

**Erasmus University Rotterdam**  
ERASMUS SCHOOL OF ECONOMICS



MASTER THESIS

# **EVA as a performance measure of M&A**

A performance evaluation and comparison study

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# Abstract

This thesis examines the impact of major strategic transactions on acquiring company's post-event performance. The Economic Value Added (EVA®) measure was utilised to proxy for the long-term post-event performance. A basic change model, comparing pre- and post-event performance and a value-based excess EVA improvement methodology were applied. The results show a significant underperformance of acquiring companies' in the post-event period. These results hold true also after controlling for industry effects. There has been found no statistically significant evidence on the impact of the method of payment, business relatedness (between the acquirer and target) or the amount of premium paid for the target, on the acquirers' post-event performance. Further, no univariate conclusion could be drawn on the impact of the acquirer's pre-event Book-to-Market ratio nor on the relative size between the acquirer and target. However, there has been found strong evidence on the acquire's size being negatively related to its post-event performance. The last part of the empirical analysis tried to compare various performance measures between each other. The findings partly support the hypothesis that the initial market's reaction to the event is weakly correlated to the acquirer's long-term operating performance (measured by the EVA). However, no relation was found between the EVA measures and long-term market performance.

## **Keywords**

Mergers & Acquisitions, Economic Value Added, Transactions, Post-event performance

## **JEL Classification**

G30, G34

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# Table of Contents

<b>Abstract</b>	<b>i</b>
<b>Acknowledgements &amp; Declarations</b>	<b>ii</b>
<b>List of Tables</b>	<b>iv</b>
<b>1 Introduction</b>	<b>1</b>
<b>2 Literature Review</b>	<b>3</b>
2.1 M&A performance . . . . .	3
2.1.1 Studies on Market related Measures of M&A performance . . . . .	5
2.1.2 Studies on Accounting based Measures of M&A performance . . . . .	9
2.1.3 Combined approach studies . . . . .	11
2.2 Bid characteristics determining performance . . . . .	12
<b>3 Hypotheses</b>	<b>17</b>
<b>4 Methodology</b>	<b>21</b>
4.1 Economic Value Added . . . . .	21
4.2 Performance measurement through EVA . . . . .	24
4.2.1 Past performance benchmark . . . . .	24
4.2.2 Required improvement in EVA benchmark . . . . .	25
4.3 Attribution analysis . . . . .	30
4.4 Market related measures of performance . . . . .	30
<b>5 Data</b>	<b>33</b>
5.1 Sample rationale . . . . .	33
5.2 Data collection and sampling process . . . . .	34
5.3 Sample characteristics . . . . .	36
<b>6 Results</b>	<b>37</b>
6.1 Change Model . . . . .	37
6.2 EVA Improvement Benchmark . . . . .	47
6.3 Attribution analysis . . . . .	50
6.4 Dependency analysis . . . . .	54
<b>7 Conclusion</b>	<b>59</b>
<b>Bibliography</b>	<b>63</b>

# List of Tables

Table 5.1	M&A sample - Sampling procedures . . . . .	35
Table 5.2	Descriptive Statistics . . . . .	36
Table 6.1	Change Model I: Non-adjusted and Industry-adjusted EVA . . . . .	39
Table 6.2	Change Model II: Method of payment . . . . .	42
Table 6.3	Change model III: Business relatedness . . . . .	44
Table 6.4	Change Model IV: Premium paid . . . . .	46
Table 6.5	EVA Improvement . . . . .	48
Table 6.6	Deal-Characteristics . . . . .	49
Table 6.7	Regression . . . . .	52
Table 6.8	Performance Measures - Characteristics . . . . .	55
Table 6.9	Spearman Correlation Matrix . . . . .	57
Table 7.1	Hypotheses and Conclusions . . . . .	61

# 1 — Introduction

Since the end of the 19th century M&As have become a phenomenon in the business world, largely because of their ability to provide synergies, competitive advantages or restructuring possibilities for firms. The M&A activity has been especially pronounced in North America, but later also in Europe and Asia. With the increasing amount of such events, the need for academic research regarding the actual impact on the transaction's parties grew substantially. As M&As are very complex corporate events, affecting the company on many levels, research has been covered by various fields of study, from finance to organisational management.

