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Stock price dynamics around merger and acquisition events

Empirical contributions to the Swiss corporate takeover market

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Abstract

During the last century the number of corporate takeovers has been raising steadily and therefore attracted many scholars to conduct multifaceted research within this field. However, the Swiss M&A market is only covered poorly. Since current insights add considerable value to the existing evidence, the thesis states six hypotheses focused on the Swiss market for the post period of the sixth merger wave (2008 to 2011).

In a first step, the paper uses the event study methodology and the ANOVA approach. By applying these tools, it measures the dynamics of the abnormal returns generated by Swiss bidding and target firms' shares around M&A deal publications. This is done for short-term event windows, up to twenty-one days around the event announcement. In a second step, the abnormal returns are regressed on transaction characteristics to evaluate the sensitivities and drivers by the ordinary least square estimation approach (OLS). The abnormal returns are computed by using the standard market model and the adjusted beta market model. To account for the difference of the capital structure regarding the financial industry, the OLS-analysis is done with and without the data from the banking sector.

While the thesis accepts **hypothesis one**, which states that shareholders of a Swiss target company receive a positive abnormal return around an M&A announcement, it can not accept **hypothesis two** that claims the same behavior for the investors of the bidding firm. Based on these propositions, **hypothesis three** stipulates that the abnormal return is significantly higher for the shares of the target then for the bidding firm. This outcome is reliably accepted over all event windows.

Hypothesis four and five test if cross-border transactions do create the same abnormal return as domestic deals for shareholders of bidding and target firms. The outcomes imply that cross-border deals do generate significantly less abnormal value for the investors compared to domestic deals. Furthermore, the empirical analysis finds a dependence on the different specified industries. Finally, **hypothesis six** argues that a higher stock share within the means of payment increases the abnormal return for the bidding company. The data during the post period of the sixth merger wave does not show significant influences on this issue for the abnormal return generation.

While hypotheses one and three are in line with the existing international empirical literature, the others mainly contradict it for the most recent period on the Swiss corporate takeover market.

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1 Introduction

Corporate takeovers are amongst the biggest investments a company is capable to conduct, as it is a reasonable way to enhance company value (Kenourgios, Samitas and Tsakalos, 2008). However, as many examples show, not every transaction does create merit for the shareholders of the involved enterprises. Nonetheless, almost all economic sectors have seen an increasing number of mergers and acquisitions (M&A) during the last two decades. The drivers behind such deals are not always economically sound. These different facts are some reasons why scientific studies within this field are numerous and cover different aspects, reaching from behavioral to strategical issues (Betton, Espen Eckbo and Thorbun, 2008: 294). However, the coverage of empirical research for the Swiss market is fairly moderate. Contemporary insights may help to understand the recent situation and contribute to existing global literature. The investigations of the thesis focus solely on short term dynamics of abnormal returns (AR) around an announcement of a corporate takeover. The motivation of this work is not to develop investment strategies for possible future investors, but to present empirical evidence on the actual situation within the Swiss market and comparing these to the existing literature. Additionally, the recent turmoil on the financial markets might have influenced certain dynamics and therefore it provides new evidence on shareholder wealth creation through mergers and acquisitions during economically unstable periods.

The following chapter starts with posing an overview of the paper by presenting the structure. Additionally, it offers a basic insight into common M&A motives as well as definitions and concludes with a brief summary of the Swiss M&A environment.

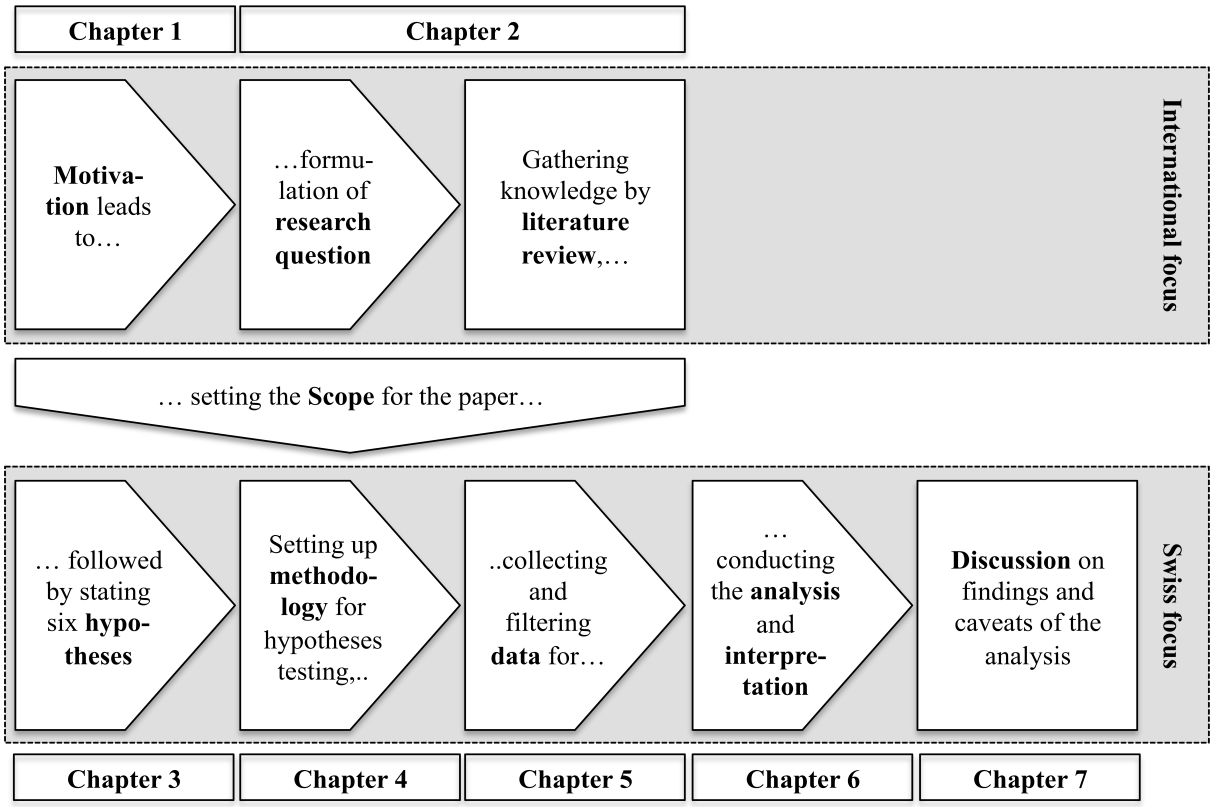
1.1 Structure

This section presents an overview of how the thesis has been developed and supplies a guideline for the reader. Figure 1 depicts the different chapters that are contained. The main principle is that the paper offers a global overview in the beginning and then iteratively delineates the scope by the different hypotheses and finally focuses merely on the Swiss market (cf. figure 1).

Chapter one provides some basic information on the corporate takeover market (cf. figure 1). Derived from the information within chapter one, chapter two states a general research question that sets the frame for the literature review. The literature review offers a summary over internationally conducted empirical studies on stock price reactions around corporate takeover announcements. Hence, it builds the groundwork for the hypotheses developed in chapter three. This is due to the fact that it records the different findings for international markets and therefore, sets some guidelines about the expected reaction within the Swiss market.

The hypotheses chapter (cf. chapter three) builds the heart of the paper, as the aim of the work is to accept or decline these statements (cf. figure 1).

Figure 1: Structure of thesis



Source: own creation

For conducting a proper event study, chapter four provides knowledge on the methodology used within the analysis part. It offers a discussion on several models and explains the most appropriate for the purpose of measuring abnormal returns. The collected data sample is described in chapter five. This part offers an insight how the final data set has been selected.

The analysis chapter (cf. chapter six) applies the methodology and consequently uses the assembled data sample. The output of the analysis is interpreted subsequently for each hypothesis. Finally, chapter seven concludes the overall findings and implications uncoupled from the hypotheses. This allows the reader to gain a sound understanding on the dynamics within the Swiss corporate takeover market. Furthermore, it discusses several implications and caveats of the paper. This includes specific econometric issues that influence the outcome of the different analyses conducted, the lessons learned during the iterative process of this paper as well as ideas for further research.

1.2 An introduction into M&A

The goal of section 1.2 is to provide the reader with a general understanding of merger and acquisition events. This will support the reading through later chapters. While sections 1.2.1 to 1.2.3 exhibit general M&A topics, section 1.2.4 aims to present a short overview on the Swiss M&A environment. Knowing the different definitions and types of mergers and acquisitions as well as the motivation behind it, helps to interpret the empirical findings in chapter six. Additionally, the retrospection on previous merger waves in combination with the Swiss M&A characteristics provide some intertemporal insights.

1.2.1 Definitions and types of M&A

The literature about corporate takeovers contains different definitions of forms for mergers and acquisitions and is not always consistent with its application. On a general level, Clayman, Fridson and Troughton (2008: 370) paraphrase **an acquisition** as an event when the bidder purchases only a part of another company. This might refer to a definable segment of a firm or to a part of its stocks (Brealey, Marcus and Myers, 2012: 598). In contrast, Gaughan (1999: 7) describes **a merger** as a transaction where the bidding company purchases the total assets and liabilities of a target company. Therefore, the target company usually disappears after the transaction as it gets completely integrated into the bidding company. Beck, Scharf and Shea (1991: 37) name this specific type of transaction statutory merger. Furthermore, if the bidding company wants to take advantages from a well-positioned company or brand, they initiate a subsidiary merger, which converts the target company to a subsidiary of the bidding company (Clayman et al., 2008: 370). Within this paper all previously described transactions qualify as M&A events. Thus, the paper does not distinguish between the different forms of acquisition.

There are three different types of M&A alignments described by Berk, DeMarzo and Harford (2012: 652). A transaction that involves two companies doing business in the same industry is called a horizontal merger. When a buyer purchases a firm that acts as a supplier or client of the purchaser, the deal type is known as vertical merger. Finally, a transaction between two companies that operate in different industries is defined as a conglomerate merger.

1.2.2 Motives for M&A transactions

For most private investors is investing in the stock market a zero-NPV deal. Corporate investors are able to improve this situation. They add economic value by creating different forms of synergies and conducting wealth transfers (Berk et al., 2012: 653 and Trautwein, 1990: 284). The literature discusses several premises that drive the motivation for a corporate takeover. Trautwein (1990) concludes seven

well-known theories, which are frequently used in empirical research. Figure 2 categorizes these seven theories into different groups to provide an overview. Within the current section the specific theories are briefly introduced.

The **efficiency theory** contains different forms of synergy creating. While financial synergies lead to lower costs of capital, operational synergies try to lower the expenses of the involved business units. Moreover, managerial synergy is knowledge within the incumbent firm that helps the opposite party for a superior planning and monitoring (Trautwein, 1990: 284).

Figure 2: Motives for M&A transactions

<table>
<tr><td colspan="5">Merger as rational choice</td><td rowspan="2">Merger as process outcome</td><td rowspan="2">Merger as macroeconomic phenomenon</td></tr>
<tr><td colspan="4">Merger benefits bidder's shareholders</td><td rowspan="2">Mergers benefit managers</td></tr>
<tr><td>Net gains through synergies</td><td>Wealth transfers from customers</td><td>Wealth transfers from target's shareholders</td><td>Net gains through private information</td><td></td><td></td></tr>
<tr><td>Efficiency theory</td><td>Monopoly theory</td><td>Raider theory</td><td>Valuation theory</td><td>Empire-building theory</td><td>Process theory</td><td>Disturbance theory</td></tr>
</table>

Source: based on Trautwein (1990)

Gaughan (1999: 149) implies that the idea of the **monopoly theory** is to achieve a unique powerful position in a market. However, he adds, in practice is little evidence about the significance of this hypothesis. The **raider theory** refers to minority shareholder who tries to achieve a change in corporate policies. In addition, he closely monitors the incumbent management to improve the performance of the firm (Croci, 2007). Nevertheless, Croci (2007) mentions that the financial press has mixed feelings about such investors. In a setting where the potential bidding company is able to predict the future income streams more accurately and hence is able to calculate a higher company valuation, the scientific literature refers to the **valuation theory** (Trautwein, 1990 and Ravenscraft and Scherer, 1987: 211).

The **empire-building theory** says, that corporate transactions often destroy shareholders' wealth. The purpose of such a deal is to construct a prestigious and large corporation that allows the manager to improve his personal utility (Ravenscraft and Scherer, 1987: 211). Gaughan (1999: 158) names this phenomenon the hubris hypothesis that is often mentioned within the scientific literature. Ravenscraft

and Scherer (1987: 288) describe the **process theory** as an outcome of procedures governed by various influences such as political power and organizational routines. Finally, the **disturbance theory** says that differing individual expectations might under certain assumptions cause a merger wave[1] that is correlated with higher valuations of firms (cf. Gort (1969) and Rhodes and Viswanathan (2004)). However, Ravenscraft and Scherer (1987) underline that this theory is not throughout consistent with the empirical evidence.

Berk et al. (2012) add that corporate transactions improving shareholder value are economical sound drivers (cf. figure 2). In contrast, the further motives listed in figure 2 are regularly dubious and do not aim to create real shareholder value.

1.2.3 M&A waves and their roots

A vast number of scientific papers conclude that M&A activities historically occurred in waves (cf. Clayman et al. (2008: 371) and Rhodes and Viswanathan (2004: 2685) and Brealey, Myers and Allen (2008: 907)). Berk et al. (2012: 650) characterize such waves as peaks of heavy occurring M&A events followed by a quiet period of a sharply decreasing number of transactions.

In the scientific literature one finds two explanations about the occurrence of merger waves, namely the neoclassical and the behavioral theory (Harford, 2005: 532). Harford (2005: 533) explains that under the neoclassical hypothesis corporate activity occurs as a reaction of the firms to a technological, regulatory or economic shock. Chang and Moore (2012: 243) add that increased activity is therefore often concentrated within a small number of industries. Contrary, the behavioral hypothesis[2] states that waves are a function of incorrect valuation between bidding and target firms (Soegiharto, 2008: 1).

Following section provides a brief overview on historical swings in the global corporate takeover market.

The first merger wave is dated back in the end of 1800s. During the period from 1893 to 1904 many horizontal mergers within the US manufacturing and transportation industries arose (KPMG: 2011b). The first wave has been stopped by an antitrust law regarding horizontal mergers but also by the rising of the First World War (Lipton, 2006: 4).

[1] Merger waves are discussed in chapter 1.2.3.
[2] For a more elaborate discussion on this topic consult Shleifer and Vishny (2003).

The second wave occurred during the time of 1916 to 1929. Mainly vertical mergers within the motor vehicle industry impressed it. Since the market was already concentrated and controlled among few firms, companies sought to integrate backward into supply and forward into distribution channels (Chang and Moore, 2012: 243). This trend concluded by the stock market crash in 1929 and the successive great depression (Lipton, 2006: 4).

A strict regulatory environment regarding vertical and horizontal mergers has branded the third wave (1965 – 1969), while the fourth wave (1981 – 1989) experienced quiet lax surroundings regarding this matter (Chang and Moore, 2012: 243). Therefore, the former wave involved mainly conglomerate mergers for market expansion, while the latter was a result from highly leveraged transactions supported by investment banks and hostile takeovers that produced a collapse of banks' capital structures (KPMG, 2011b).

KPMG (2011b) notes that "mega deals" marked the fifth merger wave during 1993 to 2000. These were mainly motivated by larger economies of scale and the assumption that competitive advantages are realized through size (KPMG, 2011b). The burst of the millennium stock price bubble and certain corporate scandals finished this surge.

The most recent wave (sixth) lasted from 2003 until the beginning of 2008. It has been carried by a private equity boom (KPMG, 2011b) and found an end due to the economic downturn. Subsequent, corporate takeover activity decreased to its lowest levels since 2004 (KPMG, 2011b). McKinsey (2011) conducted a study about future M&A transactions and found that one may expect a rising number of deals for the years from 2012. Therein, the main motivation behind the increasing activity is to explore new geographies, products, or intellectual property (McKinsey, 2011).

1.2.4 M&A environment in Switzerland

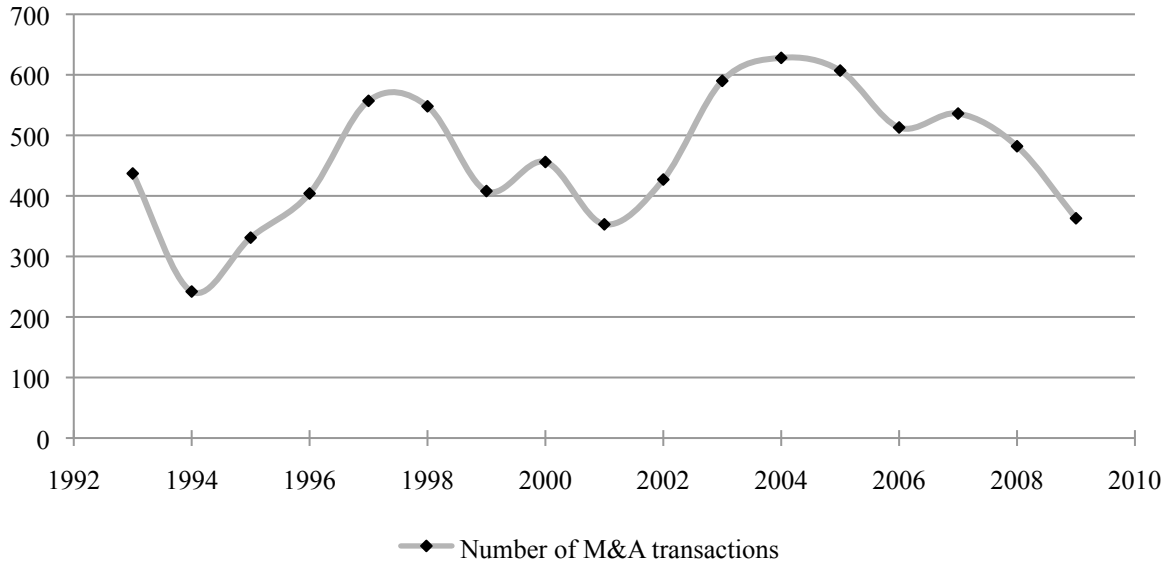
Switzerland is fairly limited in size regarding a geographic and demographic context, however, when it comes to financial services it is a heavyweight with around twenty-seven percent (based on data for 2010) of worldwide assets under management within the private banking sector (FDFA, 2012). Furthermore, the Swiss market shows an above average GDP-weighted M&A transaction volume compared to the other DACH countries[3] during the last decade. This is probably due to the outstanding financing environment and the diversity of excellent enterprises (TCFG, 2010: 5).

[3] The DACH countries are represented by Germany (D), Austria (A), Switzerland (CH).

TCFG (2010: 11) underlines that the Swiss market has become fairly dynamic due to its increased visibility. Therefore, a strong awareness for corporate governance has risen up. Normally, around twenty-five percent of all transactions involve family businesses. However, during 2009 and 2010 this share fell to approximately eight percent of the total transaction number (TCFG, 2010: 11).

Figure 3 depicts the evolution of the numbers of corporate takeovers during the last two decades within the Swiss market. Even though the market suffered remarkably by a reduced transaction amount during the most recent years, it is still more robust than the global M&A environment (TCGF, 2010: 4). As assessed for the international markets in section 1.2.3, also the Swiss market was driven by a high number of private equity transactions during the recent period (TCGF, 2010: 4).

Figure 3: Number of M&A transactions involving a Swiss company over the last two decades



x-axis: represents the specific year
y-axis: represents the number of corporate takeovers within the Swiss market

Source: based on data of TCFG (2010)

TCFG (2010: 25) expects that there is an aim for especially smaller deals with less risk in the close future. Furthermore, mainly companies from sectors that suffered less during the recent financial crisis (health care, energy, telecom and consumer goods) will conduct deals. In conclusion, one has to be aware of the strong positive correlation between the future economic development and the executed deals.

2 Research question and literature review

The aim of chapter two is to provide the reader with the research idea of the thesis (cf. section 2.1). Supplementary, scientific literature as well as empirical research on the topic is discussed in section 2.2. Both parts are crucial inputs for developing the hypotheses stated in chapter three. To gain knowledge from existing literature, a broad focus is applied during this chapter by considering international studies. Therefore, the following research questions set the framework regarding the empirical material taken into account. However, the reader should be aware of the fact that these research questions are not the claimed hypotheses for testing purposes but merely thought as guidance for literature research. Hence, the research question is not yet narrowed for the Swiss market.

2.1 Research question

The goal is to analyze and interpret stock market reactions on corporate merger and acquisition news. Therefore, the research question regarding the main purpose of this thesis is formulated as follows:

> *Do stock price returns of companies, involved in a merger or acquisition transaction, show an abnormal reaction compared to an appropriate benchmark?*

The above mentioned research question is further examined by looking at characteristics of transactions that influence the dynamics of the stock price.

> *Are there characteristics of merger and acquisition transactions that enhance or constrain stock price dynamics of involved parties?*

Section 2.2 offers the reader insight into international scientific research and empirical analyses on the research questions stated above.

