano Chiari
Figure che fanno conoscere

Itinerario sull'idea del valore cognitivo e espressivo della metafora e di altri tropi da Aristotele e da Vico fino al cognitivismo contemporaneo

13. Anders McIlquham-Schmidt
Strategic Planning and Corporate Performance
An integrative research review and a meta-analysis of the strategic planning and corporate performance literature from 1956 to 2003

14. Jens Geersbro
The TDF – PMI Case
Making Sense of the Dynamics of Business Relationships and Networks

15 Mette Andersen
Corporate Social Responsibility in Global Supply Chains
Understanding the uniqueness of firm behaviour

16. Eva Boxenbaum
Institutional Genesis: Micro – Dynamic Foundations of Institutional Change

17. Peter Lund-Thomsen
Capacity Development, Environmental Justice NGOs, and Governance: The Case of South Africa

18. Signe Jarlov
Konstruktioner af offentlig ledelse

19. Lars Stæhr Jensen
Vocabulary Knowledge and Listening Comprehension in English as a Foreign Language
An empirical study employing data elicited from Danish EFL learners

20. Christian Nielsen
Essays on Business Reporting
Production and consumption of strategic information in the market for information

21. Marianne Thejls Fischer
Egos and Ethics of Management Consultants

22. Annie Bekke Kjær
Performance management i Proces-innovation
– belyst i et social-konstruktivistisk perspektiv

23. Suzanne Dee Pedersen
GENTAGELSENS METAMORFOSE
Om organisering af den kreative gøren i den kunstneriske arbejdspraksis

24. Benedikte Dorte Rosenbrink
Revenue Management
Økonomiske, konkurrencemæssige & organisatoriske konsekvenser

25. Thomas Riise Johansen
Written Accounts and Verbal Accounts
The Danish Case of Accounting and Accountability to Employees

26. Ann Fogelgren-Pedersen
The Mobile Internet: Pioneering Users' Adoption Decisions

27. Birgitte Rasmussen
Ledelse i fællesskab – de tillidsvalgtes fornyende rolle

28. Gitte Thit Nielsen
Remerger
– skabende ledelseskræfter i fusion og opkøb

29. Carmine Gioia
A MICROECONOMETRIC ANALYSIS OF MERGERS AND ACQUISITIONS

30. Ole Hinz
Den effektive forandringsleder: pilot, pædagog eller politiker?
Et studie i arbejdslederes meningstilskrivninger i forbindelse med vellykket gennemførelse af ledelsesinitierede forandringsprojekter

31. Kjell-Åge Gotvassli
Et praksisbasert perspektiv på dynamiske læringsnettverk i toppidretten
Norsk ph.d., ej til salg gennem Samfundslitteratur

32. Henriette Langstrup Nielsen
Linking Healthcare
An inquiry into the changing performances of web-based technology for asthma monitoring

33. Karin Tweddell Levinsen
Virtuel Uddannelsespraksis
Master i IKT og Læring – et casestudie i hvordan proaktiv proceshåndtering kan forbedre praksis i virtuelle læringsmiljøer

34. Anika Liversage
Finding a Path
Labour Market Life Stories of Immigrant Professionals

35. Kasper Elmquist Jørgensen
Studier i samspillet mellem stat og erhvervsliv i Danmark under 1. verdenskrig

36. Finn Janning
A DIFFERENT STORY
Seduction, Conquest and Discovery

37. Patricia Ann Plackett
Strategic Management of the Radical Innovation Process
Leveraging Social Capital for Market Uncertainty Management

2006

1. Christian Vintergaard
Early Phases of Corporate Venturing

2. Niels Rom-Poulsen
Essays in Computational Finance

3. Tina Brandt Husman
Organisational Capabilities, Competitive Advantage & Project-Based Organisations
The Case of Advertising and Creative Good Production