Tuch and O'Sullivan (2007) describe a well performing M&A event as one providing an increase in wealth for the shareholders, through synergistic effects and operating performance improvements. However, evaluating the performance of such complex events requires several methodological assumptions and choices to be made. Especially the measure utilised to proxy for the post-event performance or the choice of entity to be studied (Acquirers, Targets, Combined entities). Knowing that M&As occur in waves and are more pronounced in certain industries during these waves (Mitchell and Mulherin, 1996), measuring the performance of such event's becomes even more complicated. Mainly because success factors of such events seem to differ through time and industry. Various summarising studies (Andrade et al., 2001; Tuch and O'Sullivan, 2007; Zollo and Meier, 2008; Ismail et al., 2011; Das and Kapil, 2012; Thanos and Papadakis, 2012) tried to identify the different methodologies and outcomes, researchers have conducted throughout time. Even though their approaches to selecting and evaluating literature and concluding outcomes differ, one thing they generally agree on, is the fragmentation of the research approaches and the heterogeneity in the results.

King et al. (2004) also argue that research has so far tried to always come up with new performance measures and explanatory variables, rather than building upon the already made advances. Thereby, research models tend to be underspecified, because already examined explanatory factors are usually being omitted. They advice future research to build upon and extend already existing models and further examine the result and conclusions. As many scholars stress out in their studies, research should not only focus on one measure of performance when assessing M&A deals, but rather investigate a combination of several such methods in

order to widen the knowledge of the patterns observed. Thanos and Papadakis (2012) and Zollo and Meier (2008) conclude specifically on this issue by suggesting future research to utilise a combination of different performance measures in order to explain more of the post-event performance puzzle.

This thesis should provide a unique view on the topic by applying a specific sample of major strategic transactions in the combination with a yet under-explored measure of M&A performance, the Economic Value Added. Moreover, the methodology applied in assessing the performance comprises of a more traditional outcome-study approach and an alternative required improvement benchmarking approach, to compare and verify the outcomes. Following the presented suggestions by Thanos and Papadakis (2012) and Zollo and Meier (2008), the results obtained by the operating performance measures are further compared with various market related performance measures. By doing so, a more complex view on the post-event performance puzzle of the examined set of major strategic transactions is sought to be provided.

The subsequent parts of this thesis are structured as follows. The literature review in chapter 2 discusses the empirical findings and conclusions made by scholars on the various approaches utilised to measure M&A performance. Further, findings on the major factors and characteristics influencing the transaction's performance are presented. Chapter 3 provides the hypotheses further to be tested in the empirical part of this thesis. In chapter 4, the variables employed to proxy for M&A performance as well as the methodologies utilised when assessing the performance measurements are described. Chapter 5 introduces the applied data sample and presents its statistical characteristics. Results obtained by the empirical analyses are presented in chapter 6. Chapter 7 concludes, describes the limitations found in the analyses and suggests improvements for further research.

## 2 — Literature Review

This chapter provides an overview on the various approaches and empirical findings documented in the literature on post-M&A performance. First, the basic concepts and factors of post-transaction performance measurement are presented. The main part of this chapter is divided into three subsections based on the characteristics of the performance measures applied. Subsection 2.1.1 presents the empirical findings on M&A performance made by studies utilising market-related performance measures, subsection 2.1.2 evaluates on results from studies on accounting-based performance measures and finally, subsection 2.1.3 assesses studies combining both approaches. The last part of this chapter, section 2.2, presents the empirical findings made on the various deal- and firm-specific characteristics applied as explanatory variables in the post-M&A performance literature.

### 2.1 M&A performance

Although M&As are the most popular growth strategy among companies, the empirical evidence on the performance of these events is rather heterogeneous. Several reviews assessing the empirical findings in the literature on post-M&A performance (Bruner, 2002; Das and Kapil, 2012; Thanos and Papadakis, 2012; Ismail et al., 2011) reveal that there is no consensus among scholars on the outcome of such events. While some scholars are sceptical about the performance that such events provide, others see the synergistic effect positively. Another group of empirical researchers also suggests that none of these is in fact true and that on average M&A events do not provide any changes in the company's performance.