2.2 International empiricism on stock price dynamics

This section offers an overview on existing literature regarding the behavior of the abnormal return of target and bidding companies around an announcement date of a corporate takeover. The lion's share of research within this field is conducted for the North American market, while the European market is covered much less dense (Lowinski, Schiereck and Thomas, 2003: 1). Lowinski et al. (2003: 13ff) present empirical evidence on the gains and losses that occur to shareholders of the bidder firm. They use data from 1990 to 2001 for the **Swiss market** and find a significant positive cumulative abnormal

return (CAR) for small event windows of two to five days. However, by expanding the event window, the abnormal return becomes insignificant.

Goergen and Renneboog (2002: 8) researched the effects on shareholders' wealth of the fifth M&A wave during the 1990s. They include transactions from **Continental Europe and the UK**. For the target firm, Georgen and Renneboog (2002: 20) find highly significant abnormal returns for different event windows. The effects on the bidding firms' shares are less strong. On very short-term windows a small significant positive return is present. However, by enlarging the time frame, the abnormal return gets insignificant. Focusing on the DACH region, the effects on bidders and targets shares are similar to the previous ones, but significant results are only found for even shorter event windows (Georgen and Renneboog, 2002: 25). Due to the small sample size of only 7 observations, which were used for the DACH region, the results are not highly reliable.

Croci (2007: 950f) rejects the raider hypothesis for the **European market**, which states that the target stock price reacts negatively to the public announcement of the first share purchases of a raider. A raider is defined as a minority shareholder who wants to change corporate policies within the target company (cf. section 1.2.2). Therefore, the target shareholders anticipate that the raider will extract corporate resources to his advantage, which causes a decline in the firms share price. Furthermore, Croci (2007: 958ff) finds the same evidence as Georgen and Renneboog (2002) on the target firms' reaction with regard to the overall European market and for Switzerland specifically.

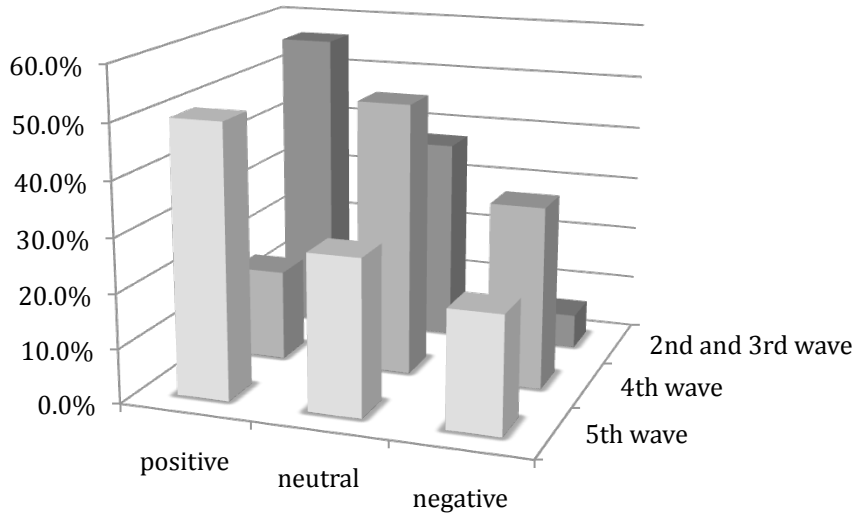
By opening the focus to a global scale, there is extensive work for the **US and UK market** on this issue. Eckbo and Thorburn (2000: 1) mention, there is substantial evidence that shareholders of the target firms realize on average large capital gains from merger and acquisition transactions. However, the evidence on reaction of the bidder firms share price is ambiguous and depending on the specific point in time and associated merger wave.

Martynova and Renneboog (2008: 2154) collected some part of the widespread empirical evidence on the profitability of corporate takeovers and compared it across decades (cf. figure 4 and figure 5). The findings refer to successful domestic M&A transactions between non-financial corporations (Martynova and Renneboog, 2008: 2153). Thus, the following section offers an aggregate of the findings from a broad variety of conducted studies for different markets and merger waves.

While during the second, third and fifth merger wave 50 percent or more of the **bidding firms** experienced positive returns in the short run, just 17 percent of the bidders faced the same effect

during the fourth wave (cf. figure 4). Summing up the isolated waves leads to a smoother picture, which is dominated by the evidence that 43 percent of the studies conclude a positive effect on the bidders share price, while 38 percent found a non-significant effect. Negative cumulative abnormal returns were just found by a minority of the studies (cf. figure 5). Martynova and Renneboog (2008: 2159) suggest distinguishing the findings on the bidder firms between event windows shorter than one month and from windows of one month up to two month. For the longer time frames, Martynova and Renneboog (2008: 2159) conclude that CAR are significantly positive between three to five percent during the third takeover wave, significantly negative for the fourth takeover wave and not different from zero for the fifth wave.

Figure 4: Distribution of empirical findings on bidders abnormal return around M&A events



x-axis: indicates the general outcome within the various studies
y-axis: indicates the different merger waves
z-axis: represents the share of outcome in percentage

Source: own creation based on Martynova and Renneboog (2008)

Andrade, Michell and Stafford (2001) contribute to the short-term research and confirm that across all M&A waves during 1973 to 1998 abnormal gains and losses on stock prices regarding the bidding company are statistically insignificant. These findings, which stem mainly from the Anglo American markets, contradict previous discussed ones from Georgen and Renneboog (2002) and Lowinski et al. (2003) for the European markets. This underlines the ambiguousness of the different outcomes regarding the dynamics of the abnormal returns and shows that these are dependent on time (cf. figure 4) and region.

Examining the **target firm** leads to a fairly different picture. As discussed previously, the evidence during all waves shows merely positive effects on the share price (cf. figure 5). However, the magnitude of the positive CARs differs from study to study. While Lang, Stulz and Walkling (1989) discover a positive cumulative abnormal return of 40.3 percent in the US-market for an eleven-day event window during the third takeover wave, Dennis and McConnell (1986) came up with a CAR of 13.74 percent within the US-market for a similar time period and event window.

Eckbo and Langohr (1989) find a significant CAR of 16.48 percent for an event window of five days from the announcement for French companies during the third wave. This finding might be used as a proxy for the European market for the specific time period.

Figure 5: Summary on empirical findings of stock price reactions around M&A events

Wave 2&3 Relative Values

CAR	Positive CAR	Neutral CAR	Negative CAR	Total
Target	100.0%	0.0%	0.0%	100.0%
Bidder	56.3%	37.5%	6.3%	100.0%

Wave 4 Relative Values

CAR	Positive CAR	Neutral CAR	Negative CAR	Total
Target	100.0%	0.0%	0.0%	100.0%
Bidder	16.7%	50.0%	33.3%	100.0%

Wave 5 Relative Values

CAR	Positive CAR	Neutral CAR	Negative CAR	Total
Target	100.0%	0.0%	0.0%	100.0%
Bidder	50.0%	28.6%	21.4%	100.0%

Total Relative Values

CAR	Positive CAR	Neutral CAR	Negative CAR	Total
Target	100.0%	0.0%	0.0%	100.0%
Bidder	42.9%	38.1%	19.0%	100.0%

Source: based on Martynova and Renneboog (2008: 2154)

Regarding the fourth takeover wave during the eighties, Graham, Lemmon and Wolf (2002) uncovered a significant positive CAR of 22.51 percent on the US-market for a three day event window starting one day before the M&A announcement. Mulherin and Boone (2000) find similar results, which report a 21.2 percent cumulative abnormal return for the same market and event window during the fifth wave in the nineties.

In conclusion, it is obvious that the evidence on target firms is consistent. All articles find a significant positive cumulative return over the defined event window. The results are independent of time and place. This means that the US market is identical to the European market and there is no difference

between the various merger waves. However, looking at the bidders' CAR, the evidence within the literature is fairly ambiguous and shows strong dependence on region and time of the underlying data set.

Previous findings might be further subcategorized in several ways. Many scholars differentiate for cross-border or domestic deals, by the means of payment, by industries, by the nature of the bid either friendly or hostile, for failed or successful bids and for certain time periods, called inter-temporal comparison. Within this paper, further research will be done on the first two categories, namely the differentiation between domestic and cross-border deals and the differentiation regarding the method of payment. Other variables are merely used as control variables (cf. chapter five).

2.2.1 Cross-border transactions

Evenett (2003: 4) mentions that cross-border transactions have increased tremendously since the late eighties. This trend is driven by motives for companies to bolster their market position, enhancing their business or gain synergies by organizing their firm on a global scale (Johansson and Kang, 2000: 30). Additionally, the OECD (2001: 11) highlights that cross-border transactions are mainly motivated by the advantages of economies of scale and scope. The question rises if such cross-border transactions influence the fundamentals of a company, i.e. finance policy, and hence cause a different stock price reaction. Fatemi and Furtado (1988: 364) argue with regard to this point that there are different reasons for dissimilar wealth effect comparing domestic and cross-border transactions:

> "Transnational acquisitions would not be any different from domestic acquisitions, and therefore would not have any differential wealth effects, if
> 1. the market for corporate control were not segmented across national boundaries,
> 2. the capital markets were not internationally segmented, and
> 3. there were no net benefits (disadvantages) associated with international diversification.
>
> However, differential wealth effects may exist if any of these conditions do not hold."

Specifically, the second point raises the question about the definition of an integrated market. Emiris (2002: 218) describes it as a regular situation, where investors face global and country-specific risk factors. However, they price only the global risk, since appropriate diversification within fully integrated markets diminishes country specific risk. In addition, Boyle (2009: 2f) describes four enhancing drivers that are the result of an integrated market; better allocation of capital, more efficient risk sharing, enhanced portfolio diversification and lower cost of capital.

More intuitively is the point mentioned by Davis, Shore and Thompson (1990: 329). They attribute the difference of cross-border transactions to the fact that the basic motivation differs from domestic deals. While domestic deals' intention is mainly due to financial and economies of scale effects, cross-border deals are often initiated for entering new geographic markets. In addition, they pin out that the costs of integration will differ because of the pattern of ownership and control of companies as well as a more difficult access to information about the possible counterparty. These differences, as stated above by the first and third criteria of Fatemi and Furtado, could finally lead to a different price reaction.

Former research on domestic and cross-border transactions is versatile and exhibits some kind of dependence on certain characteristics. Georgen and Renneboog (2002: 24) find that the announcement effect on abnormal returns for domestic and cross-border targets amounts to 10.2 percent and 11.3 percent respectively for the period from 1993 to 2000. However, the divergence between them is not statistically significant.

While in general **European** bidder shares react insignificantly to domestic deals, they react significantly positive to cross-border transactions. The significance is only justified for short event windows over two to five days (Georgen and Renneboog, 2002: 25).

Lowinski et al. (2003: 15) conclude for the **Swiss market** that there are no significant differences between the cumulative abnormal returns of national and cross-border transactions regarding the bidders' shares for most tested event windows. They summarize that from a capital markets perspective the international orientation does not systematically influence the valuation of a merger and that the Swiss capital market is highly integrated with the worlds' and especially Europes' capital markets. This conclusion is based on data from 1990 to 2001.

Francis, Hasan and Sun (2007: 1528) compared data from domestic **North American** acquirers against cross-border US acquirers from 1990 to 1995 and from 1996 to 2003. Therein, they find only a statistically significant difference in abnormal returns for the former period, which reflects that domestic transactions earn a superior return. This supports their hypothesis, which states that this effect might be anticipated due to the advanced integration of financial markets during the past years, backing up Lowinski et al. (2003) findings for the Swiss market. However, using the total sample from 1990 to 2003, Francis et al. (2003: 1528) find a statistically significant difference between cross-border and domestic transactions, which supports Georgen and Renneboog (2002) findings for the European market.

2.2.2 Means of payment

The means of payment is a crucial factor within a merger and acquisition transaction. It may influence the successful completion of the deal as well as the post performance of the combined companies (Riggs and Slusser, 1994: 209). Basically, there are two extreme forms of payment possible, involving fully cash or stock financing. Also combinations are regularly seen (Beck et al. 1991: 93). As a substitute for stocks, different forms of securities could be offered, which range from preferred shares to debt securities (Chang and Moore, 2012: 253). Martynova and Renneboog (2009: 297f) analyzed 1361 European corporate transactions between 1993 and 2001. Thereof, 62.8 percent are cash transaction, 19 percent mixed and only 18.2 percent are paid using the bidder's stocks.

Martin (1996: 1242) states that there are many different reasons that determine the final choice of the means of payment for a corporate takeover. The final outcome is normally dependent on characteristics of the bidding and target firm as well as on environmental factors. For instance, if the management of a bidding firm is aware of the fact that their company is overvalued, they should offering stocks as payment method. In the case the bidder company is undervalued and management expects an increasing stock price, acquisitions should be done in cash (Travlos, 1987: 944). This approach clearly underlines the problem of asymmetric information between the bidder's management and external shareholders (Georgen and Renneboog, 2002: 26).[4]

Martynova and Renneboog (2009: 303) add that the effect of risk sharing comes into play when a transaction involves a high portion of stock payment. By receiving stocks from the bidding company, the target shareholders participate in future market reactions on the combined conglomerate and therefore also bear investment risk. Intuitively, possible future deficits are divided on a bigger stockholder base and hence, release incumbent stockholders. In contrast, a stock offering could also be received as a negative signaling effect to the existing shareholders of the bidding firm as described above. More specifically, when management prefers share payment they imply the own company to be overvalued and hence causing a negative information effect (Travlos, 1987: 944). As a consequence, if such effects are valuable, the final reaction of the bidding firm's stock price includes the gain from the takeover and the information effect delivered through the means of payment (Travlos, 1987: 944).

Georgen and Renneboog (2002: 27) examine the sensitivity of the target's stock price reactions to the means of payment. For total cash offers they find significant AR ranging from around 10 percent on the announcement day up to roughly 29 percent for a 121 days event window. Furthermore, they find

[4] For a more elaborate discussion on asymmetric information consult Martin (1996).

significantly lower abnormal returns for stock and mixed offerings compared to the total cash offer. Supportive to previous study, Chen, Chou and Lee (2011: 2231) mention that the scientific literature widely states that cash offers achieve significantly higher returns for target stockholders than stock or mixed payment acquisitions.

Looking at the bidder's stock price reaction reveals a completely different picture. Georgen and Renneboog (2002: 27) find reliable positive abnormal returns for cash bids of 0.37 percent and 0.9 percent for the event day and a five days event window respectively. In contrast to the target firms, Georgen and Renneboog (2002: 27) state that bidding companies befall higher abnormal returns using stock than cash offers. They report significant positive AR of around one percent on the event day up to 2.72 percent on a 121 event-days window.

3 Scope and hypotheses

Chapter three first defines the scope of the thesis and then develops the hypotheses, which are based on the research questions stated in chapter two. The literature review (cf. chapter two) presents an important brick for the construction of the six claims during the current chapter. These hypotheses build the corner stone of this thesis and reflect the expectation of the author with regard to the influences of investigated events on stock price dynamics.

3.1 Scope

The scope sets the boarders of the study and defines the range of the empirical research conducted in upcoming stages. Furthermore, it implies in which fields the paper contributes to existing work. Thereby, the focus is set on the Swiss merger and acquisition market. More specifically, events are only considered if at least one Swiss company is involved in the transaction. This might either be the bidder or target firm. Furthermore, only the Swiss company is taken into consideration, while the foreign counterpart is neglected. Hence, the paper isolates and investigates only the behavior of the Swiss market.

For the sake of actuality, data is collected for the period from 2008 to 2011. The former date represents the end of the sixth merger wave, which started in 2003 and found an end in early 2008 (cf. section 1.2.3). The raw data is subject to a multistage selection process and described in chapter five. As a consequence, all results and interpretations from the analysis part merely rely to the Swiss market for the post period of the sixth merger wave. During this time, capital markets were strongly influenced by the subprime crisis and its subsequent effects.

3.2 Six hypotheses

This section determines the extent and specificity of the conducted empirical research during following chapters. The different hypotheses have their roots in the empirical findings of scientific research as presented in chapter two combined with logical intuition and financial theories. In a general sense, the thesis aims to confirm the global and theoretical expectations for the Swiss corporate takeover market.

Hypothesis 1 (re: target shareholders): Swiss corporate transactions do create a significant cumulative abnormal return around the short-term event window[5] for the target shareholders.

Hypothesis one refers to the obvious findings in empirical literature, which state consistently significant positive abnormal returns for target firms. As figure 5 presents, the empirical findings from past research are distinct and manifest hypothesis one. Therefore, the thesis expects the same average reaction for the shares of a Swiss target company as for international firms on the global capital markets.

Hypothesis 2 (re: acquirer shareholders): Swiss corporate transactions do create a significant cumulative abnormal return around the short-term event window for the acquirer's shareholders.

Hypothesis two is supported by recent empirical findings from the European and a major share of the global market (cf. figure 5). As stated within section 1.2.2, a major advantage of corporate investors is to improve a zero-NPV investment by creating synergies through the combination of the involved companies. Bacon and Von Gersdorff (2009) find that bidding firm investors interpret a corporate takeover as a positive event, since it should enhance future company growth. Therefore, the paper expects that the shares of the bidding firm are able to catch some part of this advantageous effect. This leads to the expectation that Swiss bidding firms receive a positive abnormal return.

Hypothesis 3 (re: total shareholders): The target's shareholders capture a significant superior part of the overall abnormal return generated from the corporate takeover compared to the acquirer's shareholders within the Swiss market.

Hypothesis three has its roots in the comprehensive findings within international empirical research, which states that target shareholders receive the lion share out of the generated value from a corporate takeover (cf. section 2.2). This means that the bidder has to pay the major part of the expected value of the synergies to the target company's shareholder.

[5] The term short-term event window is specified in section 4.1.

Hypothesis 4 (re: cross-border transactions acquirer shareholders): Cross-border transactions do create identical value as domestic transactions for the shareholders of a Swiss bidding company.

Hypothesis four is based on the assumption that the Swiss market is well integrated in the global financial markets and therefore, shareholders of bidding companies are not affected by diverse value enhancing or restraining effects discussed in section 2.2.1. This hypothesis should not quantify or test any level of integration of the Swiss financial markets. It is rather used to find empirical evidence, if the created value is identical for cross-border and domestic transactions. Within this specific field past empirical research does not find a common denominator and the results are obviously dependent on time period and region (cf. section 2.2.1).

Hypothesis 5 (re: cross-border transactions target shareholders): Cross-border transactions do create identical value as domestic transactions for the shareholders of a Swiss target company.

Hypothesis five is based on the same ground as hypothesis four and tests if a Swiss target company is as well influenced by the value enhancing and restraining effects described in section 2.2.1. Harris and Ravenscraft (1991: 827) underline that the abnormal return on target companies does not differ between domestic and cross-border transactions given that capital and factor markets are not segmented internationally.

Hypothesis 6 (re: method of payment): The shares of a Swiss bidding company exhibit an increasing abnormal return by raising the stock proportion within the payment of a corporate transaction.

The international empirical evidence justifies hypothesis six. Additionally, it assumes that shareholders of the bidding company prefer total stock payments to mixed and cash-only payments (cf. section 2.2.2). Therefore, the paper assumes that the negative reaction from the signaling effect does not influence the abnormal return sufficiently to result in a zero effect. This internationally accepted rule is tested for the Swiss market within hypothesis six.

4 Methodology

In the context of this paper, the methodological framework for the empirical examination of the stated hypothesis in chapter three is set by the event study approach. This method is often used to analyze stock price reactions of relevant enterprises to various events of interests (Degryse, Moshe and Ongena, 2009: 10). Serra (2002: 3) defines event study methods as econometric techniques used to estimate and draw inferences about the impact of an event in a particular period.

Werner (2010: 53) adds, the general idea is, assuming efficient capital markets, that the stock price of a company immediately reflects the economic importance of an event. This implies that the event study methodology allows testing for two main purposes. On one side, one is able to test the efficiency of the stock markets, more specifically if the security prices fully reflect all available information upon their announcement (Brown, Elton, Goetzmann and Gruber, 2011: 397). This form is generally known as the semi-strong form of market efficiency (Alexander, Baily and Sharpe, 1999: 93). On the other side, one can investigate the influence of specific events on the stock price and their wealth contribution to existing stockholders (Binder, 1998: 111).

The structure presented in figure 6 has become the norm for most empirical event studies during the most recent decades.

Figure 6: Structure of an event study

Step	Action	Section
1.	Define the exact event date as well as the event and estimation window	4.1
2.	Characterize expected returns in absence of firm specific news	4.2
3.	Measuring abnormal returns	4.3
4.	Aggregating abnormal returns across firms and time	4.3
5.	Testing aggregated returns to determine their significance	4.4
6.	Regressing transaction characteristics on abnormal returns	4.5

Source: own creation based on Henderson (1990: 284) and Bowman (1983: 563)

The initial step is to identify the events of interest. Based on the purpose of this paper this is the first public announcement of a merger or acquisition event (cf. section 4.1). The specific details with

regard to this step are concluded in the data part (cf. chapter five). Secondly, the estimation of the returns regarding the individual companies in absence of the analyzed announcement is conducted. Therefore, one has to choose between different statistical or economic models. A discussion regarding the appropriate model is held in section 4.2.