4. Mette Rosenkrands Johansen
Practice at the top
– how top managers mobilise and use non-financial performance measures

5. Eva Parum
Corporate governance som strategisk kommunikations- og ledelsesværktøj

6. Susan Aagaard Petersen
Culture's Influence on Performance Management: The Case of a Danish Company in China

7. Thomas Nicolai Pedersen
The Discursive Constitution of Organizational Governance – Between unity and differentiation
The Case of the governance of environmental risks by World Bank environmental staff

8. Cynthia Selin
Volatile Visions: Transactons in Anticipatory Knowledge

9. Jesper Banghøj
Financial Accounting Information and Compensation in Danish Companies

10. Mikkel Lucas Overby
Strategic Alliances in Emerging High-Tech Markets: What's the Difference and does it Matter?

11. Tine Aage
External Information Acquisition of Industrial Districts and the Impact of Different Knowledge Creation Dimensions
A case study of the Fashion and Design Branch of the Industrial District of Montebelluna, NE Italy

12. Mikkel Flyverbom
Making the Global Information Society Governable
On the Governmentality of Multi-Stakeholder Networks

13. Anette Grønning
Personen bag
Tilstedeværelse i e-mail som interaktionsform mellem kunde og medarbejder i dansk forsikringskontekst

14. Jørn Helder
One Company – One Language?
The NN-case

15. Lars Bjerregaard Mikkelsen
Differing perceptions of customer value
Development and application of a tool for mapping perceptions of customer value at both ends of customer-supplier dyads in industrial markets

16. Lise Granerud
Exploring Learning
Technological learning within small manufacturers in South Africa

17. Esben Rahbek Pedersen
Between Hopes and Realities: Reflections on the Promises and Practices of Corporate Social Responsibility (CSR)

18. Ramona Samson
The Cultural Integration Model and European Transformation.
The Case of Romania

2007

1. Jakob Vestergaard
Discipline in The Global Economy
Panopticism and the Post-Washington Consensus

2. Heidi Lund Hansen
Spaces for learning and working
A qualitative study of change of work, management, vehicles of power and social practices in open offices

3. Sudhanshu Rai
Exploring the internal dynamics of software development teams during user analysis
A tension enabled Institutionalization Model; "Where process becomes the objective"

4. Norsk ph.d.
Ej til salg gennem Samfundslitteratur

5. Serden Ozcan
EXPLORING HETEROGENEITY IN ORGANIZATIONAL ACTIONS AND OUTCOMES
A Behavioural Perspective

6. Kim Sundtoft Hald
Inter-organizational Performance Measurement and Management in Action – An Ethnography on the Construction of Management, Identity and Relationships

7. Tobias Lindeberg
Evaluative Technologies
Quality and the Multiplicity of Performance

8. Merete Wedell-Wedellsborg
Den globale soldat
Identitetsdannelse og identitetsledelse i multinationale militære organisationer

9. Lars Frederiksen
Open Innovation Business Models
Innovation in firm-hosted online user communities and inter-firm project ventures in the music industry
– A collection of essays

10. Jonas Gabrielsen
Retorisk toposlære – fra statisk 'sted' til persuasiv aktivitet

11. Christian Moldt-Jørgensen
Fra meningsløs til meningsfuld evaluering. Anvendelsen af studentertilfredshedsmålinger på de korte og mellemlange videregående uddannelser set fra et psykodynamisk systemperspektiv

12. Ping Gao
Extending the application of actor-network theory
Cases of innovation in the telecommunications industry

13. Peter Mejlby
Frihed og fængsel, en del af den samme drøm?
Et phronetisk baseret casestudie af frigørelsens og kontrollens sameksistens i værdibaseret ledelse!