With M&As being very complex and structured events, one cannot be surprised that there is such a diversity in theoretical thoughts and empirical findings on this topic. First of all, some scholars (Das and Kapil, 2012; Zollo and Meier, 2008) point out that there is diversity in the very basic definition and application of the term "M&A performance", since it is related to a vast amount of diverse measures, which are strongly field related. For example Das and Kapil (2012) state that findings on M&A performance differ throughout fields of research, where finance related studies suggest a failure rate of up to 50 percent, while studies from organisational and strategic management conclude in the opposite way. This also arises from the complex



value creation puzzle of M&As, where the profits from such events can be generated in various forms, ranging from synergies in the production chain and other operational improvements, to improvements in the governance structure of the company. Further a set of factors, that influence the research methodologies and the subsequent empirical results can be identified from the literature. The most relevant are discussed further in this section.

Zollo and Meier (2008) directly tackle the question of what M&A performance really means and what the different ways to proxy this performance capture. In order to logically assess the differences in empirical findings they categorise the research approaches depending on the *level of analysis*. They distinguish three clearly detectable categories: *i) Task-level*, *ii) Transaction-level* and *iii) Firm-level*. The focus of the task-level of analysis lays on the integration of the firms involved in the M&A event and the performance generated by the various essential tasks adopted during the integration process. The Transaction-level of analysis reviews the complete transaction process and evaluates its performance based on the value that was promised to be created by the event. The final category, the Firm-level of analysis, goes beyond the transaction itself and evaluates the combined entities' post-event performance.

Thanos and Papadakis (2012) also use the term “level of analysis” when differentiating the various performance measures used in empirical studies. However, in their definition this term refers to the “firm-type” analysed. They find that most research is done on the post-event performance of *Acquiring firms*, because the data availability and quality for these companies is best. Another option is to research the performance of *Target firms*. From an accounting-based performance measure view, examining target companies can be difficult due to inconsistencies in the available data, since most target companies have been private before the M&A event and did not publicly share the required accounting data. Another factor making it difficult to examine the target companies' performance is the fact that they sometimes cease to exist after the transaction. The final category, Thanos and Papadakis (2012) present, is a combination of the previous two, researching the *combined entity*.

Another factor revealed by Zollo and Meier (2008) to crucially influence performance study outcomes is the *time-horizon* applied in the analysis. They divide the time periods utilised in post-event performance studies into three categories: *short-, medium- and long-term*. Short- and medium-term studies cover the time from the deal completion until the first phases of the integration process, while long-term studies focus on the whole implementation process and the subsequent performance of the companies. Other studies reviewing the literature on M&A performance also conclude that the time period applied is a key variable in the performance measurement puzzle as it affects the methodologies applied, their shortcomings and the resulting empirical findings (Andrade et al., 2001; Tuch and O'Sullivan, 2007; Das and Kapil, 2012). Most of the studies also divide the time periods applied into short-term, referring to the initial market reaction to the announcement of the deal, and long-term, referring to a period of approximately 3-10 years after the completion of the deal.

The methodology used in examining the performance measures is also diverse. Das and Kapil (2012) highlight two main empirical research approaches utilised, namely the event studies and the outcome studies. The first one evaluates the performance of an event on the basis of abnormal returns gained by the subject during a specific time period around the event. Outcome studies evaluate M&As using change models comparing the pre- and post-event performance of the subject. To control for exogenous performance effects not directly caused by the transaction, the performance is adjusted for industry averages or performance of specifically matched companies. There are several assumptions that have to be made in any kind of study on post-event performance. Most importantly the measure of performance has to be chosen. Further, the start of the event itself has to be defined (which in the case of M&A performance is usually the announcement date of the event), the length of the observation period (from a couple of days before and after the event, to medium and long-term periods), the benchmark used to calculate the abnormal returns, method of calculating the abnormal returns and others. (MacKinlay, 1997; Boehmer et al., 1991; Tichy, 2001; Tuch and O'Sullivan, 2007).

As was distinguished in this subsection, there is a substantial amount of factors influencing any empirical research on the topic of M&A performance. However, the by far most important variable and the one causing the most differences in the literature is the specific performance measure applied. In order to keep the review of the vast amount of the existing literature consistent and relevant to my empirical analysis, I will further divide the findings into three subsections depending on the measures (dependent variables) used to proxy the performance of M&A events. Namely market performance variables (Market related), financial related variables (accounting based) and studies utilising a combination of those two categories.

### **2.1.1 Studies on Market related Measures of M&A performance**

As improvements in market price should reflect the changes in the company's fundamental value, market related studies focus on the abnormal returns, equities provide to their holders in response to an M&A event. Most of these studies reflect on either short-term abnormal returns around the announcement date of the event or long-term performance of the parties involved. Some studies try to also compare both of these and find an empirical link between them. Short-run and long-run studies do in fact show differences in the results as well as specific patterns and limitations, therefore each group will be further examined separately.