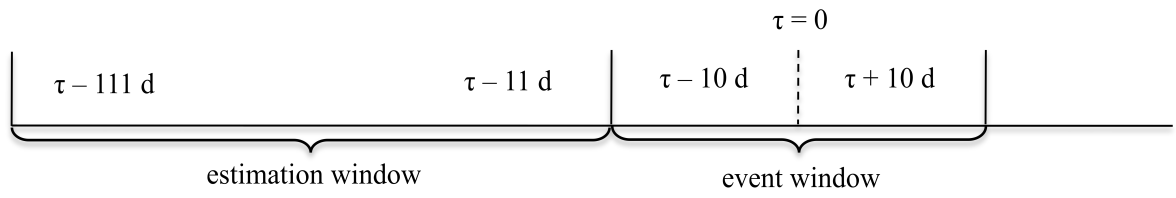
After assessing the theoretical expected return, the excess return, also called abnormal return, is calculated in a third step within section 4.3. Further on, the abnormal returns are aggregated across firms and time and tested if they are significant on a reliable level (cf. section 4.3 and 4.4). Finally, numerous regressions are run to identify the real value drivers of possible abnormal returns (cf. section 4.5).

4.1 Event and estimation window

The event window is the time frame over which stock price movements are investigated. In general, this process begins before the event and lasts until a defined period after the event (Dunbar and Tabak, 1999: 4). In contrast, the estimation window is used to estimate the parameters for calculating the price movements during the event window (Dunbar and Tabak, 1999: 5).

Starting with the **estimation window**, Henderson (1990: 291) states that there are essentially four choices for the estimation period: before the event window, during the event window, after the event window, and around the event window. The lion's share of event studies focuses on the period before the event window for estimation purposes. In addition, MacKinlay (1997: 20) mentions that it is typical for the estimation and event window that these do not overlap (cf. figure 7).

Figure 7: Estimation and event period within current event study



τ: represents the event day

d: abbreviation for days

Source: own creation based on MacKinlay (1997)

Furthermore, the inclusion of the event window, within the estimation for the normal model parameters, leads to biased estimators where the returns would capture the influence from the event. This is problematic because the approach is based on the fact that the event impact is captured solely by the abnormal returns (MacKinlay, 1997: 20). Armitage (1995: 34) concludes that by using daily-based time series, the estimation window should range from 100 to 300 days. However, there exists a trade-off by lengthening the estimation window and getting a greater precision of the estimators compared to more up to date coefficients. To minimize the chance that a company undergoes a major change in its profitability or line of business during the estimation window (Krivin, Patton, Rose and Tabak, 2003: 3) and by using Armitage's (1995: 34) rule of thumb that "100 days or more seem safe", the thesis sets the estimation period to the lower range of 100 trading days as depicted in figure 7, where τ represents the day of the event announcement. Therefore, time-series data beginning 111 trading days before the event date is used and collected as described in chapter five.

In contrast to the rigid estimation window, the effect of stock prices over the **event windows** is captured over different periods within the analysis part. They range from simply the event day (AR0) to a twenty-one days window (CAR-10/10) including the ten trading days prior and after the announcement date (cf. figure 7). The measuring of the impact prior to the event date should capture effects from rumors, information leakages, or insider trading (Marynova and Renneboog, 2008: 2153).

4.2 Discussion of appropriate model for the normal return estimation

By implementing the event study methodology different models for estimating the expected return are applicable. The basic concept is to find the theoretical normal return of the stock over a defined model and compare the estimation with the effective return. Therefore, the computed theoretical return serves as a benchmark and is by definition dependent on the chosen model. However, the right selection often receives little or no discussion, even though the evidence shows that the choice can influence the final results (Armitage, 1995: 26).

By monitoring different event studies, the use of various models is observed (cf. Martynova and Renneboog, 2008: 2154). MacKinley (1997: 17) groups the approaches loosely into two categories – economic and statistical models. While the former group relies on assumptions concerning the investors' behavior, the latter is uniquely based on statistical assumptions. In practice, the use of economical models brings automatically the necessity of statistical assumptions. The following sections discuss some of the eligible models and finally present the most appropriate approach to use within instant context.

4.2.1 Economic models

Two common economic models are the capital asset pricing model (CAPM) and the arbitrage pricing theory (APT).

The **APT** is an asset-pricing model where the expected return of a given asset is a linear combination of multiple risk factors (MacKinley, 1997: 19). Using this model, the theory assumes to make riskless profits by implementing different investment strategies and using securities that are mispriced and identified by the APT (Bodie, Kane and Marcus 2007: 227). MacKinley (1997:17) concludes that the most important variable within the APT is the market factor, while the other factors add rather minor explanatory power. [6] Kummer and Hoffmeister (1978) as well as Danbolt (2004) use the **CAPM** in their studies for modeling the expected return. This famous approach, which was developed in the early 1960 by Treynor, Sharpe, Lintner, and Mossin, calculates the relationship between the risk, measured by the securities beta, and equilibrium expected returns on risky assets. It is based on several simplifying assumptions, which ignore many real world implications. However, it allows for adding more complex features and therefore creating a reasonably realistic and comprehensible model (Bodie et al., 2007: 204f). Fama and French (1996) conclude that the use of the CAPM produces a dependence of the outcome to the different imposed restrictions on the model. [7]

4.2.2 Statistical models

Walker (2000) as well as Healy, Palepu and Ruback (1992) have applied the so-called **market adjusted model** (cf. Martynova and Renneboog, 2008: 2154) for analyzing US data during the fourth merger wave. Walker (2000: 59ff) uses cumulative market-adjusted returns (CMAR) and cumulative matched firm adjusted returns (CMFAR) regressed on different characteristics of the event to evaluate stock price performances over the ordinary least square (OLS) approach.

A rather simplistic model, for analyzing share repurchases over tender offers, is used by Lakonishok and Vermaelen (1990). Therein, they assume that a stock i will earn the market rate of return, R_{mt}, over any period t. Therefore:

Equation 1: $$AR_{it} = R_{it} - R_{mt}$$

where AR_{it}, is the abnormal return and R_{it} is the actual return of the share. Armitage (1995: 27) calls this approach the **index model**.

[6] For a more elaborate discussion of the APT approach see for example Ross (1976).
[7] For a more elaborate discussion of the CAPM approach see for example Bodie, Kane and Marcus (2007).

Constitutive on the index model, the regularly called **market model**[8] or single-index model assumes a stable relation between the market return and the security return (MacKinlay, 1997: 15 and Bilbao, Arenas, Rodriguez and Antomil, 2007: 829). The estimation of the parameter is done by OLS regression. An enhancement of the market model is the **multi factor model**. This approach is motivated by the benefit of reducing the variance of the abnormal return by including further variables as industry indices (cf. MacKinlay, 1997: 18). MacKinlay (1997: 18) concludes that the gains from using multifactor models for event studies are minor as the marginal explanatory power of additional factors is small.

These different arguments regarding the statistical models imply that the use of the market model seems most appropriate. It emphasizes the balance of complexity and costs the most sensible way. Furthermore, costs of additional factors within the economical models (cf. section 4.2.1) do not outweigh the additional benefits provided. The choice is supported by the fact that the market model has been frequently used within recent merger and acquisition event studies (cf. Martynova and Renneboog, 2008).

4.2.3 Market model

After identifying the market model as the suitable fit for estimating normal returns, section 4.2.3 provides the basic understanding that later interpretations can be assessed appropriately. Sharpe constructed an approach, which supposes to relate each return of an asset, in a greater or lesser extent, to the variations in the return on a market index (Bilbao et al., 2007: 829). Alexander et al. (1999: 181) define the market model for estimating the normal return in the following way:

Equation 2: $$R_i = \alpha + \beta R_m + \varepsilon$$

where,

R_i = return on security *i* for some given period

R_m = return on benchmark *m* for some given period

α = intercept term

β = slope term

ε = random error term

[8] This approach is named differently through the scientific literature. Within this paper the term single-index model and market model represent the same concept. For a more elaborate discussion on the differences between the single-index model and the different market model consult Brown, Elton, Goetzmann and Gruber (2011: 152).

While α and ε are the components of the company's return that are autonomous of the market, β captures the expected change in R_i given a change in R_m. Therefore, the market model breaks the normal return into two parts, a market independent and a market dependent fraction (Brown et al., 2011: 132f). Furthermore, Sharpe (1963: 281) makes the assumption that the covariance between the different random error terms of the different securities equals 0, which means that the error terms are completely uncorrelated. Brown et al. (2011: 133) imply that the only reason why stocks move together in a systematically way, is because of a common co-movement within the market. Therefore, there are no other effects included beyond the market that account for co-movement among securities. Bilbao et al. (2007: 829) state that this is the key assumption of the market model. Finally, MacKinley (1997:17) adds that even though this is a strong assumption, it should hold in practice.

Estimating the α and β parameters for each stock is one crucial piece of finally finding the abnormal return. Since there is evidence that historical betas provide useful information about future betas, past time series data is employed to estimate the needed parameters over the estimation window defined within section 4.1 (Brown et al., 2011: 139). MacKinley (1997: 20) proposes to use the ordinary least square approach (OLS), which should represent a consistent estimation procedure for the market model, in computing the parameters.

Hence, one applies following equations for parameter approximation including return data from the stocks under investigation and from the appropriate market index. Equation 3 presents the calculation for estimating the beta parameter of an individual stock.

Equation 3:
$$\beta_i = \frac{\sigma_{im}}{\sigma_m^2} = \frac{\sum_{t=1}^{n}\left[\left(R_{it} - \overline{R}_i\right)\left(R_{mt} - \overline{R}_m\right)\right]}{\sum_{t=1}^{n}\left[\left(R_{mt} - \overline{R}_m\right)^2\right]}$$

where,

σ_{im} = covariance between the stock and the market index

σ_m^2 = variance of the market index

R_{it} = daily return of individual stock at t

$\overline{R}_i$ = average return of individual stock

R_{mt} = daily return of market index

$\overline{R}_m$ = average return of market index

Empirical studies find that the future betas tend to convergence to one, which is the beta of an average-systematic-risk security, than to its estimated beta computed by previous equation (McLeavey, Pinto, Robinson and Stowe, 2009: 115). Therefore, an adjustment of the raw beta is recommended towards one by using the commonly used approach of weighting the raw beta with a factor of two thirds and adding one-third to the weighted raw beta. This leads to the adjusted beta presented in Equation 4.

Equation 4: $$\beta_{adj} = \left\{\left(2/3\right) \times (\text{raw beta})\right\} + \left(1/3\right)$$

This paper uses both beta values during the empirical analysis part (cf. chapter six). Having estimated the beta value, one is able to predict the alpha, which is the intercept within equation 2, using following formula.

Equation 5: $$\alpha_i = \overline{R_i} - \beta_i \overline{R}_m$$

Brown et al. (2011: 142) advise that the alpha and beta values are only estimates of the true alpha and beta that exist for each stock. Thus, these parameters are subject to estimation errors. The fact that the data normally is not stationary over time, due to changes in fundamental data of the company, adds more complexity to the estimation process. However, Brown et al. (2011: 142) mention that previous approach is the most appropriate for forecasting the regression parameters.[9] Additionally, by holding the estimation period as short as possible, the disadvantageous effect of non-stationary is reduced (cf. section 4.1).

Having estimated the necessary elements for the market model allows calculating the abnormal return as described in the following section.

4.3 Measuring and aggregating the abnormal return

Using the previously introduced market model allows to estimate the normal return over the defined event window. More specifically, it computes the return that was expected from the market over the specified period. Hence, equation 2 provides the foundation for the calculation of the abnormal return, which is represented by the error term (MacKinlay, 1997: 20).

[9] For a more elaborate and comprehensive discussion on the accuracy of historical estimates see for example Brown, Elton, Gruber and Goetzmann (2011: 142f).

Therefore, equation 6 presents a restated form of equation 2 for the purpose of finding the abnormal return. The parameters α and β are marked with an additional cap, indicating that these are estimates and not the real values.

Equation 6: $$AR_{it} = R_{it} - \hat{\alpha} - \hat{\beta}_i R_{mt}$$

The error term is now called the AR_{it}, which represents the abnormal return of stock i on day t.

To provide evidence that the measured outcomes are not just one-time effects happened to the specific company, the abnormal returns are aggregated across the different event, which is defined as cross-sectional aggregation (cf. equation 7). Furthermore, the average takes into account that a specific event may have an ambiguous effect on different firms (Schweitzer, 1989: 17). Therefore, the paper assumes that clustering of the events is not a problem. This issue is further discussed in section 7.1.5.

Equation 7: $$\overline{AR}_t = \frac{1}{N} \sum_{i=1}^{N} AR_{it}$$

where,

$\overline{AR}_t$ = average abnormal return at t

To catch the aggregated return over a period, more specifically over the event window, the cumulative abnormal return is calculated by simple adding the daily average abnormal returns up using the following equation (MacKinley, 1997: 24):

Equation 8: $$\overline{CAR}_{t1,t2} = \sum_{i=t1}^{t2} \overline{AR}_t$$

where,

$\overline{CAR}_{t1,t2}$ = cumulative abnormal return over the period t1 to t2

This approach is mainly used within the literature and was already applied by Fama, Fisher, Jensen and Roll (1969) for their famous event study about efficient markets. According to Henderson (1990: 297) this methodology has withstood the test of time. Up to this point, the paper has provided the

knowledge to compute the abnormal effects realized during a corporate transaction. In section 4.4 their significance is tested, which assures that the results are reliable and different from zero.

4.4 Testing the aggregated return

The final step within an event study is to test the significance of the abnormal returns (Hernderson, 1990: 286). This test builds the main tool for accepting or rejecting the hypotheses stated in chapter three. Since it is a crucial element for justifying the findings, Armitage (1995: 26) points out that it is important to choose the most appropriate testing method. The scientific literature covers mainly two kinds of tests, namely parametric and non-parametric approaches.

On one hand DeFusco, McLeavey, Pinto and Runkle (2004: 622) describe a parametric test as a tool that is concerned about parameters, which are dependent on a certain set of assumptions. For instance, the mean or variance is a parameter, while the distribution of the population producing the sample is a specific assumption. On the other hand, a non-parametric test is not worried about certain parameters and only makes minor assumptions about the population (DeFusco et al., 2004: 622).

DeFusco et al. (2004: 622) state that the latter kind of tests are mainly used when the data does not meet the distributional assumptions, the data is given in ranks or when the tested hypotheses do not concern a parameter. The second and third points mentioned do definitely not comply with the data set used for this paper. Furthermore, the paper assumes that the distributional requirements for parametric tests hold. Serra (2002: 4) summarizes these as follows. The abnormal returns of the specific events are normally distributed and the residuals are not correlated across securities, meaning that there is cross-sectional independence (cf. section 7.1.5).

In conclusion, this paper applies the parametric t-test to assess the significance of the computed abnormal returns. Berry, Gallinger and Henderson (1990) underline that this is an appropriate instrument for event studies. Additionally, Henderson (1990: 298) remarks that non-parametric tests are an unnecessary complication and do not work satisfactorily.

While the statistical software SAS Enterprise computes the test statistics, the paper presents in the following section a short overview for providing the main intuition behind the t-test.

Equation 9: $$t = \frac{\hat{\beta} - \beta}{se(\hat{\beta})}$$

where,

$\hat{\beta}$ = estimated parameter or abnormal return

β = value tested against

$se(\hat{\beta})$ = estimated standard error of the parameter or the abnormal return

Under the assumption of normality the variable t from equation 9 follows the t-distribution with n-2 degrees of freedom (Gujarati and Porter, 2009: 109ff and DeFusco et al., 2004: 593f). The β value from equation 9 depends on the hypothesis that has to be tested. However, within this paper the estimated betas are normally tested against zero. Using the computed t-value and a corresponding t-table, one may obtain the level of significance of a certain parameter or abnormal return. Based on this number, one is able to reject or accept a stated hypothesis (Gujarati and Porter, 2009: 115f).

In order to obtain a distinct impression about the magnitude of the result, the thesis always provides the p-value or probability, respectively. It represents the lowest significance level at which a parameter is different from zero (Gujarati and Porter, 2009: 835). This value is calculated by SAS Enterprise and is based on the t-value calculation. The advantage of using this indicator is that no table of significance is needed.

4.5 Regression technique

By conducting different regressions, the thesis tries to explain the abnormal returns by different variables as claimed by hypotheses four to six (cf. chapter three). Therefore, the computed abnormal return is regressed on various variables. The regressions are implemented by using the OLS-method. This approach is one of the most powerful and popular methods of regression analysis (Gujarati and Porter, 2009: 55) and is as well used in section 4.2 for estimating the parameters within the market model.

The thesis makes the use of dummy and continuous variables during the analysis part. Dummy variables classify the data into mutually exclusive categories (Gujarati and Porter, 2009: 278).

Therefore, the estimated parameter from the dummy variable describes the magnitude of a level shift of the intercept.[10] Parameters estimated from continuous variables indicate the change of the dependent variable by increasing the continuous variable by one unit and holding everything else constant. The specific variables used within the regressions are more precisely described in section 5.4. Finally, this chapter should provide the reader with the basic understanding of the methodology used within this thesis. For the sake of simplicity, further minor technical descriptions used during the analysis part are provided within the related sections.

[10] For a more elaborate and comprehensive discussion on dummy variables see for example Gujarati and Porter (2009: 277).

5 Data

The hypotheses formulated in chapter two are claims that have to be proofed by a sample of real events. Therefore, a set of data is collected, which allows testing the stated hypotheses. Current section builds a crucial part of the paper since the complete analysis is dependent on the accuracy of the chosen data and thus, the inferred results are just as reliable as the underlying sample.

Figure 8: Process of data collection

	2008	2009	2010	2012	**Total**	**Section**
Number of deals in compliance with KPMG criteria (cf. section 5.1)	312	276	262	316	**1166**	
Selection process 1						**5.2**
Number of deals	28	18	20	18	**84**	
Selection process 2						**5.3**
Number of deals	13	12	15	12	**52**	
Completion of data base						**5.4**

Source: own creation and partly based on KPMG (2009; 2010; 2011a; 2012)[11]

Chapter five offers an insight into the data gathering and is aligned to this process (cf. figure 8). In conclusion, the final data set is an outcome of three major steps used for filtering the general database (cf. section 5.2 to 5.4). This leads to a final data sample of 52 events that conform to the specified characteristics. During the following sections, the paper explains the iterative process of finding the appropriate data sample.

5.1 Database for Switzerland

The M&A Yearbooks 2009 (KPMG, 2009), 2010 (KPMG, 2010), 2011 (KPMG, 2011a) and 2012 (KPMG, 2012) build the foundation of the database. These comprise announced M&A deals within the Swiss market, which fulfill the following criteria defined by KPMG:

- Deal value is greater than or equal to the equivalent of USD 7 million (KPMG, 2009; 2010; 2011a; 2012)

[11] Due to diverse selection criteria from KPMG the number in figure 8 diverges from the total number of Swiss M&A transactions announced in section 1.2.4.

- Where no deal value has been disclosed, if the turnover of the target is greater than or equal to the equivalent of USD 14 million (KPMG, 2009; 2010; 2011a; 2012)
- Where a stake of greater than 30% has been acquired in the target. If the stake is below 30%, only when the value exceeds the equivalent of USD 140 million (KPMG, 2009; 2010; 2011a; 2012)
- Activities excluded from the data are restructurings where ultimate shareholders' interests are not affected and public mandatory offers that are not recommended by the board (KPMG, 2009; 2010; 2011a; 2012)
- Letters of intent, heads of agreement and other non-binding agreements are not included (KPMG, 2009)
- All deals included have been announced but may not necessarily have been closed (KPMG, 2011a; 2012)

Using these criteria, KPMG finds a total of 1166 merger and acquisition events spread over the years 2008 to 2011. The events are more or less equally distributed over the investigated period (cf. figure 8).

KPMG separates the deal announcements into following different industry-categories, which were adopted for the use of this paper (KPMG, 2012):

- Industrial Markets
- Consumer Markets
- Healthcare and Life Science
- Technology, Media and Telecommunications
- Financial Services
- Chemicals
- Other Industries

However, KPMG (2012) discloses that the allocation of the events to the specific industries is based on their subjective judgment. For the analysis part, the industries are merged to have a meaningful size of data per each industry set. Therefore, the sectors industrial markets as well as technology, media and telecommunication sum up as **cyclical industry**. In addition, the sectors consumer markets, chemicals and healthcare and life science are pooled as **non-cyclical industry**. Due to the special

characteristics of the **financial sector**, this industry is not combined with another one. Same approach applies for the category **other industries** defined by KPMG.[12]

5.2 Selection process 1

The following criteria are implemented in a first step to filter applicable data that fit for the purpose of an event study, more specifically for the tests conducted within chapter six:

- Only Swiss companies are considered. More specifically, within cross-border transaction, only the Swiss party is added to the data set
- Only deals involving listed companies are included, since regularly traded stock prices are required to measure the magnitude of the abnormal returns (cf. chapter four)
- Only transactions bigger or equal to USD 200 million are considered. Transactions with no published deal size are out of scope and do not qualify for further recognition. This fact is crucial, since the deal price may have an influence on the abnormal return and therefore is a material prerequisite

After accounting for prior conditions, 84 events are left from the database of KPMG. The distribution of the different events is still more or less equal over the yearly time period from 2008 to 2011 (cf. figure 8).