14. Kristina Birch
Statistical Modelling in Marketing

15. Signe Poulsen
Sense and sensibility: The language of emotional appeals in insurance marketing

16. Anders Bjerre Trolle
Essays on derivatives pricing and dynamic asset allocation

17. Peter Feldhütter
Empirical Studies of Bond and Credit Markets

18. Jens Henrik Eggert Christensen
Default and Recovery Risk Modeling and Estimation

19. Maria Theresa Larsen
Academic Enterprise: A New Mission for Universities or a Contradiction in Terms? Four papers on the long-term implications of increasing industry involvement and commercialization in academia

20. Morten Wellendorf
Postimplementering af teknologi i den offentlige forvaltning
Analyser af en organisations kontinuerlige arbejde med informationsteknologi

21. Ekaterina Mhaanna
Concept Relations for Terminological Process Analysis

22. Stefan Ring Thorbjørnsen
Forsvaret i forandring
Et studie i officerers kapabiliteter under påvirkning af omverdenens forandringspres mod øget styring og læring

23. Christa Breum Amhøj
Det selvskabte medlemskab om managementstaten, dens styringsteknologier og indbyggere

24. Karoline Bromose
Between Technological Turbulence and Operational Stability
– An empirical case study of corporate venturing in TDC

25. Susanne Justesen
Navigating the Paradoxes of Diversity in Innovation Practice
– A Longitudinal study of six very different innovation processes – in practice

26. Luise Noring Henler
Conceptualising successful supply chain partnerships
– Viewing supply chain partnerships from an organisational culture perspective

27. Mark Mau
Kampen om telefonen
Det danske telefonvæsen under den tyske besættelse 1940-45

28. Jakob Halskov
The semiautomatic expansion of existing terminological ontologies using knowledge patterns discovered on the WWW – an implementation and evaluation

29. Gergana Koleva
European Policy Instruments Beyond Networks and Structure: The Innovative Medicines Initiative

30. Christian Geisler Asmussen
Global Strategy and International Diversity: A Double-Edged Sword?

31. Christina Holm-Petersen
Stolthed og fordom
Kultur- og identitetsarbejde ved skabelsen af en ny sengeafdeling gennem fusion

32. Hans Peter Olsen
Hybrid Governance of Standardized States
Causes and Contours of the Global Regulation of Government Auditing

33. Lars Bøge Sørensen
Risk Management in the Supply Chain

34. Peter Aagaard
Det unikkes dynamikker
De institutionelle mulighedsbetingelser bag den individuelle udforskning i professionelt og frivilligt arbejde

35. Yun Mi Antorini
Brand Community Innovation
An Intrinsic Case Study of the Adult Fans of LEGO Community

36. Joachim Lynggaard Boll
Labor Related Corporate Social Performance in Denmark
Organizational and Institutional Perspectives

2008

1. Frederik Christian Vinten
Essays on Private Equity

TITLER I ATV PH.D.-SERIEN

1992

1. Niels Kornum
Servicesamkørsel – organisation, økonomi og planlægningsmetoder

1995

2. Verner Worm
Nordiske virksomheder i Kina
Kulturspecifikke interaktionsrelationer ved nordiske virksomhedsetableringer i Kina

1999

3. Mogens Bjerre
Key Account Management of Complex Strategic Relationships
An Empirical Study of the Fast Moving Consumer Goods Industry

2000

4. Lotte Darsø
Innovation in the Making
Interaction Research with heterogeneous Groups of Knowledge Workers creating new Knowledge and new Leads

2001

5. Peter Hobolt Jensen
Managing Strategic Design Identities
The case of the Lego Developer Network

2002

6. Peter Lohmann
The Deleuzian Other of Organizational Change – Moving Perspectives of the Human

7. Anne Marie Jess Hansen
To lead from a distance: The dynamic interplay between strategy and strategizing – A case study of the strategic management process

2003

8. Lotte Henriksen
Videndeling
– om organisatoriske og ledelsesmæssige udfordringer ved videndeling i praksis

9. Niels Christian Nickelsen
Arrangements of Knowing: Coordinating Procedures Tools and Bodies in Industrial Production – a case study of the collective making of new products

2005

10. Carsten Ørts Hansen
Konstruktion af ledelsesteknologier og effektivitet

TITLER I DBA PH.D.-SERIEN

2007

1. Peter Kastrup-Misir
Endeavoring to Understand Market Orientation
– and the concomitant co-mutation of the researched, the researcher, the research itself and the truth