#### **Short-term studies**

Generally, scholars agree that in the short-term window around the announcement of the transaction, target companies earn significantly positive returns, while acquiring companies shareholders experience a value destruction. However, the evidence on the influence M&As have on the combined entity's value is rather mixed.

Positive findings seem to be stronger in earlier periods, but results are getting more negative in more recent merger periods.

Andrade et al. (2001), research the performance of M&As during the period of 1973-1998. In order to review the evolution in merger trends during this period, they further divide their set into three subsamples, each including mergers from one of the period's decades. To measure the performance around the announcement date, they utilise an event-study using two different event-windows (-1,1 & -20,close). From their results, acquiring companies experience, on average, negative abnormal returns in both of the event windows (-0.7% & -3.8%). These results get more pronounced in the more recent periods. However, these results lack statistical significance. Target companies on the other hand, experience increases in value around the merger announcement, with an average abnormal return of 16% and 23.8% respectively (during the whole period, from 1973 to 1998). Both of these results are statistically significant at the 1% level. Furthermore, Andrade et al. (2001) review the abnormal returns on the combined entities and conclude with average positive returns being 1.8% and 1.9% respectively during the whole observation period.

Bruner (2002) review the findings from 21 studies on target firm's and 40 studies on acquiring firm's shareholder returns. While the evidence on the target companies returns around the announcement date is concluded to be positive and strongly significant in all the examined studies (results ranging from around 10% to over 30%), the results on acquiring companies returns are rather mixed. From the 40 reviewed studies, 13 show significantly negative returns (ranging from -1% to -3%), 14 show returns not distinguishable from zero and 17 conclude with significant positive returns. Again, they observe the pattern of positive returns being documented in earlier studies and returns having a generally decreasing tendency over time. Further, they investigate 20 studies on the combined entities performance and find 9 reporting negative and 11 reporting significantly positive returns.

Employing meta-analyses on a sample of over 90 studies on post-acquisition performance, King et al. (2004) report, that the performance improvements provided by such events after the announcement date are very close to zero or even slightly negative. Ultimately they conclude that M&As, on average, do not provide any improvements in performance for the acquiring company. Tuch and O'Sullivan (2007) review event studies on market performance of acquiring companies from the UK and US. Their sample includes 16 studies on short-run performance of acquiring companies with event-windows ranging from -4 months to +40 days around the announcement date. In consistence with the findings reported by Bruner (2002), they also conclude that only studies including very early takeovers are showing positive and significant returns for the acquiring companies (Asquith et al. (1983) on US and Franks and Harris (1989) on UK acquirers). The rest of their sample shows either insignificant results or rather negative performance.

As short-term event studies capture only a very short window of actions around the announcement date, they generally assume the markets to be efficient and rational. Only if the markets were fully efficient and rational, this window of events would reflect the investors real long-term expectations about the fundamental value of the companies and the synergies that will arise from the M&A event (Tuch and O'Sullivan, 2007). This assumption is however more or less refuted in the literature, where researchers conclude that the stock market over- or under-values the impact of M&As around the announcement date of the event. A longer time horizon is needed to incorporate all the new information and possible outcomes of such events correctly (Andrade et al., 2001; King et al., 2004; Tuch and O'Sullivan, 2007; Zollo and Meier, 2008). Therefore measuring M&A performance, assuming rational markets can lead to wrong outcomes, as the market's initial reaction is not able to fully evaluate the future changes in the long-term fundamental value. In their empirical analysis, Zollo and Meier (2008) found, that results from short-term event studies do not relate to any of the other proxies of M&A performance they applied (long-term financial, accounting and strategic measures). They conclude that short-term performance measures do actually provide only little understanding about the actual future performance provided by the event. In other words, the market is probably not able to efficiently and rationally incorporate all the information and therefore misvalues the effects of the event. Some scholars however, still see these short-window event studies as the most reliable source of shareholder value measurement (Andrade et al., 2001). These implications are also supported by the behavioural literature on M&A performance.