5.3 Selection process 2

As mentioned in chapter three, the main goal is the measurement of abnormal return of stock prices caused by merger and acquisition announcements. Thus, it is important to work with time series data that is only influenced by such defined events. McWilliams and Siegel (1997: 634) mention the issue of confounding effects, which influence the analyzed share price and hence make accurate inferences with regard to the stated hypotheses impossible. Typical confounding effects arise for example from the declaration of dividends or the announcement of unexpected earnings.

It is self-explanatory that a longer event window enhances the possibility of such disturbing effects (McWilliams and Siegel, 1997: 634). To eliminate unfavorable influences of the stock price, possible confounding effects are searched ten days prior and after the event date. Therefore, company

[12] The author is aware of the fact that the categorization is discussable. However, within current context, this approach seems to be most sensible.

homepages, Bloomberg news and other online sources have been screened with regard to the following criteria proposed by McWilliams and Siegel (1997: 634):

- No publication of quarterly, half yearly or yearly company results
- No other merger and acquisition publication
- No declaration of dividends and publication of unexpected earnings
- No filling of a large damage suit or change in a key executive

By processing this step, the paper aims to develop a "pure" data sample without any disturbances within the time series. However, this is only a fiction, since stock prices are continuously influenced even by company unrelated information. As presented in figure 8, the final data sample includes 52 events, which are qualified for the use of the event study conducted in chapter six. Furthermore, it is crucial to identify the first announcement date as exactly as possible to catch the whole reaction of the stock price (Dodd, 1980: 107).

Dodd (1980: 107) mentions that the date of the merger approval by the target shareholders is useless for this approach of study, since up to this point, most of the information has already been released and hence, is included in the stock price. Therefore, the data delivered from the M&A Yearbooks of KPMG is justified within this second selection step by consulting company homepages and other online sources and inaccurate information is adjusted. The final data sample and the adjustments are recorded in the appendix (p.VI).

5.4 Completion of data sample

Having worked out this final sample, several deal specific characteristics are added to the events. These characteristics are used for the OLS-regressions conducted in chapter six. The prepared variables are presented more accurately within this section of the paper. First, the **cross-border** remark defines if the transaction is national or international. An international deal includes a non-Swiss company as bidder or target. National transaction is specified as a deal between two Swiss companies.

As figure 9 presents, there is a total of thirty-nine cross-border deals whereof ten events are related to target companies and twenty-nine events concerning bidding firms. The total number of domestic deals gathered is thirteen, while five events are related to the target company and eight events concern the bidding firm.

Figure 9: Summary of events regarding the nature of the events

Nature of deal	Cross-border deals	39	Target	10
			Bidder	29
	Domestic deals	13	Target	5
			Bidder	8

Source: own creation based on appendix (p.VI)

Secondly, the details about the **means of payment** declare how the deal has been settled. The data contains cash, stock or a mix form as means of payment. The data used within this paper does not contain any other form of payment, i.e. debt security. From the target's company view there are ten cash, three mixed and two stock deals within the sample. Looking at the bidder's side, the sample includes twenty-eight cash, one mixed and four stock payments. Finally, there are four corporate takeovers, which do not disclose the means of payment (cf. figure 10). This mirrors the international findings from Martynova and Renneboog (2009) regarding the predominant share of cash settlements (cf. section 2.2.2)

Figure 10: Summary of events regarding the means of payment

Means of payment	Target	Cash	10
		Mixed	3
		Stock	2
	Bidder	Cash	28
		Mixed	1
		Stock	4

Source: own creation based on appendix (p.VI)

Further on, the **nature of bid** states if the deal is a friendly or hostile transaction. The definition of a hostile and friendly corporate takeover is ambiguous through the scientific literature. Demidova (2007: 45) describes a hostile takeover fairly simple as a deal where the target's management is not willing to sell the company to a new influencing stockholder, while the managers' attitude towards the deal is positive within a friendly takeover. Another definition is used by Branch and Yang (2010: 4). They define a hostile takeover either as deal that was declined by the board but the bidding company

continues pursuing the acquisition or a direct announcement of the offer without prior notice to the target's management or board. Since there is only one unsolicited transaction contained in the data sample, this variable is not of notable use for the purpose of this paper.

In addition, the **deal size** of the transaction is added to the sample. The value offers a view of the absolute magnitude of the deal. However, for getting a relation to the total size of the company the deal value is related to the market capitalization at the event date. The market capitalization or market value is defined as outstanding shares multiplied by the current market price of a single stock (Bodie, Kane and Marcus 2010: 396).

In conclusion, following characteristics are set up and prepared as variables for regressions within the analysis part in chapter six:

- **dummy target** dummy variable that includes all deals concerning target companies
- **dummy bidder** dummy variable that includes all deals concerning bidding companies
- **dummy cross-border (cb)** two dummy variables that include all deals with a non-Swiss transaction party either for the target or the bidding firm
- **dummy nature of bid** dummy variable that includes all friendly deals
- **log deal size** continuous variable of the log of the deal value
- **log market cap** continuous variable of the log of the market capitalization at the event date
- **ratio deal size/market cap** continuous variable of the ratio between the deal value and the market capitalization at the event date
- **ratio means of payment** continuous variable of the ratio between cash share to total payment
- **industry dummies** four different dummy variables for cyclical, non-cyclical, financial and other industries as defined in section 5.1
- **dummy outlier AR0** dummy variable that excludes outliers for the AR0 event window
- **dummy outlier other** dummy variable that excludes outliers for event windows different from AR0

The dummy variables for outliers support correcting for events that do not match the general pattern of the data (cf. appendix: p.VII). This could be due to special circumstances regarding the event. By excluding these data points the paper aims to reduce the noise within the sample. However, if the analysis makes use of outliers then the outcome is always presented in comparison to the result including these points in the data sample.

The presented variables above are comprehensively described in the appendix (p.VI).

5.5 Time series

For estimating the different parameters and computing the abnormal return, time series data is gathered. More precisely, for every company that is included in the final data sample, the daily closing stock market price in Swiss franc is collected for the period from 01.08.2007 until 31.12.2011.[13] Each time series is adjusted for dividend payments over the entire period by adding the dividend on the computed return at the ex-dividend date.

The Swiss Performance Index (SPI) is considered as market benchmark, since it is the most appropriate one (cf. section 7.1.3). The SPI is known as the overall indicator for the Swiss stock market. It includes nearly all listed equities from Switzerland and is a free-float adjusted, capitalization-weighted value index that takes dividend payments into account (SIX, 2012).

[13] For one company (Forbo) the period has been extended up to the 13.01.2012 for capturing the whole event window, since the event date was at the end of the month December 2011.

6 Empirical analysis and interpretation

Previous chapters are strongly interconnected to the empirical analysis and interpretation as they build its foundation. This means that chapter six tests the hypotheses on their accuracy. Therefore, the methodology explained in chapter four is applied for deriving results on the gathered data described in chapter five. Within the following sections the most interesting and meaningful results regarding the investigated hypotheses are presented along with an interpretation of the outcomes. In general, the analysis is conducted over different event windows starting from the event day only (AR0) up to the cumulative abnormal return over a twenty-one day event window (CAR-10/10) that starts ten days before the event day and ends ten days after. For offering a clear and structured overview on the results, only the most relevant outcomes are presented during the following sections.

This chapter tests if the claimed six hypotheses can be accepted or declined. Thereby, the different statements are tested separately and interpreted within each section. In contrast, chapter seven combines the different findings and concludes an overall view on the dynamics of the Swiss corporate takeover market.

6.1 Hypothesis 1 – Stock price reaction of target company

This section investigates the dynamics of the different abnormal returns on the target company by testing following statement:

> *Swiss corporate transactions do create a significant cumulative abnormal return around the short-term event window for the target shareholders.*

The foundation of hypothesis one is build by the vast and distinct global empirical findings, which conclude that shareholders of target companies earn an abnormal return if the underlying company is involved in a corporate transaction.[14]

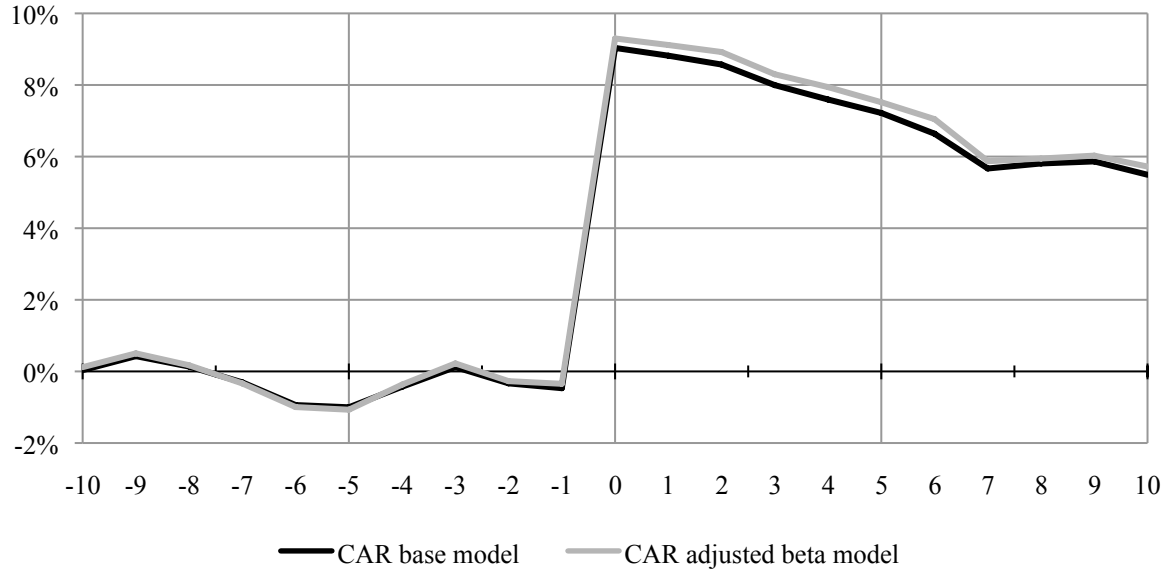
6.1.1 Findings applying ANOVA

The abnormal returns over the twenty-one day event window (CAR-10/10) presents from an efficient market perspective an expected picture as figure 11 shows. Therefore, several indications may be derived. The lion's share of the abnormal return is gained around the event day (AR0). The cumulative abnormal return reverses back to a certain level after the event day. It seems that there is no reaction

[14] Refer to section 2.2 for a more comprehensive discussion about the expected outcome for hypothesis one.

prior to the announcement of the corporate takeover, since the abnormal return closely fluctuates around zero (cf. figure 11).

Figure 11: CAR dynamics of target shares



x-axis: represents the specific day within the event window[15]
y-axis: represents the magnitude of the cumulative abnormal return

Source: own data

Figure 11 further underlines that there is no difference by using the base model or the model, which adjusts the beta for its mean reversion effect during the estimation process of the abnormal return (cf. section 4.2.3). Even though, figure 11 presents some interesting indications, the significances of the different abnormal returns during the various event windows have to be justified. Consequently, the following regression has been run.

Equation 10: $$(C)\,AR = \beta_1(dummy\ target) + \varepsilon$$

In econometric literature Equation 10 is known as an analysis of variance (ANOVA) model. Gujarati and Porter (2009: 278) describe such a model as one that contains one or several regressors, which represent exclusively dummy variables. The equation includes no intercept. Therefore, the dummy variable results directly in the average of the sample and not as the level difference to the omitted

[15] Note that the scale indicates the return level at the closing of the stock exchange.

variable, which would be the bidder events within this specific regression (Gujarati and Porter, 2009: 284).

The average abnormal return on the event day (AR0) is 9.504 percent and highly significant regarding the probability value of 0.0003 (cf. table 1). This significance value means that there is a 0.03 percent probability of committing a type 1 error, or the probability of rejecting a true hypothesis is 0.03 percent (Gujarati and Porter, 2009: 121). One may also refer to confidence intervals, which are related to the probability value by subtracting it from one hundred percent (Kobelt and Steinhausen, 2006: 249f). The 90 percent, 95 percent and the 99 percent confidence intervals are regularly used within empirical studies and therefore as well applied within instant outcome evaluation.

Table 1: AR of target shares

	dummy target (β_1) (p-value)	**standard error**	**t-value**
AR0	0.09504*** (0.0003)	0.02452	3.88
AR0 excl. outliers	0.05430*** (<0.0001)	0.01148	4.73
AR0 adj. β[16]	0.09650*** (0.0003)	0.02463	3.92
AR1	-0.00216 (0.6231)	0.00438	-0.49
AR-1	-0.01263 (0.4419)	0.01630	-0.78

*/**/*** indicate 90% / 95% / 99% confidence intervals

Excluding the outliers from the estimation procedure, which is achieved by adding a dummy that controls for outliers on the event day into equation 10, leads to a more significant average of 5.430 percent with a probability value of smaller than 0.0001. Using the adjusted beta model does obviously not lead to a different interpretation compared to the base model (cf. table 1). While there is a highly significant return on the event day, the abnormal returns on the day prior the announcement (AR-1) and directly after (AR1) are not different from zero. The p-values of 0.6231 and 0.4419, respectively, underline this derivation (cf. table 1).

For investigating a certain event period and not only the specific event day, the paper makes use of the cumulative abnormal return. Therefore, several event periods are evaluated. While the shortest includes four days, the event day and the following three day (CAR0/3), the most extended one considers twenty-one days including the ten days prior and after the event (CAR-10/10).

[16] Abbreviation for the model based on the adjusted beta method (cf. section 4.2.3).

The findings on the Swiss market presented in table 2, are significant for all analyzed event windows. Excluding outliers from the underlying data sample improves the significance consistently. Basically, the shorter the event period the higher are the returns and their reported significances. Therefore, the cumulative abnormal return from the event day plus the consecutive three days result in a 8.464 percent increase of the stock price, which is significant within a 99 percent confidence interval. Extending the event window up to the following ten days after the event day (CAR0/10) leads to a cumulative return of 5.962 percent that is significant within a 90 percent confidence interval. By excluding outliers from the sample data, the average CAR reduces, however, it gets much more reliable than the CAR0/10 that includes the outliers. As within previous section, the use of the adjusted beta does not lead to different insights and the outcomes are in line with the basic model.

Table 2: CAR of target shares over different periods beginning on the event day

	dummy target (β_1) (p-value)	**standard error**	**t-value**
CAR0/3	0.08464*** (0.0032)	0.02737	3.09
CAR0/3 adj. β	0.08666*** (0.0031)	0.02786	3.11
CAR0/5	0.07687** (0.0107)	0.02901	2.65
CAR0/5 adj. β	0.07896** (0.0103)	0.02962	2.67
CAR0/10	0.05962* (0.0922)	0.03473	1.72
CAR0/10 excl. outliers	0.04548*** (0.0071)	0.01614	2.82
CAR0/10 adj. β	0.06126* (0.0863)	0.03502	1.75
CAR1/10	-0.03542* (0.0736)	0.01939	-1.83

*/**/*** indicate 90% / 95% / 99% confidence intervals

The CAR1/10 presents a significant reversion effect with a CAR of minus 3.542 percent. This outcome represents the reaction after the event announcement and is consistent with figure 11.

For getting a comprehensive picture about the generated abnormal returns, also the period prior to the event date is included into the research. Therefore, table 3 presents results from event windows three day before to three days after the event (CAR-3/3) up to an event window that includes ten days in front and after the event day (CAR-10/10).

The cumulative abnormal returns are higher for short event windows than for the longer ones. The tighter the event windows are, the more significant get the different cumulative abnormal returns. This phenomenon is similar to previous findings (cf. table 2).

Table 3: CAR of target shares over different periods around the event day.

	dummy target (β_1) (p-value)	**standard error**	**t-value**
CAR-3/3	0.08423*** (0.0093)	0.03177	2.70
CAR-3/3 adj. β	0.08704*** (0.0081)	0.03156	2.76
CAR-5/5	0.08158** (0.0247)	0.03523	2.32
CAR-5/5 adj. β	0.08571** (0.0205)	0.03583	2.39
CAR-10/10	0.05493 (0.1715)	0.03960	1.39
CAR-10/10 excl. outliers	0.05027** (0.0158)	0.02007	2.51
CAR-10/10 adj. β	0.05832 (0.1517)	0.04007	1.46

*/**/*** indicate 90% / 95% / 99% confidence intervals

The CAR-10/10 that includes twenty-one days around the event windows returns 5.493 percent. However this result is not significant on an adequate level. By controlling for outliers within the data sample, the outcome for the CAR-10/10 decreases to 5.027 percent but gets much more significant and hence more reliable. Furthermore, the adjusted beta model computes similar results as the standard return estimation model (cf. table 3).

6.1.2 Conclusion and interpretation

Summing up these findings, the thesis clearly accepts hypothesis one that states that shareholders of Swiss target companies earn on average a cumulative abnormal return. Hypothesis one is consistently accepted for all short-term windows. However, the magnitude of the CAR is negatively correlated to the length of the event window. This means that there is some effect of reversion over time. Furthermore, an appropriate level of significance for the CAR-10/10 is only assured by controlling for outliers.

As Figure 11 depicts, the main reaction on the stock price is on the event day where target shareholders on average gain a highly significant abnormal return of 9.504 percent. Considering autonomous days prior or after the event day results in insignificant returns, meaning that on single days around the event date only normal returns are generated. However, investigating the CAR over

the ten days after the deal announcement reveals a significant negative reversion effect of minus 3.542 percent. This implies that the efficient market hypothesis does not completely hold for the Swiss market concerning the target company and new information is not immediately reflected correctly in the security prices (Alexander et al., 1999: 93). The decreasing CAR0/10 implies that some adjustment is done after the event day and the first stock price reaction may be too strong. This effect is also indicated by figure 11, where the CAR reverses to a lower level after the event day.

This part of the thesis contributes to the existing international research as it approves and underlines the global findings for the Swiss market. The literature on international event studies regarding corporate takeovers is distinct in finding a positive abnormal return for the target shareholder. However, the magnitude of the effect is ambiguous within prior empirical work, since abnormal returns within present analysis are rather low compared to earlier international research. This divergence to the average international findings might be in connection to the financial crisis that occurred during the analyzed period. Therefore, the paper implies that possible corporate investors were rather risk-averse during this time and did valuate targets with an additional discount compared to previous global M&A events.

6.2 Hypothesis 2 – Stock price reaction of bidding company

This section investigates the dynamics of the abnormal return regarding the bidding company by testing following statement:

> *Swiss corporate transactions do create a significant cumulative abnormal return around the short-term event window for the acquirer's shareholders.*

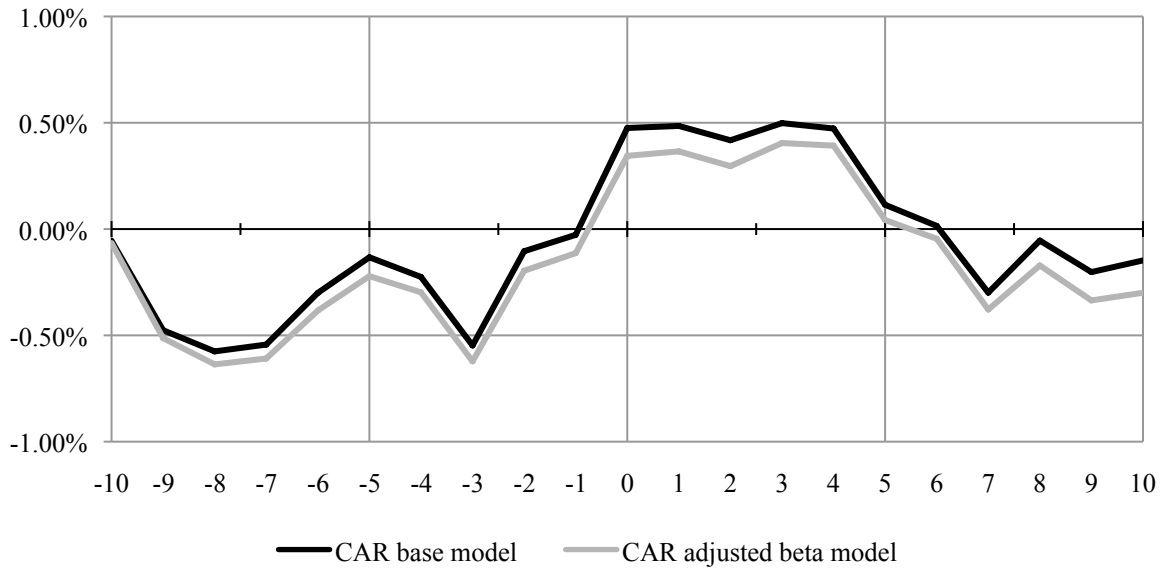
The claim is based on diverse international empirical research. As presented in chapter two, the outcomes are fairly ambiguous. While some papers obtain non-significant abnormal returns, others find negative abnormal returns for the bidding shareholders. However, around 43 percent of the investigated reports uncover a minor significant return for the bidding firm within international corporate takeovers. This is one rationale why this paper expects a significant CAR over the short-term event window for Swiss bidding companies.[17]

[17] Refer to section 2.2 for a more comprehensive discussion about the expected outcome for hypothesis two.

6.2.1 Findings applying ANOVA

Figure 12 presents the cumulative abnormal return over a twenty-one day event window of the bidding company. The reader has to be aware that the y-axis is scaled differently compared to figure 11. This is done for the purpose of visibility. As claimed by hypothesis two, the stock price of the bidding firm shows on average a positive reaction on the event day (cf. day 0 in figure 12). On the consecutive days there is not any reaction, while at the end of the event window the CAR reverses back to zero. This outcome raises the question, if the abnormal return on the event day of 0.503 percent (cf. table 4) is significant and therefore accepts hypothesis two. Furthermore, the post-announcement as well as the pre-announcement effects have to be tested on their significance in order to make reasonable inference.

Figure 12: CAR dynamics of bidding shares



x-axis: represents the specific day within the event window
y-axis: represents the magnitude of the cumulative abnormal return

Source: own data

Additionally, the stocks of the bidding company react in a similar way by using the adjusted beta model for computing the normal returns compared to the base model. This effect is depicted within figure 12.

To test for the significance of the computed returns, the following regression has been run:

Equation 11: $(C)\ AR = \beta_1(dummy\ bidder) + \varepsilon$

Similar as in equation 10 the intercept is excluded. This brings the desirable effect that the beta parameter yields directly in the average for the sample and does not present the level difference to the omitted variable, which is in this model the target company's abnormal return.

Using equation 11 and the relating abnormal returns for each event, is yielding in an abnormal return for the event day of 0.503 percent. However, this abnormal return is clearly not significant regarding its p-value of 0.7782 and therefore not different from the normal return. Same effect holds when outliers on the announcement day are excluded as well when the adjusted beta is used within the market model for estimating the normal return (cf. table 4).

Table 4: AR of bidding shares

	dummy bidder (β_1) (p-value)	**standard error**	**t-value**
AR0	0.00503 (0.7782)	0.01775	0.28
AR0 excl. outliers	0.00438 (0.6197)	0.00877	0.50
AR0 adj. β	0.00465 (0.7996)	0.01788	0.26
AR1	0.00010 (0.9726)	0.00279	0.03
AR-1	0.00077 (0.8567)	0.00424	0.18

*/**/*** indicate 90% / 95% / 99% confidence intervals

Investigating the days before and after the publication of the takeover leads to an average abnormal return of 0.077 and 0.01 percent, respectively. Both are not significant due to their p-values of 0.8567 and 0.9726, respectively (cf. table 4).

Expanding the analysis over a longer period does not lead to improved findings regarding the significance (cf. table 5). The CAR0/3 is 0.526 percent but apparently not different from zero as implied by the high p-value of 0.7830. The output draws the same conclusion by using the adjusted beta model for the CAR0/3. Additionally, accounting for outliers does not amend the significance of the cumulative abnormal returns (cf. table 5).

Table 5: CAR of bidding shares over different periods beginning on the event day

	dummy bidder (β_1) (p-value)	**standard error**	**t-value**
CAR0/3	0.00526 (0.7830)	0.01898	0.28
CAR0/3 excl. outliers	0.00091 (0.9250)	0.00958	0.09
CAR0/3 adj. β	0.00512 (0.7923)	0.01933	0.26
CAR0/5	0.00141 (0.9431)	0.01970	0.07
CAR0/10	-0.00120 (0.9580)	0.02274	-0.05
CAR0/10 excl. outliers	-0.00463 (0.6699)	0.01079	-0.43
CAR0/10 adj. β	-0.00204 (0.9297)	0.02296	-0.09

*/**/*** indicate 90% / 95% / 99% confidence intervals

Considering the CAR0/10 results in a cumulative abnormal return of minus 0.12 percent. Obviously, the algebraic sign changes to minus for the extended time period. This is true for all different specifications, as accounting for outliers and adjusted beta, within the eleven days event window (cf. table 5). Nonetheless, the significance is still not given and all outcomes are consistently indifferent compared to the normal return.

For getting the complete picture about the bidding firm, table 6 contains the results including days prior to the corporate takeover announcement. Taking into consideration the CAR-3/3 leads to a cumulative abnormal return of 0.724 percent by using the standard model.

Table 6: CAR of bidding shares over different periods around the event day

	dummy bidder (β_1) (p-value)	**standard error**	**t-value**
CAR-3/3	0.00724 (0.7342)	0.02120	0.34
CAR-3/3 adj. β	0.00691 (0.7494)	0.02152	0.32
CAR-5/5	0.00414 (0.8612)	0.02358	0.18
CAR-5/5 adj. β	0.00408 (0.8659)	0.02405	0.17
CAR-10/10	-0.00147 (0.9544)	0.02569	-0.06
CAR-10/10 excl. outliers	-0.00508 (0.7020)	0.01321	-0.39
CAR-2/0	0.01023 (0.5823)	0.01848	0.55

*/**/*** indicate 90% / 95% / 99% confidence intervals

Using the adjusted beta model for the computations on the CAR-3/3 brings up a cumulative abnormal return of 0.691 percent (cf. table 6). Similar to previous results, the outcomes for the CAR-3/3 are not significant on a decent level as implied by the p-values of 0.7342 and 0.7494, respectively.

Table 6 further assesses the results for the expanded event windows CAR-5/5 and CAR-10/10. The findings for these event windows underline the one presented before by delivering non-significant outcomes for all periods and model specifications (cf. table 6). More specifically, the CAR-5/5 is 0.414 percent using the normal model, while considering the adjusted beta results in a 0.408 percent cumulative abnormal return. Also accounting for outliers does not improve the significance to an appropriate level. Figure 12 indicates an increasing abnormal return for the CAR-2/0 of around 1 percent. Table 6 proofs this indication, however, the abnormal return is insignificant and hence not different from zero.

6.2.2 Conclusion and interpretation

In conclusion, the thesis can clearly not accept hypothesis two, which states that the shareholders of Swiss bidding companies earn an abnormal return after the announcement of a corporate takeover. This finding is robust for all short-term event windows tested. Therefore, the outcomes contradict the findings from Lowinski et al. (2003), who discovered a significant positive abnormal return over different short-term windows for Swiss bidding companies. However, these effects were computed over an earlier period from 1990 to 2001 and therefore including a different data set.

An interesting point is, that the findings of Lowinski et al. (2003) and the current paper only differ regarding the significance. The magnitudes of the average abnormal returns have a comparable size. Since within both papers the significance level is determined by the t-value, one may imply that the volatility of the abnormal returns increased over the recent period and therefore made the average abnormal returns on bidding companies non-significant.

Finally, the thesis adds to the existing international literature that shareholders of a Swiss bidding company do not gain abnormal returns and therefore shift the economic rent created by value enhancing effects towards the target company. This conclusion is justified for the period after the sixth merger wave, which found an end in early 2008 (cf. section 1.2.3). In addition, one might imply that the volatility of the abnormal returns regarding the bidding companies shares has increased over the recent years. This might be a result from the financial turmoil on the capital markets during the elapsed period.

6.3 Hypothesis 3 – Comparison of involved parties

This section intends to proof that shareholders of the target company receive the lion's share of the abnormal return generated trough a corporate takeover by testing following claim:

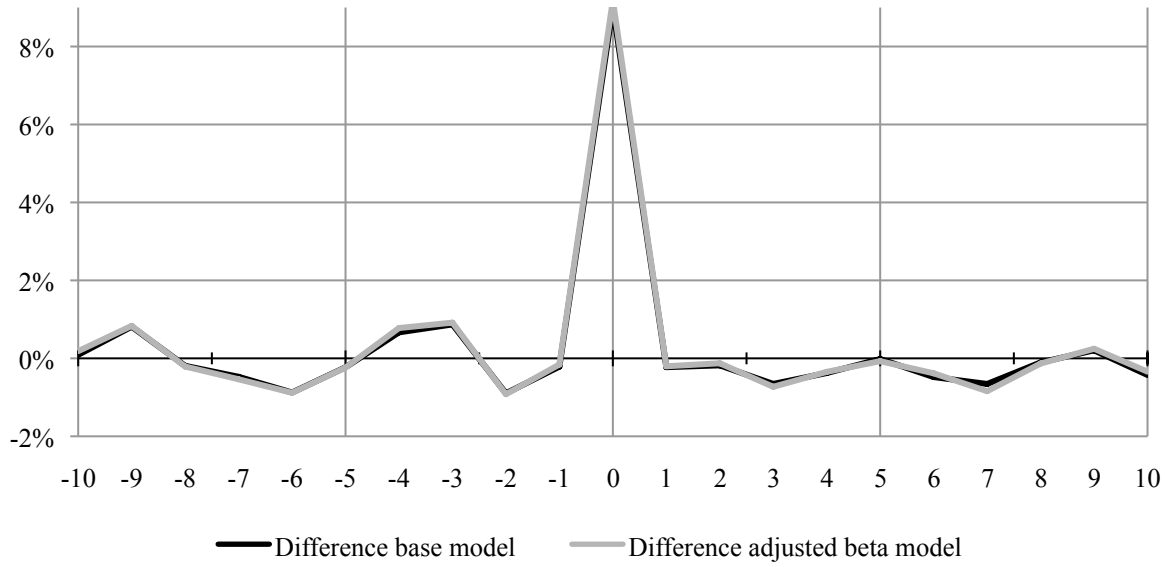
> *The target's shareholders capture a significant superior part of the overall abnormal return generated from the corporate takeover compared to the acquirer's shareholders within the Swiss market.*

The statement has its roots in the combination of hypothesis one and two. Since those state that both parties involved in a corporate takeover pocket an abnormal return. Thus, the difference between the abnormal return of the target and the bidding firm may be of interest for the reader. Therefore, the paper aims to investigate if the disparity has a significant magnitude. However, knowing the results from previous hypotheses the paper does not expect to gain a remarkable value added.

6.3.1 Findings applying ANOVA

Figure 13 draws the difference between the computed average abnormal return between the target and the bidding shares on every day of the event window.

Figure 13: Difference of AR dynamics between target and bidding shares



x-axis: represents the specific day within the event window
y-axis: represents the difference of the abnormal return between the bidding and the target company

Source: own data

It infers, as expected by working through previous hypotheses, that on the event day the target shares outperform the bidding stocks by over eight percent. The difference prior as well as after the announcement of the event is minor and trends around zero. On first notice, the use of the adjusted beta for estimating the expected return does not yield in a different result as depicted by figure 13.

While the difference appears noticeably on the event day, the discrepancy on the remaining days is not as obvious. Therefore, the results have to be tested on their significance to get the needed evidence on the findings by running following equation:

Equation 12: $$(C)\, AR = \beta_0 + \beta_1 (dummy\ target) + \varepsilon$$

As previous models, equation 12 is an ANOVA model. However, it is not a regression through origin since it includes an intercept represented by β_0. This composition of the model offers advantageous characteristics for instant purpose. Now, the intercept represents the mean of the omitted variable. In current equation it is the abnormal return of the bidding company. Additionally, β_1 measures the level difference to the intercept. By adding the beta parameter to the intercept, one obtains the abnormal return of the target company. In addition, the corresponding p-value attests if the intercept and the level shift represented by β_1 are different from zero.

On the event day the target's return is 9.001 percent higher then the bidding company return (cf. table 7). This difference is highly significant as it is attested by the p-value of 0.0035. The intercept of the AR0 model is 0.503 percent and due to its p-value not significant on a decent level. Therefore, as already found previously, the abnormal return of the bidding company's shares is not different from zero on the event day. Similar results are achieved by using the adjusted beta for estimating the outcome.

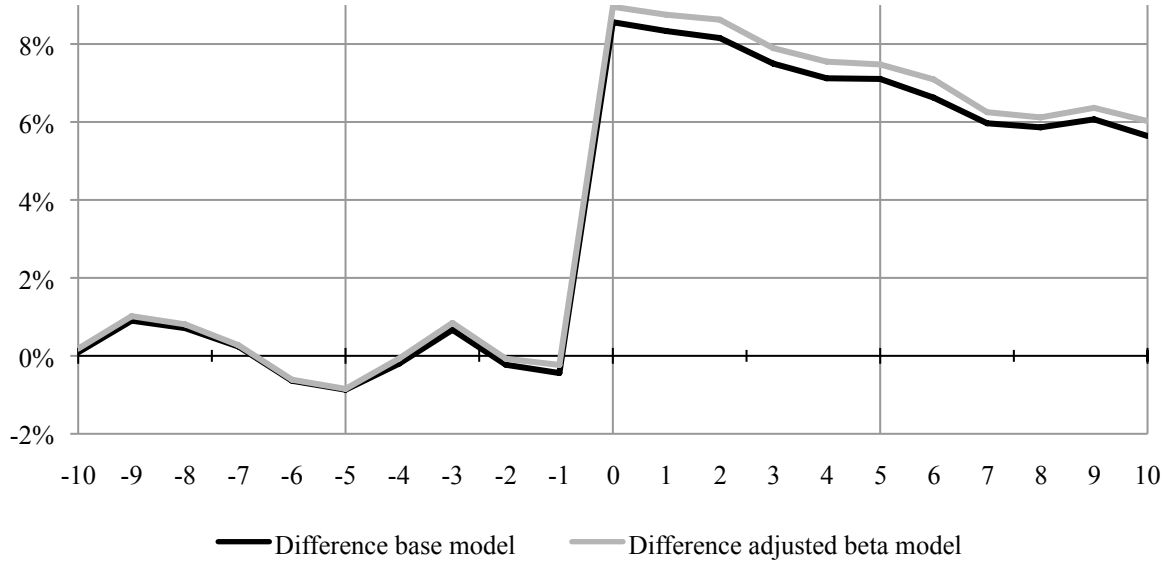
Table 7: Difference of AR of target shares compared to bidding shares

	intercept (β_0) (p-value)	**standard error**	**dummy target (β_1) (p-value)**	**standard error**
AR0	0.00503 (0.7510)	0.0158	0.09001*** (0.0035)	0.0293
AR0 adj. β	0.00456 (0.7743)	0.0158	0.09194*** (0.0030)	0.0294
AR1	0.00010 (0.9728)	0.0028	-0.0023 (0.6680)	0.0052
AR-1	0.00077 (0.8581)	0.0043	-0.0021 (0.7914)	0.0080
AR-3	-0.0032 (0.1459)	0.0022	0.0087** (0.0371)	0.00406

*/**/*** indicate 90% / 95% / 99% confidence intervals

On the day prior to the corporate takeover announcement (AR-1) there is no significant difference of abnormal returns between the involved parties. The bidder earns a 0.077 percent abnormal return combined with a p-value of 0.8581, while the level shift that yields in the target's excess return is minus 0.21 percent combined with a p-value of 0.7914. Same pattern is observed on the day after the event announcement (AR1). Next to the significant difference on the event day, there is also a noteworthy difference on AR-3. The difference of the average return between the parties is 0.87 percent and is associated with a p-value of 0.0371 and therefore significant at a 95 percent confidence interval (cf. table 7).

Figure 14: Difference of CAR dynamics between target and bidding shares



x-axis: represents the specific day within the event window
y-axis: represents the difference of the cumulative abnormal return between the bidding and the target company

Source: own data

While previous part uncovered that there is basically only the event day that presents a significant difference in ARs, figure 14 uncovers a different picture regarding the CAR. To get some evidence on these differences, table 8 presents the results over specified event windows.

The CAR0/10 event window shows that the target shares earn 6.082 percent additional cumulative abnormal return over the eleven days event window compared to the bidding company's shares. By controlling for outliers within the data sample of the target, this CAR reduces to 5.011 percent. While the former CAR has a p-value of 0.1499 and therefore is not significant within a 90 percent confidence

interval, the latter CAR is associated with a p-value of 0.012, which concludes the high significance of the CAR that accounts for the outliers (cf. table 8).

Table 8: Differences of CAR of target shares compared to bidding shares over a specified period

	intercept (β_0) (p-value)	**standard error**	**dummy target (β_1) (p-value)**	**standard error**
CAR0/10	-0.0012 (0.9573)	0.0223	0.06082 (0.1499)	0.0416
CAR0/10 excl. outliers	-0.0046 (0.6480)	0.0101	0.05011** (0.0120)	0.0191
CAR-5/5	0.00414 (0.8556)	0.0227	0.07743* (0.0723)	0.0422
CAR-10/10	-0.0015 (0.9541)	0.0255	0.05640 (0.2398)	0.0474
CAR-10/10 excl. outliers	-0.0051 (0.6866)	0.0125	0.05536** (0.0247)	0.0238

*/**/*** indicate 90% / 95% / 99% confidence intervals

By taking into account the five days prior and the five days after the event announcement, the data delivers a significant difference of the cumulative abnormal return of 7.743 percent in combination with a p-value of 0.0723. Expanding the event window to a twenty-one day period, the CAR-10/10 slightly reverses down compared to the CAR-5/5 including a disparity to the intercept of 5.64 percent. By controlling for outliers within the regression, the outcome results in a level shift of 5.536 percent, which is vaguely smaller than previous value for the overall CAR-10/10. However, due to its p-value of 0.0247 it is significant within a 95 percent confidence interval (cf. table 8).

6.3.2 Conclusion and interpretation

With regard to hypothesis three, which states that the shareholders of the target company earn the lion's share of the total abnormal return generated through a corporate takeover, the paper accepts this statement concerning all investigated cumulative abnormal returns. However, taking specific event days into account, it is obvious that the major difference of the total abnormal return generated accrues on the day of the announcement. The significant difference found on the third day prior to the publication of the corporate takeover cannot be explained by any economically sound reason.

There are several implications discussed in the empirical literature why the target earns almost all of the abnormal return generated through a corporate takeover. For instance, Eckbo and Thorburn (2000:2) mention that fierce competition between companies shift the rents of the merger activity towards the target shareholders. Therefore, higher bidding prices directly reduce the benefits for the bidding company and its shareholders. Franks and Harris (1989) mention that the average bidder is eight times bigger in size as the average target. This implies that the created economic value by the

merger is related to a relatively much bigger asset base regarding the bidder shares compared to the target. Hence, the value creation compared to the higher market value is relatively small and as a result less significant. Eckbo and Thorburn (2000:1) define this effect as attenuation bias. In conclusion, one might deflect that the average Swiss bidding company is considerably bigger than its counterparty.

Hypotheses three contributes in that context to the existing literature that it approves the international findings for the Swiss corporate takeover market. Therefore, it delivers the evidence that Swiss target shareholders receive a significant higher abnormal return in comparison to Swiss bidding firms shareholders.

6.4 Hypotheses 4 to 6 on transaction characteristics

In previous sections the paper computes and tests the overall effects occurring to each party in a corporate takeover using the ANOVA-methodology. Section 6.4 goes a step further and uses the OLS estimation technique to regress the abnormal returns on the different deal characteristics (cf. section 4.5) for estimating various sensitivities.

As already described in chapter three, **hypothesis four** examines if there are differences in the abnormal return, when cross-border transactions are compared to domestic deals. The hypothesis states the following claim:

> *Cross-border transactions do create identical value as domestic transactions for the shareholders of a Swiss bidding company.*

On one hand, it is based on the global empirical evidence gained from earlier empirical studies and on the other hand, on intuitive arguments regarding cross-border transactions. The various findings about international transactions are ambiguous and described in section 2.2.1. However, outcomes from previous research imply that reactions are dependent on the time period. In addition to the scientific findings, the integration of the global financial markets contributes to the fact that domestic and cross-border transactions have to be priced equally. However, if there are dissimilarities in financing opportunities as well as regarding information and integration costs, differences concerning the abnormal returns may result (cf. section 2.2.1).

As the opposite of previous hypothesis, **hypothesis five** considers the effect of cross-border transactions occurring to the target shares by stating:

> *Cross-border transactions do create identical value as domestic transactions for the shareholders of a Swiss target company.*

The foundation for this claim is similar as the one from hypothesis four. Therefore, the paper tries to determine if value enhancing or decreasing effects of cross-border transactions also influence the abnormal return of the target's stock price.

Finally, **hypothesis six** investigates the effect of the means of payment on the abnormal return considering the bidding company, by claiming following statement:

> *The shares of a Swiss bidding company exhibit an increasing abnormal return by raising the stock proportion within the payment of a corporate transaction.*

As all previous hypotheses, hypothesis six is based on previous international research and additionally gives emphasis on the risk-sharing intuition (cf. section 2.2.2). The negative effect of possible information release is assumed to be rather minor compared to the positive influencing ones. The reverse effect of this claim may be that target firms prefer a higher cash ratio.

6.4.1 Findings on hypotheses 4 to 6 applying OLS

This section contains the results regarding the influences of various deal specifications on the abnormal return generated by Swiss bidding and target companies during the defined event window. The section titles indicate if the related chapter refers to the data set of the bidding or target firm. Due to econometrical necessity, the results for hypotheses four to six are presented within the same section, while the interpretation is separately done in subsequent steps for each claim.

6.4.1.1 Sensitivities of bidding companies

Equation 13 is specified to catch the effects on the abnormal return dynamics of the bidding firms' stock over the indicated time period.