The behavioural literature also links the acquiring companies post-event performance to their relative market misvaluation prior the transaction announcement. Rhodes-Kropf et al. (2005) find that M&A activity is positively correlated with the level of misvaluation in the market, meaning that merger activity is dominated by overvalued bidders, which have significantly higher firm specific errors in their market-to-book ratios than the targets they acquirer. Another interesting finding they make is that low long-run value-to-book companies acquirer high long-run value-to-book targets, meaning that acquirers are probably well aware of their mispricing (overvaluation) by the market and use this position to cash-in on it by acquiring firms with high future growth prospects. Roll (1986a) tackle the explanation of post-M&A performance by introducing the *hubris hypothesis*. They conclude that while an acquires price falls, the targets price rises because of the premium paid, but also that on average by paying excess premiums for targets and due to wasted resources and unproductive activity, the M&As in-fact decrease the combined entity's overall value. Another research on the hubris hypothesis by Malmendier and Tate (2005), concludes that more optimistic (overconfident) CEO's are more likely to complete a merger and that investors are generally more sceptical about offers made by these CEOs and negatively reflect this in their expectations on the company's future value.

## **Long-term studies**

Studies on long-term post-M&A performance are even more sceptical about the value creation of such events, with some researchers suggesting that the long-term abnormal returns are not only negative, but erase the positive abnormal returns gained in the short-term window around the announcement date, making the overall event value destroying Andrade et al. (2001). In their already mentioned review, Tuch and O'Sullivan (2007) research 14 papers examining long-run post-M&A performance and conclude that the results point towards either negative or statistically insignificant result.

In an earlier study on long-run performance, Malatesta (1983) examines 256 acquiring companies and finds, that these companies earn significant positive abnormal returns in the period of -60 months up to the month of the event and negative abnormal returns in the one-year period after the bid. Agrawal et al. (1992) re-examine the anomaly of the efficient market theory caused by the phenomenon of post-M&A underperformance of acquiring companies. Their sample covers transactions over a time period of more than 30 years. Even after controlling for size and beta effects in their methodology, they conclude that in a 5-year post-merger period acquiring companies suffer a loss in wealth of about -10%. This conclusion provides another view on the earlier mentioned hypothesis of markets not being able to immediately efficiently and rationally alter their expectations about the future value in reaction to the deal announcement.

Loughran and Vijh (1997) research long-run abnormal returns on 947 transactions from 1970-1989. They use a matching-firm methodology to calculate the abnormal returns, controlling for size and book-to-market value effects. While their focus lays on specific deal characteristics and their influence on the acquiring companies performance (the method of payment effect is further elaborated on in section 2.2), the conclusion they give on the average performance of the acquirers is a negative abnormal return of -6.5% in the five years after the transaction.

Mitchell and Stafford (2000) research the abnormal returns of acquiring companies over a three-year period after the completion of the transaction. In their methodology, they specifically reflect on the issue of positive cross-correlations of abnormal returns within transaction samples. They correct for samples cross-dependence and find that in their equally-weighted portfolio, acquirers do on average gain significant negative abnormal returns of -5%. Gregory and McCorriston (2005) investigate long term returns of UK based firms acquiring US based targets and find that over a three and five year post-event period, these acquirers experience significant negative returns of -9% and -27% respectively.

Dutta and Jog (2009) on the other hand, study 1300 transactions by canadian acquirers in the period between 1993 and 2002. Applying an exhaustive amount of research methodologies and correcting for various

methodological discrepancies, they find that acquiring companies from their sample do actually not realise negative abnormal returns and also do not fall for the overpayment bias.

It is also important to mention, that studies on long-term post-event performance are limited by several factors and therefore the results can be misleading. Firstly, long-term studies on M&A performance are surrounded with a large number of methodological issues (Tuch and O'Sullivan, 2007; Mitchell and Stafford, 2000; Andrade et al., 2001). Both Tuch and O'Sullivan (2007) and Andrade et al. (2001) reflect on Malkiel and Fama (1970) and state that evaluating long-term abnormal performance consists of a joint-test of the efficiency of stock markets (whether abnormal returns exist) and the market model used to calculate the abnormal returns itself. Another problem is the testing of statistical significance where standard t-tests fail to perform correctly due to the skewness of the long-run returns (Tuch and O'Sullivan, 2007). Mitchell and Stafford (2000) reflect on the results of previous studies by stating that these do not take into account the cross-correlations within the sample and falsely assume the observations to be independent. Therefore, the positive abnormal returns resulting from such studies are misleading. Andrade et al. (2001) conclude that due to the previously mentioned and other methodological issues, abnormal returns should be seen only as estimates of M&A performance that can be rather imprecise. Secondly then, the dataset itself can bear a biased view on the acquiring companies market performance, since the market can misvalue equities during certain periods and defer the market value from the fundamental value. The companies can also participate in other major strategic decisions during the observed period (other M&As etc.) or just simply mismanage the assets. Overall it is therefore difficult to isolate the impact of the transaction itself on the companies performance.

### **2.1.2 Studies on Accounting based Measures of M&A performance**

The popularity of accounting based measures in M&A performance research has seen a clearly increasing trend. While in the 1960s and 1970s there has only been a handful of such studies, from the 1980s onwards, the amount has increased substantially (Thanos and Papadakis, 2012). One of the reasons scholars are paying more attention to long-term accounting based measures of post-M&A performance can be the fact that they are better at reflecting the synergies obtained by the M&A than market related measures (Hitt et al., 1998; Tuch and O'Sullivan, 2007).

Throughout the years of research there has been a vast quantity of accounting based measures applied in the literature (Das and Kapil, 2012; Thanos and Papadakis, 2012). In order to categorise the findings in a logical way, I applied the approach by Thanos and Papadakis (2012) and divided the literature into three groups based on the character of the accounting-based performance measure applied: *a) Return ratios, b) Growth measures and c) Operating cash flows.*

### **Studies on Return ratio measures**

In an early study on post-M&A operating performance, Meeks (1977) examine 233 transactions of UK acquirers completed between 1964 and 1972. While they find that the combined entities operating performance increases by a significant 0.114% in the year of the event, in every of the 5 years subsequent to it, the combined entity generates negative abnormal operating profits of up to -0.109% (also significant). Results from later than 5 years post-acquisition were not statistically distinguishable from zero.

In their 1989 study, Ravenscraft and Scherer (1989) researched the performance of mergers between 1975-1977 using data on pre- and post-event operating profitability (Return on assets controlled for industry and accounting differences) of 471 companies. They find that on average the operating profitability of the acquired companies decrease sharply after the merger and therefore such events are value destroying.

Andrade et al. (2001) use a methodology of time-series consisting of annual cross-sections adopted from Fama and MacBeth (1973) to evaluate on the abnormal operating performance (measured as cash flow to sales). Based on their sample of approximately 2000 merger between 1973 to 1998 they conclude that the operating margins of the combined entity on average improves after the merger relative to the industry benchmark. Further they show that after the event, there is an improvement in the operating margin of the combined entity of approximately 1% on average. All of their findings are statistically significant.

### **Studies on Growth measures**

Dickerson et al. (1997) study the impact of acquisitions on UK companies over a long-term period (up to 18 years). Their data sample consist of 2941 acquisitions between 1948 and 1977. They compare the pre- and post-event performance of acquiring companies as well as their performance relative to non-acquiring companies on the levels of growth and profitability. They state that their measure of internal growth is outperforming the measure of acquisition growth and that there is a negative relation between acquisitions and long-term performance with acquiring companies underperforming non-acquiring companies by a significant -2.4%.

### **Studies on Operating cash flows**

Healy et al. (1992) investigate the post-event performance of combined-entities, measured by operating cash-flow returns (pretax operating cash flow returns on assets). Even though this is a return ratio measure, the authors emphasise that their focus lays on the operating cash flows rather than the assets and therefore scale the assets employed by market values to obtain a comparable measure of performance. From their sample consisting of the 50 biggest mergers between US companies in a time period from 1979 and 1984, they conclude that these companies are able to improve their asset productivity, resulting in higher operating performance

(operating cash-flows) relative to their industry benchmark. However in their 2001 paper Ghosh challenge the findings of Healy et al. (1992, 1997) when confirming that their results are likely to be upward biased because companies undertake such events during or after a period of highly positive performance and therefore outperform their industry medians in the post event period. In their own research methodology, Ghosh (2001) reflect these reservations by using matching firm returns to control for superior pre-event performance. They conclude that there is no evidence of increasing post-event operating performance of companies involved in M&A.

Overall then we see, that the evidence on long-term performance of M&As as seen through operating (accounting-based) performance measures is again rather mixed and no unambiguous result can be derived.