Equation 13:
$$(C)\,AR = \begin{aligned} &\beta_0 + \beta_1(cash\ ratio) + \beta_2(dummy\ cb\ bidder) + \\ &\beta_3(dummy\ cyclicals) + \beta_4(dummy\ non-cyclicals) + \\ &\beta_5(dummy\ financials) + \varepsilon \end{aligned}$$

The parameter β_0 represents the intercept. Since the model includes different dummy variables, one has to be cautious with its interpretation as it contains the omitted dummy variable. Hence, it represents the level of abnormal return for domestic transactions within industries different from cyclical, non-cyclical and financial. In contrast, β_1 is a continuous parameter that measures how the dependent variable reacts by changing the proportion of cash as a part of the means of payment. Finally, the remaining parameters are dummy variables that adjust for the intercept level regarding cross-border transactions (β_2), cyclical industries (β_3), non-cyclical industries (β_4) and the financial industry (β_5). The industry dummies act as control variables and are introduced to catch differences between the specified sectors.

Different international empirical studies recommend controlling for such industry effects (cf. Gugler, Mueller, Yurtoglu and Zulehner, 2003 and Georgen and Renneboog, 2002).[18] To get a sound picture regarding the bidding company, equation 13 is also run without controlling for the various industries. In this case the intercept represents general domestic transactions, while the industry dummies disappear.

The sensitivities for specific event days are listed in table 9. Controlling for the specific industries does lead to the following picture. The intercept (β_0) shows an abnormal return of 2.19 percent on the event day (AR0). Due to its p-value of 0.2430 the abnormal return only indicates a trend rather than a

[18] Refer to section 7.1.1 for a short discussion about the inclusion of control variables.

significant return. The cash-ratio (β_1) displays a negative influence of 0.058 percent combined with a p-value of 0.9751 and is therefore equal to zero while no trend can be specified. The dummy for cross-border transactions (β_2) presents a minus 3.566 percent shift coupled with a p-value of 0.0275. Therefore, the difference of the abnormal return in connection with cross-border transactions is significant within a 95 percent confidence interval.

Furthermore, considering the various industries, the dummy for cyclical companies (β_3) reports a level shift of 2.984 percent and a p-value of 0.0863, which is significant within a 90 percent confidence interval. The dummies for non-cyclical companies (β_4) and financial institutions (β_5) may only be used for indications since their p-value do not comply with a 90 percent confidence interval. While the former dummy indicates a positive sensitivity of 1.523 percent, the latter implies a negative relationship of 2.988 percent. Using the adjusted beta model leads to comparable results (cf. table 9).

Table 9: Sensitivities of AR to event characteristics of bidding shares

parameter	**intercept (β_0) (p-value)**	**cash ratio (β_1) (p-value)**	**cross b. (β_2) (p-value)**	**cyclical (β_3) (p-value)**	**non-cycl. (β_4) (p-value)**	**financials (β_5) (p-value)**
AR0	0.02954	-0.00674	-0.02438			
	(0.1071)	(0.7303)	(0.1390)			
AR0	0.02190	-0.00058	-0.03566**	0.02984*	0.01523	-0.02988
	(0.2430)	(0.9751)	(0.0275)	(0.0863)	(0.3510)	(0.1887)
AR0 adj. beta	0.01938	-0.00008	-0.03566**	0.03155*	0.01720	-0.02788
	(0.2969)	(0.9966)	(0.0266)	(0.0689)	(0.2903)	(0.2161)
AR1	-0.00386	0.00618	0.00544	-0.00117	-0.00719	-0.02019
	(0.7115)	(0.5568)	(0.5328)	(0.9020)	(0.4330)	(0.1172)
AR-1	0.01165*	0.00041	-0.01169**	0.00290	-0.00256	-0.01938**
	(0.0871)	(0.9509)	(0.0420)	(0.6330)	(0.6591)	(0.0213)

*/**/*** indicate 90% / 95% / 99% confidence intervals

Without controlling for industry effects, domestic transactions (β_0) result in a slightly insignificant abnormal return of 2.954 percent. Furthermore, the cash ratio and the level adjustment for cross-border transactions are not different from a zero effect. However, β_0 and β_2 allow for drawing some directions and justify the findings from the regression that controls for industries.

On the day after the announcement of the corporate transaction (AR1) none of the results are significant within a 90 percent confidence interval (cf. table 9). On the day prior to the announcement (AR-1) the intercept indicates a positive intercept of 1.165 percent in connection with a p-value of 0.0871. The dummy for cross-border transactions depicts a negative relationship of 1.169 percent that

is significant within a 95 percent confidence interval due to its p-value of 0.0420. Additionally, the dummy variable for the financial industry reports a significant intercept adjustment with regard to the abnormal return of minus 1.938 percent and a corresponding p-value of 0.0213 (cf. table 9).

Table 10 takes different time periods around the event day into consideration. Testing the event day plus the three consecutive days from the event announcement (CAR0/3) leads to an intercept of 5.616 percent that is significant within a 90 percent confidence interval. Additionally, the dummy variable for cross-border transactions and the dummy for financial corporations are slightly insignificant. Both beta values reveal a negative relationship to the cumulative abnormal return (cf. table 10). Considering the period from three days prior to three days after the announcement (CAR-3/3) leads to a significant intercept of 9.418 percent. Furthermore, the parameter for cross-border transactions and the dummy variable for the financial industry are significantly different from zero. Both show a negative level shift to the indicated intercept.

Table 10: Sensitivities of CAR to event characteristics of bidding shares

parameter	**intercept (β_0) (p-value)**	**cash ratio (β_1) (p-value)**	**cross b. (β_2) (p-value)**	**cyclical (β_3) (p-value)**	**non-cycl. (β_4) (p-value)**	**financials (β_5) (p-value)**
CAR0/3	0.04877*	-0.02343	-0.02997			
	(0.0889)	(0.4439)	(0.2404)			
CAR0/3	0.05616*	-0.01191	-0.04209	0.01302	-0.01360	-0.05781
	(0.0793)	(0.7038)	(0.1129)	(0.6473)	(0.6180)	(0.1319)
CAR0/10	0.06570	0.00291	-0.07162*	-0.00272	-0.00346	-0.12076**
	(0.1627)	(0.9501)	(0.0715)	(0.9486)	(0.9317)	(0.0379)
CAR-3/3	0.07575**	-0.03763	-0.04887			
	(0.0405)	(0.3363)	(0.1360)			
CAR-3/3	0.09418**	-0.01464	-0.06900**	-0.00384	-0.02525	-0.10212**
	(0.0208)	(0.7074)	(0.0401)	(0.9135)	(0.4584)	(0.0362)
CAR-10/10	0.05784	-0.01146	-0.06742			
	(0.2493)	(0.8322)	(0.1394)			
CAR-10/10	0.08902*	0.03753	-0.10784**	-0.04443	-0.01714	-0.18563***
	(0.0855)	(0.4609)	(0.0152)	(0.3382)	(0.6976)	(0.0047)

*/**/*** indicate 90% / 95% / 99% confidence intervals

Expanding the event window to a twenty-one day period (CAR-10/10) leads to similar results as the CAR-3/3. However, the dummy variable for the financial industry gets significant on a 99 percent confidence interval and results in a parameter of minus 18.563 percent. Using the adjusted beta model does not lead to different inferences from the data (cf. appendix: p.VIII). By excluding the industry

variables, the outcome results in a significant intercept term for the CAR-3/3 event window, while the other parameters are not significant on a reliable level (cf. table 10).

Different empirical papers handle data from non-financial institutions separately compared to data from companies acting within the financial sector. Due to remarkable differences in capital structure this paper does account for this disparity between financial and non-financial institutions. Consequently, equation 14 tests for the behavior of the stock prices when the data from the financial industry is excluded.

Equation 14:
$$(C)\,AR = \beta_0 + \beta_1(cash\,ratio) + \beta_2(dummy\,cb\,bidder) + \beta_3(dummy\,cyclicals) + \beta_4(dummy\,non-cyclicals) + \varepsilon$$

The parameters of equation 14 have the same economic meaning as they do within equation 13. However, by excluding the data from the financial industry, the dummy for this sector disappears.
Table 11 presents the results on specific days during the event window excluding the data regarding the financial industry. On the event day (AR0) the cross-border dummy is slightly insignificant with a p-value of 0.1014 and a corresponding shift of minus 2.885 percent. In contrast the dummy variable for the cyclical industry reports a significant beta value of 2.987 percent. Using the adjusted beta within the underlying pricing model for the AR0 leads to a significant value for cross-border transactions of minus 2.905 percent. Additionally, the dummy variable for the cyclical industry discloses a shift of 3.158 percent that is significant within a 90 percent confidence interval.

Table 11: Sensitivities of AR to event characteristics of bidding shares excl. financial industry

parameter	**intercept (β_0) (p-value)**	**cash ratio (β_1) (p-value)**	**cross b. (β_2) (p-value)**	**cyclical (β_3) (p-value)**	**non-cycl. (β_4) (p-value)**
AR0	0.03140*	0.00190	-0.02932		
	(0.0705)	(0.9202)	(0.1021)		
AR0 adj. beta	0.03005*	0.00279	-0.02941		
	(0.0828)	(0.8827)	(0.1012)		
AR0	0.01940	-0.00389	-0.02885	0.02987*	0.01483
	(0.2991)	(0.8355)	(0.1014)	(0.0827)	(0.3573)
AR0 adj. beta	0.01696	-0.00329	-0.02905*	0.03158*	0.01681
	(0.3593)	(0.8596)	(0.0969)	(0.0658)	(0.2947)

*/**/*** indicate 90% / 95% / 99% confidence intervals

On the days prior (AR-1) and after (AR1) the takeover announcement no parameter is significantly different from zero. However, the intercept term for AR-1 indicates some direction with a p-value of 0.1488 and a positive level of 0.919 percent (cf. appendix: p.VIII).

By not controlling for the different industries, the paper finds a significant intercept on the event day (AR0). This implies that domestic transactions experience a significant abnormal return of 3.14 percent or 3.005 percent depending on the applied return estimation model. While the parameters for the cash ratio result in non-significant sensitivities, the beta value regarding cross-border transactions allows for making vague inferences (cf. table 11).

Table 12 presents the results for different time periods after and around the event day. Investigating on the period starting on the event day until three days after (CAR0/3) leads to an intercept of 5.011 percent that is vaguely insignificant regarding its p-value of 0.1096. The high p-values of the other parameters indicate that they are not distinguishable from zero. Expanding the controlled period up to an eleven-day event window (CAR0/10) does not make the parameters significant for a decent confidence interval (cf. table 12).

Table 12: Sensitivities of CAR to event characteristics of bidding shares excl. financial industry

parameter	**intercept (β_0) (p-value)**	**cash ratio (β_1) (p-value)**	**cross b. (β_2) (p-value)**	**cyclical (β_1) (p-value)**	**non-cycl. (β_4) (p-value)**
CAR0/3	0.05011	-0.01993	-0.02560	0.01310	-0.01457
	(0.1096)	(0.5212)	(0.3688)	(0.6347)	(0.5815)
CAR0/10	0.05594	-0.01003	-0.04502	-0.00260	-0.00504
	(0.1964)	(0.8164)	(0.2599)	(0.9460)	(0.8911)
CAR-3/3	0.08837**	-0.02233	-0.05317	-0.00377	-0.02618
	(0.0314)	(0.5746)	(0.1508)	(0.9149)	(0.4412)
CAR-10/10	0.08275	0.02922	-0.09075*	-0.04436	-0.01815
	(0.1029)	(0.5607)	(0.0562)	(0.3239)	(0.6709)

*/**/*** indicate 90% / 95% / 99% confidence intervals

The seven-day event window (CAR-3/3) includes the three days prior to the announcement of the corporate takeover. Therein, the intercept results in a positive 8.837 percent parameter with a corresponding p-value of 0.0314 implying significance within a 95 percent confidence interval. The beta value for cross-border transactions reveals a value of minus 5.317 percent. By expanding the event window up to a twenty-one day period (CAR-10/10) the dummy variable for cross-border transaction gets significant with regard to a p-value of 0.0562 and a concerning parameter of minus 9.075 percent. Contrary, the intercept value gets insignificant (cf. table 12). The sensitivity of the

cash-ratio is not different from zero for all event windows. Using the adjusted beta model does not lead to different findings regarding the parameters estimating the cumulative abnormal return (cf. appendix: p.VIII). In addition, by not controlling for industries, the intercept values for CAR0/3 and CAR-3/3 get significant. Therefore, the outcome implies a positive abnormal return for domestic transactions over these event windows. The other parameters are in compliance with the one from table 12 (cf. appendix: p.IX).

6.4.1.2 Sensitivities of target companies

Section 6.4.1.2 tests the sensitivities of the parameters regarding the target firm. For this matter, equation 15 represents the appropriate model.

Equation 15:
$$(C)AR = \beta_0 + \beta_1(cash\,ratio) + \beta_2(dummy\,cb\,target) + \beta_3(dummy\,cyclicals) + \beta_4(dummy\ financials) + \varepsilon$$

Basically, the economic interpretations of the variables are the same as within equation 13. However, the intercept (β_0) contains the level of domestic transactions concerning the non-cyclical industry. Furthermore, the parameter involving cross-border transactions (β_2) concerns the target companies within this equation. The dummy variable "other industries" is not present within equation 15 since there is no data for target companies available from this sector. Table 13 presents the results of the sensitivities on the abnormal return of the target stock price for specific event days. By not controlling for the different industries within equation 15, the cross-border parameter (β_2) parameter reports a significant difference to general domestic deals on the event day (AR0). The outcome results in a minus 16.437 percent level shift and a p-value of 0.0913.

Table 13: Sensitivities of AR to event characteristics of target shares

parameter	intercept (β_0) (p-value)	cash ratio (β_1) (p-value)	cross b. (β_2) (p-value)	cyclical (β_3) (p-value)	financials (β_4) (p-value)
AR0	0.17779	0.03626	-0.16437*		
	(0.1414)	(0.7429)	(0.0913)		
AR0	0.29256	-0.02547	-0.21133*	-0.08708	-0.15281
	(0.1101)	(0.8461)	(0.0759)	(0.5273)	(0.3158)
AR0 adj. beta	0.29741	-0.03041	-0.21193*	-0.08800	-0.14636
	(0.1088)	(0.8191)	(0.0783)	(0.5281)	(0.3413)
AR1	0.00383	-0.00105	-0.00122	-0.00750	-0.02184
	(0.8137)	(0.9331)	(0.9066)	(0.5661)	(0.1433)
AR2	-0.01256*	0.00988*	0.00364	0.00574	-0.00596
	(0.0930)	(0.0860)	(0.4202)	(0.3116)	(0.3339)

*/**/*** indicate 90% / 95% / 99% confidence intervals

Adding the industry dummies leads to a significant difference to non-cyclical domestic deals of minus 21.133 percent on AR0. Furthermore, the intercept level is 29.256, which is marginally insignificant due to the p-value of 0.1101. The other parameters do not reach a sufficient p-value level to infer any directions.

On the day after the event announcement (AR1) the dummy variable for the financial industry reports a level change of minus 2.184 percent with a corresponding p-value of 0.1433 that allows for pointing out some possible direction. The other parameters are due to their high p-values not different from zero. Taking the AR2 into consideration, significant values are found for the intercept that reports a level of minus 1.256 percent and as well for the cash-ratio indicating a sensitivity of 0.988 percent. Both are significant within a 90 percent confidence interval.

Table 14 discloses the results found for event periods from and around the announcement day. Starting with the results for the event day and the consecutive three days (CAR0/3) brings up an intercept value of 27.394 percent and a related p-value of 0.1499. The dummy variable for cross-border transactions reveals a reduction of the intercept of minus 21.087 percent that is significant within a 90 percent confidence interval. By expanding the investigated period up to an eleven day event window (CAR0/10) the intercept and the cross-border variable get less significant, while the other parameters stay plainly insignificant and are not distinguishable from zero (cf. table 14).

Table 14: Sensitivities of CAR to event characteristics of target shares

parameter	**intercept (β_0) (p-value)**	**cash ratio (β_1) (p-value)**	**cross b. (β_2) (p-value)**	**cyclical (β_3) (p-value)**	**financials (β_4) (p-value)**
CAR0/3	0.27394	-0.00857	-0.21087*	-0.08621	-0.18854
	(0.1499)	(0.9505)	(0.0900)	(0.5517)	(0.2441)
CAR0/10	0.29164	-0.02500	-0.24356	-0.11957	-0.20430
	(0.2130)	(0.8847)	(0.1131)	(0.5094)	(0.3079)
CAR-3/3	0.34563*	-0.06496	-0.24040*	-0.10473	-0.24089
	(0.0980)	(0.6641)	(0.0754)	(0.5036)	(0.1733)
CAR-10/10	0.40014	-0.11241	-0.28182	-0.18025	-0.28571
	(0.1341)	(0.5635)	(0.1029)	(0.3785)	(0.2092)

*/**/*** indicate 90% / 95% / 99% confidence intervals

Taking into consideration a seven-day event window around the announcement day (CAR-3/3) leads to an intercept of 34.563 percent and a dummy variable for cross-border transactions of minus 24.040 percent. Both parameters are significant within a 90 percent confidence interval. Finally, table 14 presents the results for a twenty-one-event day event window (CAR-10/10). Therefore, the cross-

border dummy results in a minus of 28.182 percent. However, it is tightly not significant within a decent confidence interval. While the intercept increases to 40.014 percent compared to the CAR-3/3, the p-value accelerates as well and therefore the parameter gets less significant. With a p-value of 0.2092 the paper implies some negative influence of the financial industry dummy. Considering the sensitivity of the cash-ratio reveals that there is a non-significant influence on the CAR for all event-windows.

By applying the adjusted beta in the underlying model, the estimates do not lead to different findings (cf. appendix: p.IX). Excluding the industry dummy variables from equation 15 and running for different CAR event windows results in similar results as table 14 presents (cf. appendix: p.IX). The parameters for cross-border transaction get less significant and thus do not fit into appropriate confidence intervals. However, the rather low p-values do allow for making equal inferences about possible directions of the level shifts as within table 14.

Similar to section 6.4.1.1 the parameters are estimated by using only data for non-financial companies. Therefore, equation 16 presents the included regressors. The economic interpretation is the same as in equation 15. The dummy for other industries is not included since there is no data available concerning this sector as well as the financial industry dummy as the corresponding data is removed from the sample.

Equation 16:
$$(C)\,AR = \beta_0 + \beta_1(cash\,ratio) + \beta_2(dummy\,cb\,target) + \beta_3(dummy\,cyclicals) + \varepsilon$$

The results for specific event days are presented within table 15. On the event day (AR0) the intercept is estimated to be 26.680 percent with a related p-value of 0.1439. The dummy variable concerning the cross-border transactions results in a level change of minus 25.108 percent, which is almost significant within a 95 percent confidence interval. A similar outcome is achieved by using the adjusted beta model for estimating the abnormal returns as well as by not controlling for industries (cf. table 15).

Considering the day after the takeover announcement (AR1) leads to no significant findings regarding the controlled parameters. The high magnitude of the p-values does imply that even no indications can be drawn regarding any anticipated directions. Two days after the publication of the event (AR2) the intercept results in a minus 1.163 percent level and a p-value of 0.1238.

Table 15: Sensitivities of AR to event characteristics of target shares excl. financial industry

parameter	intercept (β_0) (p-value)	cash ratio (β_1) (p-value)	cross b. (β_2) (p-value)	cyclical (β_3) (p-value)
AR0	0.19841	0.07731	-0.21971**	
	(0.1409)	(0.5519)	(0.0473)	
AR0	0.26680	0.04225	-0.25108*	-0.08418
	(0.1439)	(0.7706)	(0.0509)	(0.5382)
AR0 adj. beta	0.27050	0.04031	-0.25344*	-0.08497
	(0.1419)	(0.7825)	(0.0507)	(0.5377)
AR1	0.00489	-0.00382	0.00041	-0.00761
	(0.7761)	(0.7920)	(0.9716)	(0.5773)
AR2	-0.01163	0.00742	0.00508	0.00564
	(0.1238)	(0.2312)	(0.2963)	(0.3239)

*/**/*** indicate 90% / 95% / 99% confidence intervals

Finally, table 16 exhibits the parameter values for different event periods. The four days period starting on the announcement day (CAR0/3) shows a significant dummy variable that takes the effects for cross-border transactions. The parameter indicates a level change of minus 24.655 percent along with a p-value of 0.0692. The beta values get less significant by expanding the event window up to an eleven-day event window (CAR0/10).

Table 16: Sensitivities of CAR to event characteristics of target shares excl. financial industry

parameter	intercept (β_0) (p-value)	cash ratio (β_1) (p-value)	cross b. (β_2) (p-value)	cyclical (β_3) (p-value)
CAR0/3	0.25081	0.05223	-0.24655*	-0.08361
	(0.1939)	(0.7369)	(0.0692)	(0.5679)
CAR0/10	0.26934	0.03361	-0.27796	-0.11706
	(0.2664)	(0.8647)	(0.1009)	(0.5304)
CAR-3/3	0.32536	-0.01170	-0.27166*	-0.10245
	(0.1309)	(0.9451)	(0.0680)	(0.5240)
CAR-10/10	0.37941	-0.05792	-0.31380	-0.17792
	(0.1734)	(0.7950)	(0.1009)	(0.4025)

*/**/*** indicate 90% / 95% / 99% confidence intervals

Considering a seven-day event window around the announcement day (CAR-3/3) uncovers a vaguely insignificant intercept resulting in a parameter of 32.536 percent. However the dummy variable for cross-border transactions is significant within a 90 percent confidence interval and a corresponding level change of minus 27.166 percent. By widening the event-window to a twenty-one day period the

resulting parameter get less significant compared to the shorter event phase (cf. table 16). As within previous results, the parameter measuring the sensitivity of the cash-ratio is not different from zero for all event windows and event days. Estimating the normal returns by using the adjusted beta model does not lead to different findings (cf. appendix: p.X). The same inference holds for results estimated without controlling for the cyclical and non-cyclical industry (cf. appendix: p.X).

6.4.2 Interpretation hypothesis 4 – Cross border transactions bidding company

Considering cross-border transactions from the bidders perspective, hypothesis four expects that they react in a similar way regarding the abnormal return as domestic transactions. Therefore, the dummy variable for cross-border transactions within the different equations should not be different from zero. The results computed within section 6.4.1.1 lead to the conclusion that hypothesis four can be rejected for various event windows and therefore cross-border transactions show essentially a different pattern regarding the abnormal return than domestic takeovers. The findings are somehow dependent on the defined sectors. This issue arises from regressions that control for industries, while therein the cross-border dummy variable is measured against a specific sector. However, the tenor declares that cross-border transactions have a negative impact on the return of the bidding company (cf. section 6.4.1.1). Excluding the data from the financial industry leads to less significant results and some event periods are not distinguishable from zero. However, the negative direction of the parameter persists. The same conclusion is drawn when not controlling for industries and therefore measuring the difference on an average domestic transaction (cf. section 6.4.1.1). Additionally, using the adjusted beta model for estimating the underlying returns does not lead to different inferences on the hypothesis. On several single event days around the announcement significant sensitivities are identified. These imply that adjustments regarding the stock price are done before and after the deal declaration. Therefore, the direction of the adjustment is economically more important and meaningful than the specific day of the outcome.

Hence, the thesis contradicts the findings from Georgen and Renneboog (2002) and Lowinski et al. (2003) for the European and the Swiss market, respectively (cf. section 2.2.1). However, their research was conducted on pre-subprime crisis data. Looking at the results from the perspective that Fatemi and Furtado (1988) propose (cf. chapter 2.2.1), the Swiss financial market might be somehow segmented from the international capital markets. Mokhova (2011) concludes that this could be due to new risk factors triggered by the sub-prime crisis, which are incorporated into the firms' cost of capital including different country specific factors. Moreover, Fatemi and Furtado (1988) also mention that discrepancies occur, when cross-border transactions offer diverse disadvantages compared to national transaction. Consequently, the results from section 6.4.1.1 might imply that the costs of integration for

bidding companies are significantly higher for international transactions and thus leading to lower abnormal returns.

Finally, this hypothesis contributes to the existing empirical literature that it discovers a significant negative difference for cross-border transactions compared to domestic deals for the Swiss M&A market. Therefore, it contradicts previous findings for the global and the Swiss market. Additionally, it emphasizes the differences between the various industries, while especially the financial sector results often in a significant negative level shift. The thesis assumes that this new evidence is based on a changing economical environment caused by the recent sub-prime crisis and its strong influence on the banking sector.

6.4.3 Interpretation hypothesis 5 – Cross border transactions target company

Under hypothesis five, the paper claims that the abnormal return resulting from cross-border and domestic transactions does not differ significantly for short-term event windows concerning target firms. Taking the results of section 6.4.1.2 into consideration, the paper is able to reject the hypothesis for the event day and most event periods investigated. Furthermore, the outcome is robust if the control variables regarding the various industries are neglected. Conducting the analysis without data from financial institutions does lead to the same conclusion, and so does the application of the adjusted beta model. The results imply that Swiss target firms involved in cross-border transactions do receive a significant lower abnormal return than Swiss target firms taken over by a domestic acquirer.
Burksaitiene (2010: 34) mentions that there has been a drop of cross-border transaction since 2008 within developed countries averaging at around 33 percent. A main reason of this decrease is the reduced credit distribution of banks to finance such international transactions (Burksaitiene, 2010: 34). The findings of Burksaitiene (2010) imply that the international corporate takeover market experienced a deteriorating competitive environment. Therefore, the abnormal return occurring to the target firm, involved in a cross-border transaction, declines. Shelton (2000: 368) explains this effect that competition between different bidders moves the abnormal return to the target company. As a consequence, less competition reduces the rent received by the target company.

The significant difference between cross-border and national deals might also be due to further uncertainty perceived by the target company possible future investors. He has higher costs by forecasting a possible outcome of an international deal and consequently is less willing to pay up the price for shares involved in cross-border corporate takeovers.

In conclusion, hypothesis five adds some new evidence for the Swiss market to the existing international empirical studies. Shareholders from Swiss target firms receive a significant higher abnormal return within domestic deals compared to cross-border transactions for the post period of the sixth merger wave.

6.4.4 Interpretation hypothesis 6 – Means of payment

Finally, hypothesis six considers the impact of the means of payment regarding the bidding company by claiming that acquirers receive a higher abnormal return within the Swiss market by decreasing the cash ratio of the total payment. This is explained by the sensitivity of the abnormal returns when the cash share of total payment is increased by one percent point. Taking the results form section 6.4.1.1 into consideration, this claim has to be rejected. The paper does not find any significance regarding the influence of the cash ratio on the abnormal return. Even though the outcomes are far from significant on a decent level, they imply a negative sensitivity of an increasing cash share on the abnormal return. This finding is robust for most event windows and consistent when the financial industry dummy is excluded as well as by applying the adjusted beta model.

Travlos (1987) implies that such non-significant outcomes arise due to offsetting effects. While on the one hand, the signaling effect leads to a decrease of the abnormal return (cf. section 2.2.2), on the other hand the possible positive effect from the takeover announcement makes previous change immaterial (Travlos, 1987: 961). Furthermore, Travols (1987) finds for the US data sample from 1972 to 1981 that the payment method does not have a direct positive influence on the abnormal return. These findings partly support our different results from section 6.4.1.1.

The interpretation from hypothesis six adds a new insight to the existing global empirical research, which says that the means of payment has no impact on the abnormal return of bidding stocks within the Swiss market for the period from 2008 to 2011. This effect has been found on different short-term event windows and may also be a consequence from the recent turmoil on the global capital markets by influencing different investors' risk perception.

6.4.5 Discussion on further findings

This section offers a short discussion on the remaining findings resulting from section 6.4.1.1 and 6.4.1.2. Hence, it should support the reader to get a comprehensive overview on the stock price dynamics within the Swiss corporate takeover market. However, these outcomes are not related to any stated hypotheses and involve only control variables from the different regressions.

By controlling for industries, an obvious result is that **bidding companies** from the cyclical industries receive a significant higher return on the event day than the group of other industries. Considering extended event periods, the financial industry dummy gets significantly negative compared to the omitted variable. This finding regarding the financial sector is robust for all tested event windows exceeding AR0. The results from section 6.4.1.1 regarding the various industry parameters underline their importance as control variables within the different regressions.

The industry dummies are less significant for the **target company**. The negative level shift of the financial industry persists, even though the reliability is not given regarding the associated p-values. Nonetheless, on some event days after the announcement the paper reveals significant influence for the cyclical industry. However, the thesis does not find any sound economical explanation for these positive shifts. This inference is still valid when the financial data is excluded or the adjusted beta model is used for estimating the returns.

The inclusion of further control variables e.g. the deal price to market capitalization ratio, the log market capitalization or the log deal price do not lead to improved findings and significances. Furthermore, one might expect that the nature of bid has a certain influence on the abnormal return. Due to the lack of data regarding unsolicited takeovers, this variable could not be included into the tests. Therefore, the results for these regressions are excluded from the analysis chapter.

7 Discussion

The purpose of this paper is to proof the international evidence on the corporate takeover market for the Swiss M&A environment. Interestingly, some results diverge significantly from the international findings and bring up some new insights on various specifics of the Swiss market. In current chapter, the paper aims to combine these findings that are concluded under each hypotheses for gaining a sound and linked overview for the Swiss M&A market. The reader should keep in mind that the results are only valid for the investigated period and therefore influenced from the recent financial turmoil on the capital markets. Additionally, different caveats are discussed that have to be taken into account regarding the analysis part. Finally, the paper is concluded with the lessons learned and some recommendations for further research.

7.1 Conclusion

The paper finds significant abnormal returns for **Swiss target firms** over all event windows. The highest and the most reliable return results on the announcement day. However, by expanding the event window the cumulative abnormal return declines as well as the related t-value. Even though there is no high significance on the specific event days around the event, the CAR1/10 indicates a reversion of the stock price after the announcement day. Therefore, the assumption of efficient markets does not hold completely. Finally, the results obtained by the adjusted beta model specification do not differ from the results estimated by the base model.

Using the results from the OLS-analysis sheds light on some further specifics of Swiss target firms' reaction. The thesis finds a significant difference between the abnormal returns of Swiss target companies involved in cross-border transactions compared to domestic deals. The results imply persistently that cross-border deals generate a significant lower abnormal return for shareholders of the target firm. This might be due to the decreasing competition in the international M&A environment and high information cost occurring to investors (cf. section 2.2.1). However, the influence of cross-border deals is not uniformly pronounced through the various industries.

Different empirical studies mention the influence of the means of payment on the abnormal return. They emphasize the positive influence of an increasing cash share (cf. section 2.2.2). However, the empirical analysis on the Swiss data does not find any significant relation between the payment form and the abnormal return. Though not reliable, the parameters indicate a negative direction on the abnormal return by an increasing cash allocation for most event windows and hence contradict the diverse international empirical findings. By excluding the financial sector from the data, the algebraic signs change for some event windows and predict the same influence as found by diverse previous

studies and proposed by theory. Nevertheless, all parameters concerning the means of payment stay insignificant. The outcome persists by applying the adjusted beta model for return estimations. This implies that the form of payment is not relevant and other characteristics received a stronger emphasis from investors during the recent period.

The paper rejects the claim that shares from **Swiss bidding companies** do experience a positive abnormal return over the investigated short-term period. The results are robust against model specifications, i.e. adjusted beta and controlling for outliers. By making an intertemporal comparison to an earlier study on the Swiss M&A market, the outcome implies an increased volatility on the abnormal returns over the last decade. This fact may be related to the financial turmoil on the capital markets during the most recent years.

The outcome of the OLS-regression identifies an interesting effect. Swiss bidding companies involved in a cross-border transaction do face a significant lower return than Swiss bidding firms engaged in a domestic deal. This implies that bidders, which acquire a domestic company, do receive an abnormal return over the short-term event period, while internationally focused transaction create only a normal return or even a negative abnormal return. This demonstrates a certain home bias of Swiss investors during the recent period.

Considering the means of payment the paper expects to find a negative relationship between the abnormal return and the share of cash within the means of payment. While the negative influence is found on most event windows, all outcomes are not significant within a reliable confidence interval and therefore not different from a zero influence. A reasonable rationale that explains these reactions is the so-called offsetting effect that consists of a negative signaling reaction and a positive announcement dynamic. Additionally, the unstable market conditions during previous years might have influenced the attitude of the investors regarding the form of payment.

The overall abnormal return is significantly higher for the target firms' than for the bidding firms' shareholders. Therefore, it provides evidence that the rents from M&A transactions are distributed towards target companies, while investors of Swiss bidding firms merely receive the normal return. The main difference is accumulated on the event day. However, on days prior and after the announcement no economically sound divergences consist between the abnormal returns. One implication from the evidence about the Swiss market is that by considering the attenuation bias, the average Swiss bidding firm is noticeably bigger than the average Swiss target firm and therefore helps to explain this specific outcome.

Finally, the findings of instant thesis are not thoroughly in line with the existing literature and uncover some particular behavior on the Swiss corporate takeover market for the period since 2008. However, all the dynamics and sensitivities can be explained by an economic interpretation and add some new insights of the Swiss M&A market to the existing empirical literature.

7.2 Caveats

This section contains the limitations that have to be considered within the various econometrical tests. Some of the points may decrease the explanatory power of the findings. Each part tries to describe how the thesis circumvents these deteriorations. It is likely that the paper has to cope with further limitations, however chapter seven focuses on those that seem most relevant.

7.2.1 Sample size of underlying data

As expressed by chapter five, the thesis uses 52 events in total, which stem from an initial population of 1166 events. The reduction of the events down to the final sample set is due to the mandatory selection criteria described in chapter five. Therefore, the sample size is rather small, which is a common problem that often impairs event studies. McWilliams and Siegel (1997: 631ff) indicate that there is numerous empirical research conducted with even a smaller data sample than applied within this thesis and hence, gives eligibility to the conducted analysis. Deaton (2000: 130) explains, by using a consistent estimation procedure, increasing the sample size brings the estimates closer to the true population parameter and supplementary, they are less dispersed around it. To account for the small sample size used within this paper, the t-test is applied due to its advantageous properties as proposed by Barrow (2009: 187).

McWilliams and Siegel (1997:635) mention that accounting for outliers is particularly important within small sample sets. Therefore, the thesis runs the abnormal returns against time to observe possible outliers (cf. appendix: p.VII). The regressions have been performed with data sets that include and exclude these outliers. Another remark has to be stated regarding the control variables. This paper focuses mainly on controlling for industries and selectively on different size variables (cf. section 6.4.5). Adding additional control variables to the regression would consume further degrees of freedom and hence reduce the overall explanatory power. In general, the explanatory power of the thesis allows showing different directions of the dynamics within the corporate takeover market rather than finding reliable absolute changes.

7.2.2 Use of daily data and non-parametric tests

Brown and Warner (1985: 4) point out that using daily stock returns for event studies may produce various problems. For instance, daily returns depart from the normality assumption compared to monthly data (Brown and Warner, 1985: 4). Supplementary, Fama (1976) states that the evidence suggests that distributions of daily returns normally contain excess kurtosis. Same holds for the daily excess returns. However, the central limit theorem says if these returns are identically and independently distributed, drawings from cross-sectional samples result in distributions that converge to normality by augmenting the data size (Brown and Warner, 1985: 4). Dyckman, Philbrick and Stephan (1984) indicate that non-normality of daily-return residuals have little effect on inferences drawn from t-tests.

In their study about appropriate testing methodologies Berry, Gallinger and Henderson (1990) found that parametric tests do work well in combination with daily returns, while non-parametric tests do not do a sufficient job, since they are an unnecessary complication. Finally, Brown and Warner (1985) provide evidence that applying the OLS market model and using standard parametric tests is appropriate.[19] Therefore, this study relies on the regular OLS-regression in combination with the market model and standard t-tests for drawing inferences from the analysis.

7.2.3 Benchmark of market model

As described in chapter five the market model is used to estimate the expected returns and consequently the abnormal returns. Within this model the market is represented by the SPI (cf. section 5.5). This index is known as Switzerland's overall market indicator, because it includes all equities traded on the Swiss exchange and domiciled in Switzerland (SIX, 2012). Due to the weighting with regard to the market capitalization, the index gives strong emphasis on a few big companies within the Swiss market. However, the SPI represents the most appropriate benchmark that is available for the Swiss equity market and therefore is used within instantaneous thesis.

7.2.4 Homoscedasticity and robust standard errors

The assumption of homoscedasticity says that the variance of the sample errors is constant over time (Brooks, 2008: 132). Thus, to detect heteroscedasticity graphically, the AR0 and CAR-10/10 are run over time (cf. appendix: p.VII). The graphs do not indicate signs of heteroscedasticity meaning that the variance over time seems to be constant. Therefore, the thesis forgoes to use robust standard errors.

[19] For a more elaborate and comprehensive discussion on the use of daily returns and non-parametric tests consult Brown and Warner (1985) and Dyckman, Philbrick and Stephan (1984).

7.2.5 Clustering and cross-correlation of events

Henderson (1990: 294) emphasizes that clustering is a serious general problem within the conduction of event studies. He defines event clustering as the case when different events occur in a higher frequency at some point or short period in time. This circumstance might be given within the data set of this paper. Out of event clustering the problem of cross-correlation might arise. However, Chandra, Moriarity and Willinger (1990: 406) state that cross-correlation is of little issue if the events are collected randomly and when the applied event period is relatively small compared to the estimation period (Binder, 1998: 116). Both prerequisites are given within this thesis and therefore, the effects arising from event clustering are neglected.

7.3 Lessons learned

Present section summarizes the lessons learned during the iterative development process of this thesis. These lessons are of general nature, including matters about the structure, and also of particular kind regarding specific econometrical issues.

First, I realized how important it is to set sensible borders regarding the field of investigation and the considered time period. This issue influences the explanatory power of the thesis significantly, since a too broad field of investigation does not allow dealing with specific issues within the predetermined page count. Furthermore, there is a trade-off between statistical appropriateness and actuality of the analysis. While extending the time period increases the data sample, the inferences from the event study would catch influences from different merger waves and therefore not mirror the actual market situation.

Second, the paper made me aware that a proper data selection and filtration, i.e. regarding confounding effects, is indispensable. It ensures that the explanatory power of the thesis is as high and as significant as possible. Even though, I found it hard to accept cutting down the sample size as proposed by the selection criteria, it is absolutely crucial to adhere the correctness of the paper.

Additionally, the econometrical issues arising in an event study using daily data are numerous. While it appeared challenging and complex to conduct inferences from panel and cross sectional data, it also allowed me to gain different insights and build up diverse knowledge in addition to my existing know-how from econometrical courses.

7.4 Further research

In the opinion of the author the thesis contains the most important aspects of the Swiss takeover market to infer meaningful facets from the analysis. However, there are some issues that could offer additional insight into the field and enhance the conducted analysis regarding its inferences.

First, by using time series data of stock prices, the thesis excludes non-quoted companies from the investigation. To avoid this restraint, accounting data could substitute the stock price returns. This increases the data population tremendously, since most of the Swiss firms are not listed on stock exchanges, and adds further evidence on privately held companies. However, access to such data is not as simply as for stock prices and often only available on quarterly basis.

Another approach is to open up the geographic area. More specifically, comparing events from different regions with the Swiss evidence. This would allow drawing inferences of country specific discrepancies during the post period of the sixth merger wave. It might be interesting to compare the dynamics of the Swiss market to others, which where hit more or even less severe by the subprime crisis.

Finally, an intertemporal assessment may help to understand the variation over time of the stock price dynamics around merger events. Therefore, the results from this thesis, representing the post period of the sixth merger wave, could be compared to the outcomes computed for the prior wave or an earlier post wave period.

There are several areas to do further research within this field, which would add additional evidence to the results of this paper. Thus, the thesis states a starting point by concluding the general findings for the Swiss corporate takeover market during the period from 2008 to 2011.

8 Literature

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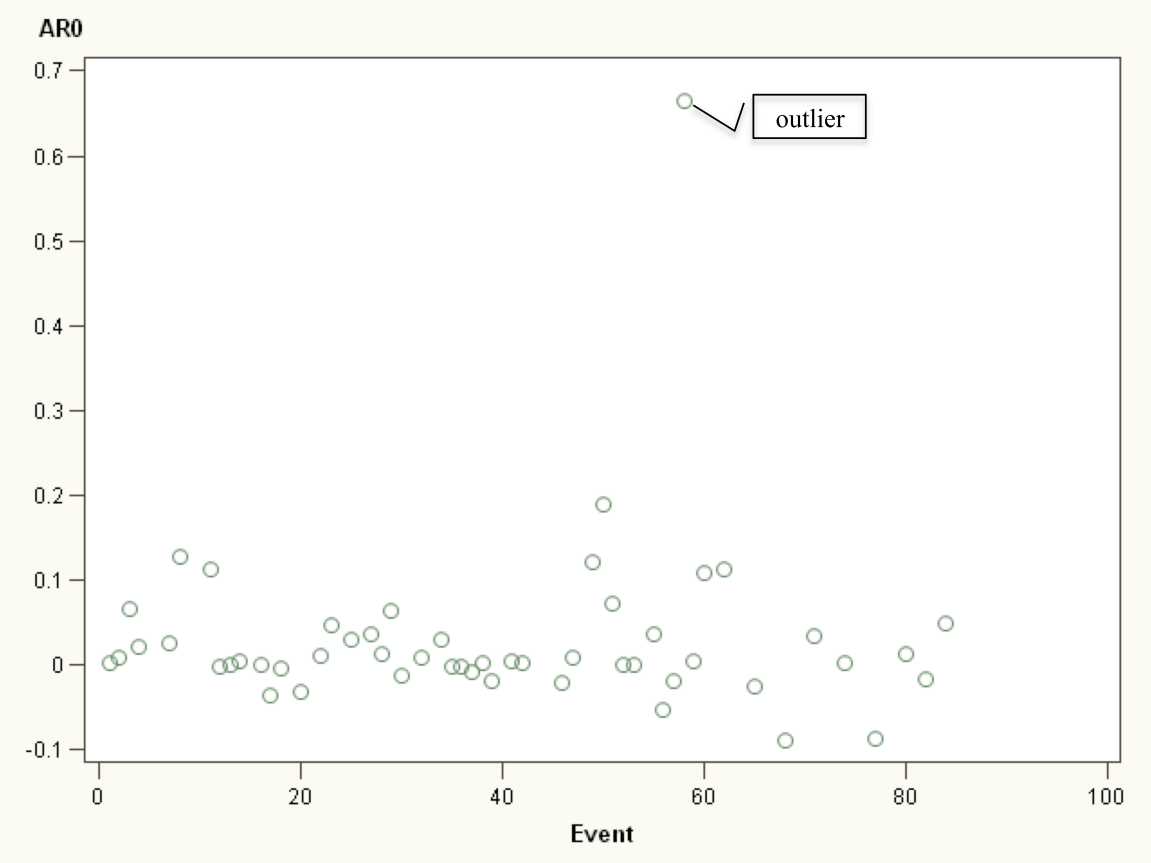
Appendix

Event	Date	Company	Bidder/Target	Log Deal size	Log Market C	Industry cluster	Cross-Border	Means of Payment-% Cash	Total % Stake	Nature of bid	Ratio Deal Size / Market Cap	Outlier AR (	Oulier other	Adjustment to KPMG Data
1	24.01.2011	Novartis	Bidder	6.152733	11.92946	non-cyclical	Yes	100	100	Friendly	0.003098855	1	1	Specific date, not exactly specified in KPMG Report
2	07.04.2011	Novartis	Target	6.016157	11.89838	non-cyclical	Yes	100	<75	Friendly	0.002788567	1	1	Specific date, not exactly specified in KPMG Report
3	18.04.2011	Synthes	Target	9.966462	9.87184	non-cyclical	Yes	35	100	Friendly	1.09924534	1	1	Specific date, not exactly specified in KPMG Report
4	21.06.2011	Valora	Bidder	5.298317	6.77141	non-cyclical	Yes	100	100	Friendly	0.229215853	1	1	Specific date, not exactly specified in KPMG Report
7	11.07.2011	Lonza	Bidder	7.294377	8.36020	non-cyclical	Yes	100	100	Friendly	0.344443508	1	1	Specific date, not exactly specified in KPMG Report
8	22.12.2011	Forbo	Target	5.978886	7.12434	non-cyclical	Yes	100	100	nd	0.318078964	1	1	Specific date, not exactly specified in KPMG Report
11	11.04.2011	Schulthess	Target	6.154858	6.53976	cyclical	Yes	60	100	Friendly	0.680517829	1	1	Specific date, not exactly specified in KPMG Report
12	11.04.2011	Meyer Burger Tech	Bidder	5.973810	7.61928	cyclical	Yes	100	100	Friendly	0.19292131	1	1	Specific date, not exactly specified in KPMG Report
13	24.05.2011	Nestle	Bidder	5.298317	12.27941	non-cyclical	Yes	-	100	Friendly	0.000929285	1	1	Specific date, not exactly specified in KPMG Report
14	11.07.2011	Nestle	Bidder	7.437206	12.28632	non-cyclical	Yes	100	<75	Friendly	0.007835284	1	1	Specific date, not exactly specified in KPMG Report
16	07.03.2011	Kuoni	Bidder	6.558198	7.35371	cyclical	Yes	100	100	nd	0.451350209	1	1	Specific date, not exactly specified in KPMG Report
17	02.06.2009	SPS	Bidder	7.436028	8.29348	other	No	0	100	Friendly	0.424242879	1	1	not in KPMG Database
18	26.07.2011	Adecco	Bidder	5.365976	9.37379	other	Yes	-	100	Friendly	0.01817311	1	1	Specific date, not exactly specified in KPMG Report
20	04.01.2010	Novartis	Bidder	10.250617	11.85843	non-cyclical	Yes	0	76.85	Friendly	0.200324909	1	1	Specific date, not exactly specified in KPMG Report
22	24.09.2010	Novartis	Target	5.991465	11.93061	non-cyclical	Yes	100	100	nd	0.002634289	1	1	Specific date, not exactly specified in KPMG Report
23	15.12.2010	Novartis	Bidder	9.464983	11.94667	non-cyclical	Yes	5	100	unsolicited	0.083601853	1	1	Specific date, not exactly specified in KPMG Report
25	22.09.2010	Helvetia	Bidder	5.669881	7.99288	financial	No	100	100	nd	0.097979262	1	1	Specific date, not exactly specified in KPMG Report
27	02.06.2010	Sulzer	Bidder	5.337538	7.98143	cyclical	Yes	100	100	Friendly	0.071083893	1	1	Specific date, not exactly specified in KPMG Report
28	30.11.2010	ABB	Bidder	8.340217	10.72449	cyclical	Yes	100	100	Friendly	0.092155801	1	1	Specific date, not exactly specified in KPMG Report
29	06.12.2010	Winterthur Techn	Target	5.916202	6.06097	cyclical	No	100	100	Friendly	0.865225402	1	1	Specific date, not exactly specified in KPMG Report
30	13.12.2010	SGS	Bidder	5.484797	9.49428	cyclical	Yes	100	100	nd	0.018142699	1	1	Specific date, not exactly specified in KPMG Report
32	01.04.2010	Richemont	Bidder	5.883322	9.93998	non-cyclical	Yes	100	100	Friendly	0.017306751	1	1	Date, wrong month indicated (March instead of April)
34	12.08.2010	Aryzta	Bidder	6.122493	8.11099	non-cyclical	Yes	100	<75	nd	0.136901581	1	1	Specific date, not exactly specified in KPMG Report
35	05.05.2010	ABB	Bidder	7.006695	10.66183	cyclical	Yes	100	100	nd	0.025858113	1	1	Specific date, not exactly specified in KPMG Report
36	08.09.2010	Swisscom	Bidder	5.826000	9.92408	cyclical	Yes	100	100	Friendly	0.016604469	1	1	Specific date, not exactly specified in KPMG Report
37	08.04.2010	Petroplus	Bidder	5.393628	7.41542	other	Yes	100	100	nd	0.132418442	1	1	Date, wrong month indicated (June instead of April)
38	12.07.2010	Alpiq	Bidder	5.579730	9.19970	other	Yes	100	100	nd	0.026783476	1	1	Specific date, not exactly specified in KPMG Report
39	24.08.2010	Xstrata	Bidder	6.037871	10.71318	other	Yes	100	100	Friendly	0.009322653	1	1	Specific date, not exactly specified in KPMG Report
41	20.05.2009	Novartis	Bidder	7.150701	11.58198	non-cyclical	Yes	100	100	nd	0.011899284	1	1	Stake
42	31.08.2009	Lonza	Target	5.669881	8.51008	non-cyclical	Yes	100	<75	nd	0.058413921	1	1	Stake
46	08.07.2009	Vontobel	Bidder	6.363028	7.42620	financial	No	100	100	Friendly	0.345359382	1	1	Wrong Announcement date
47	08.07.2009	VT Finance	Target	6.363028	6.12477	financial	No	100	100	Friendly	1.269035533	1	1	Announcement date
49	22.09.2009	Schweiter Tech	Bidder	5.855072	6.55598	cyclical	No	100	100	nd	0.496133288	1	1	Stake
50	09.12.2009	3S Industries	Target	5.690359	5.76120	cyclical	No	0	100	Friendly	0.931608598	1	1	Stake
51	09.12.2009	Meyer Burger Tech	Bidder	5.690359	6.71831	cyclical	No	0	100	Friendly	0.357738512	1	1	Stake
52	19.11.2009	Nestle	Bidder	5.337538	12.05195	non-cyclical	Yes	-	100	nd	0.001213298	1	1	Stake
53	10.11.2009	Logitech	Bidder	6.003887	8.14647	cyclical	Yes	100	100	Friendly	0.117351847	1	1	Stake
55	15.06.2009	Holcim	Bidder	7.381502	9.66013	other	Yes	100	100	nd	0.102424972	1	1	Stake
56	20.10.2009	Adecco	Bidder	7.057037	9.17633	other	Yes	100	100	Friendly	0.120116951	1	1	Stake
57	07.04.2008	Novartis	Bidder	9.268515	11.80210	non-cyclical	No	100	<75	nd	0.079374292	1	1	Stake
58	10.07.2008	Speedel	Target	6.809039	6.89437	non-cyclical	No	100	100	Friendly	0.918212223	0	0	Stake
59	10.07.2008	Novartis	Bidder	6.809039	11.93774	non-cyclical	No	100	100	Friendly	0.005924225	1	1	Stake
60	26.08.2008	Sia Abrasives Hld	Target	5.361292	5.59635	non-cyclical	No	100	100	Friendly	0.790528504	1	1	Stake
62	02.10.2008	Sia Abrasives Hld	Target	5.874931	5.65182	non-cyclical	Yes	100	100	Friendly	1.249956111	1	1	Stake
65	24.04.2008	Zurich FS	Bidder	5.886104	10.67284	financial	Yes	100	<75	nd	0.008339656	1	1	Stake
68	14.08.2008	Swiss Life	Bidder	6.120297	8.99164	financial	Yes	100	100	Friendly	0.056622605	1	0	Stake
71	31.12.2008	Credit Suisse	Target	5.886104	10.32112	financial	Yes	0	100	nd	0.011854869	1	1	Stake
74	21.02.2008	Hiestand	Target	5.517453	7.01908	non-cyclical	Yes	100	<75	Friendly	0.222766962	1	0	Stake
77	09.06.2008	Hiestand	Target	6.791221	6.85495	non-cyclical	Yes	15	100	Friendly	0.938264316	1	1	Stake
80	18.02.2008	Holcim	Bidder	5.645447	10.15203	other	Yes	-	<75	nd	0.011036081	1	1	Stake
82	28.07.2008	Forbo	Bidder	5.501258	7.11830	non-cyclical	Yes	100	100	nd	0.198485033	1	1	Stake
84	19.12.2008	Alpiq	Bidder	8.021256	9.68167	other	No	0	100	Friendly	0.190059839	1	1	Deal Value, Stake


AR0
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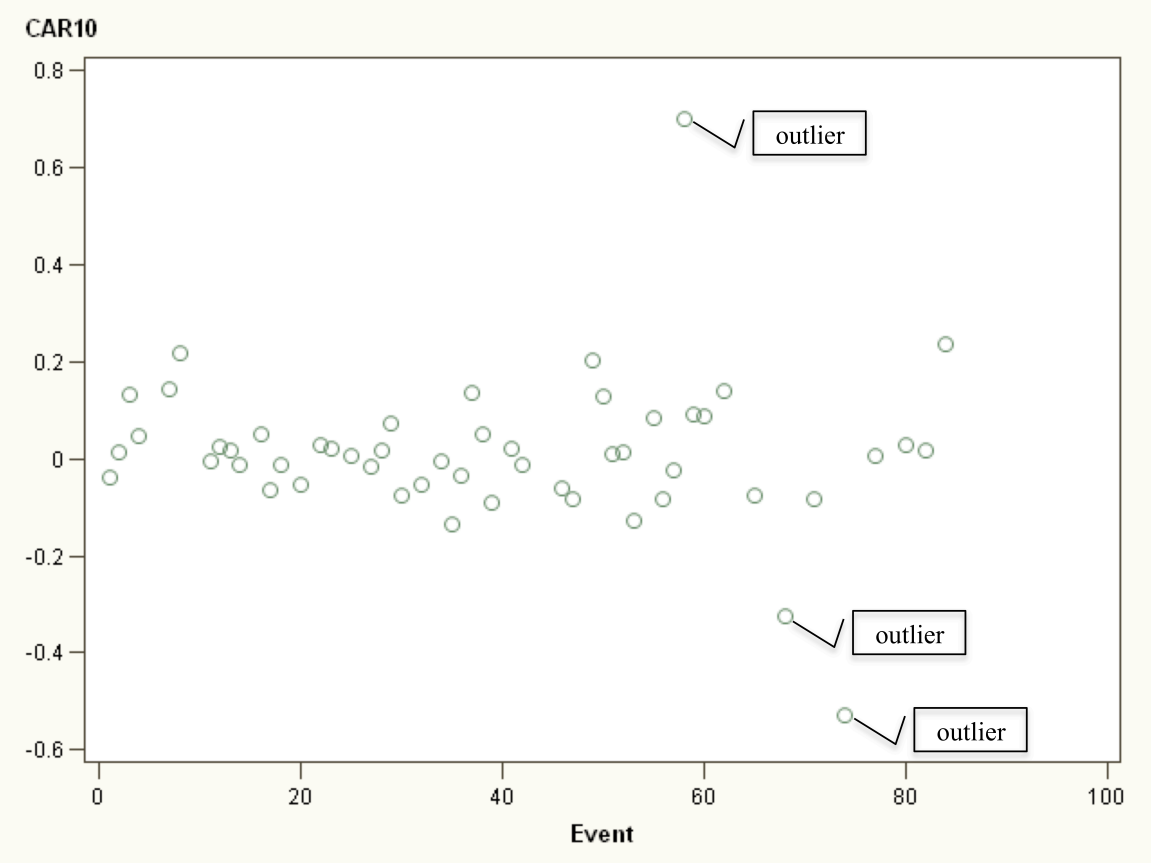
CAR10
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-0.6
outlier
outlier
outlier
0
20
40
60
80
100
Event

Corresponds to table 10 within section 6.4.1.1

Sensitivities of CAR to event characteristics of bidding shares

parameter	intercept (β_0) (p-value)	cash ratio (β_1) (p-value)	cross b. (β_2) (p-value)	cyclical (β_3) (p-value)	non-cycl. (β_4) (p-value)	financials (β_5) (p-value)
CAR0/3 adj. beta	0.05413*	-0.01185	-0.04311	0.01635	-0.00984	-0.05519
	(0.0913)	(0.7062)	(0.1061)	(0.5675)	(0.7190)	(0.1510)
CAR0/10 adj. beta	0.06166	0.00171	-0.06986*	0.00335	0.00038	-0.11631**
	(0.1901)	(0.9708)	(0.0789)	(0.9369)	(0.9925)	(0.0453)
CAR-3/3 adj. beta	0.09134**	-0.01574	-0.06924**	0.00070	-0.02048	-0.09792**
	(0.0248)	(0.6870)	(0.0397)	(0.9843)	(0.5475)	(0.0443)
CAR-10/10 adj. beta	0.08319	0.03415	-0.10334**	-0.03746	-0.01455	-0.17834***
	(0.1022)	(0.4958)	(0.0179)	(0.4117)	(0.7378)	(0.0057)

*/**/*** indicate 90% / 95% / 99% confidence interval

Corresponds to table 11 within section 6.4.1.1

Sensitivities of AR to event characteristics of bidding shares excl. financial industry

parameter	intercept (β_0) (p-value)	cash ratio (β_1) (p-value)	cross b. (β_2) (p-value)	cyclical (β_3) (p-value)	non-cycl. (β_4) (p-value)
AR1	-0.00601	0.00333	0.01131	-0.00115	-0.00754
	(0.5317)	(0.7321)	(0.2101)	(0.8945)	(0.3666)
AR-1	0.00919	-0.00286	-0.00497	0.00293	-0.00296
	(0.1488)	(0.6520)	(0.3923)	(0.6033)	(0.5837)
AR1	-0.00890	0.00333	0.01053		
	(0.2920)	(0.7238)	(0.2321)		
AR-1	0.00883	-0.00215	-0.00552		
	(0.1158)	(0.7277)	(0.3361)		

*/**/*** indicate 90% / 95% / 99% confidence interval

Corresponds to table 12 within section 6.4.1.1

Sensitivities of CAR to event characteristics of bidding shares excl. financial industry

parameter	intercept (β_0) (p-value)	cash ratio (β_1) (p-value)	cross b. (β_2) (p-value)	cyclical (β_3) (p-value)	non-cycl. (β_4) (p-value)
CAR0/3 adj. beta	0.04823	-0.01966	-0.02703	0.01643	-0.01079
	(0.1245)	(0.5286)	(0.3453)	(0.5538)	(0.6842)
CAR0/10 adj. beta	0.05176	-0.01141	-0.04290	0.00348	-0.00198
	(0.2295)	(0.7912)	(0.2811)	(0.9277)	(0.9570)
CAR-3/3 adj. beta	0.08551**	-0.02347	-0.05335	0.00077	-0.02142
	(0.0369)	(0.5558)	(0.1499)	(0.9826)	(0.5283)
CAR-10/10 adj. beta	0.07623	0.02493	-0.08438*	-0.03737	-0.1567
	(0.1222)	(0.6105)	(0.0677)	(0.3928)	(0.7066)

*/**/*** indicate 90% / 95% / 99% confidence interval

Corresponds to table 12 within section 6.4.1.1

Sensitivities of CAR to event characteristics of bidding shares excl. financial industry

parameter	intercept (β_0) (p-value)	cash ratio (β_1) (p-value)	cross b. (β_2) (p-value)	cyclical (β_3) (p-value)	non-cycl. (β_4) (p-value)
CAR0/3	0.04802*	-0.01672	-0.02822		
	(0.0814)	(0.5796)	(0.3148)		
CAR0/10	0.05359	-0.01042	-0.04541		
	(0.1481)	(0.7989)	(0.2352)		
CAR-3/3	0.07837**	-0.02230	-0.05590		
	(0.0276)	(0.5603)	(0.1213)		
CAR-10/10	0.06627	0.02050	-0.08961*		
	(0.1317)	(0.6723)	(0.0532)		

*/**/*** indicate 90% / 95% / 99% confidence interval

Corresponds to table 14 within section 6.4.1.2

Sensitivities of CAR to event characteristics of target shares

parameter	intercept (β_0) (p-value)	cash ratio (β_1) (p-value)	cross b. (β_2) (p-value)	cyclical (β_3) (p-value)	financials (β_4) (p-value)
CAR0/3 adj. beta	0.28192	-0.01510	-0.21206*	-0.09103	-0.18372
	(0.1526)	(0.9160)	(0.0987)	(0.5445)	(0.2717)
CAR0/10 adj. beta	0.29449	-0.02807	-0.23877	-0.12286	-0.21533
	(0.2168)	(0.8730)	(0.1257)	(0.5059)	(0.2925)
CAR-3/3 adj. beta	0.35793*	-0.07766	-0.23997*	-0.11261	-0.23188
	(0.0988)	(0.6177)	(0.0856)	(0.4889)	(0.2039)
CAR-10/10 adj. beta	0.41642	-0.12139	-0.28641	-0.18691	-0.29961
	(0.1284)	(0.5426)	(0.1050)	(0.3725)	(0.1991)

*/**/*** indicate 90% / 95% / 99% confidence interval

Corresponds to table 14 within section 6.4.1.2

Sensitivities of CAR to event characteristics of target shares

parameter	intercept (β_0) (p-value)	cash ratio (β_1) (p-value)	cross b. (β_2) (p-value)	cyclical (β_3) (p-value)	financials (β_4) (p-value)
CAR0/3	0.14615	0.06093	-0.15990		
	(0.2496)	(0.6076)	(0.1210)		
CAR0/10	0.13614	0.05852	-0.17975		
	(0.3781)	(0.6681)	(0.1535)		
CAR-3/3	0.18588	0.02215	-0.17705		
	(0.1897)	(0.8654)	(0.1208)		
CAR-10/10	0.17418	0.00848	-0.18829		
	(0.3312)	(0.9598)	(0.1927)		

*/**/*** indicate 90% / 95% / 99% confidence interval

Corresponds to table 16 within section 6.4.1.2

Sensitivities of CAR to event characteristics of target shares excl. financial industry

parameter	intercept (β_0) (p-value)	cash ratio (β_1) (p-value)	cross b. (β_2) (p-value)	cyclical (β_3) (p-value)
CAR0/3 adj. beta	0.25722 (0.1972)	0.04979 (0.7566)	-0.25015* (0.0737)	-0.08825 (0.5599)
CAR0/10 adj. beta	0.27104 (0.2711)	0.03356 (0.8672)	-0.27494 (0.1093)	-0.12023 (0.5265)
CAR-3/3 adj. beta	0.33570 (0.1319)	-0.01925 (0.9128)	-0.27425* (0.0738)	-0.11012 (0.5084)
CAR-10/10 adj. beta	0.39259 (0.1673)	-0.05876 (0.7958)	-0.32317* (0.0977)	-0.18423 (0.3950)

*/**/*** indicate 90% / 95% / 99% confidence interval

Corresponds to table 16 within section 6.4.1.2

Sensitivities of CAR to event characteristics of target shares excl. financial industry

parameter	intercept (β_0) (p-value)	cash ratio (β_1) (p-value)	cross b. (β_2) (p-value)	cyclical (β_3) (p-value)
CAR0/3	0.18289 (0.1978)	0.08706 (0.5312)	-0.21539* (0.0648)	
CAR0/10	0.17424 (0.3278)	0.08237 (0.6412)	-0.23433 (0.1077)	
CAR-3/3	0.24213 (0.1282)	0.03098 (0.8382)	-0.23348* (0.0684)	
CAR-10/10	0.23486 (0.2553)	0.01619 (0.9361)	-0.24749 (0.1356)	

*/**/*** indicate 90% / 95% / 99% confidence interval