### **2.1.3 Combined approach studies**

As already stated, given the complexity of corporate events such as M&As, it is difficult or nearly impossible to capture the full impact on the company's performance through one specific measure. Even though there has been a substantial amount of performance research, some scholars (Thanos and Papadakis, 2012; Schoenberg, 2006; King et al., 2004) point out that in order to better understand the transformation of synergies and thereby the long-term value effects on the companies, there is a need for future research to study inter-relations between the different measures of performance and to combine their outcomes.

Sirower and O'Byrne (1998) use a specific value-based benchmarking approach based on excess improvements in EVA to evaluate on the companies post-M&A performance. These are calculated for a 5 year post-event period and then discounted into a PV measure of performance. Additionally, they construct a short-term abnormal return measure and a PV measure of long-term excess market returns. From examining their sample of 41 major acquisitions, they found that the average abnormal return around the announcement date was -3.6%. Moreover for 32 observations the EVA measure is found to be negative. Further, they show that in 26 out of the 41 observed transactions their PV EVA measure indicates the same direction of performance as the initial market reaction. The same holds for 30 out of the 41 observations for the long term market performance measure. Finally Sirower and O'Byrne (1998) show the correlations between the performance measures they used (namely the short-term market reaction, the present value of excess 5Y shareholder return and the capitalised present value of excess EVA improvement) and the dollar premium paid for the target. From this analysis they conclude that, firstly the present value of LT excess stock market returns is strongly correlated with the initial market returns, secondly that the premium paid is negatively correlated with both market performance measures and finally that the EVA performance measure is strongly positively correlated with both of the market performance measures. The last finding is supported by the general conclusion that the EVA



measure is strongly related to the fundamental value and hence with the market return of a company (Stewart, 1991; Grant, 2003).

In one of their research's subsection, Ghosh (2001) examine the relation between post-event improvements in operating performance (measured through improvements in operating cash flows) and abnormal stock returns of the acquiring company around the announcement date. Specifically they test if the operating performance can explain these abnormal returns and conclude that there is no correlation between those measures and that the coefficients for abnormal returns resulting from their regressions are insignificant.

Extending the findings and methods applied by Schoenberg (2006), Papadakis and Thanos (2010) review 50 acquisitions by Greek companies using , criteria. Utilizing a multi-dimensional model including a market related measure (CAR), an accounting based measure (ROA) and manager's subjective assessments (questionnaire) as proxies for M&A performance. Overall the results from their three models suggest failure rates from 50% to 60%. More over they found that there is a weak positive correlation between accounting based measure and managers subjective answers in the questionnaire and in that CAR is not related with either of the two measures. However, their results lack statistical significance.

However, the amount of research actually focusing on the relations between different measure of M&A performance is yet relatively scarce. With combining measures reflecting on the various levels and processes within M&As, there might come a better understanding of the post-event performance as the specific value-creating or destructing elements could be revealed. Another suggestion made by King et al. (2004) is for researcher to utilise similar methodologies in their analyses rather than coming up with new ones. In this way, studies and their outcomes would become more comparable.

## **2.2 Bid characteristics determining performance**

In order to explain and allocate the performance provided to companies by M&As in the post-event period, scholars try to identify the key variables that determine the success or failure of these events. As already highlighted several times, M&As and their subsequent integration process are very complex events. Therefore it is not surprising that the amount of explanatory variables utilised to explain the performance is enormous. In their peer-review of "just" 46 papers on M&A performance Das and Kapil (2012) identify 172 different explanatory variables used to explain the performance measures. These can be again sorted by the level of analysis (*firm-, industry-, macro-level*) or their specific field of study (*Strategy, Operations, Finance, Human resources etc.*). The ones most commonly examined in the finance-related literature on M&A performance are the method of payment, the relative size of acquirer and target, the attitude of the event and the industry

relatedness business overlap (Healy et al., 1997; Das and Kapil, 2012; Tuch and O'Sullivan, 2007; Andrade et al., 2001; King et al., 2004). Findings on these will be further discussed in detail.

### **Method of payment**

The method of payment is an important variable in the post-event performance puzzle as it bears implications about the acquirers pre-event conditions, which can be useful for investors when altering their expectations on future performance. Specifically, Rhodes-Kropf et al. (2005) found, that acquirers that are overvalued in the pre-event period use stock as payment for their acquisitions and thereby cash-in on their mispricing. On the other hand, relatively undervalued acquirers are more likely to use cash as the method of payment. Investors tend to know about this behaviour and react by being skeptical towards equity acquirers and reward cash acquirers. Therefore, the method of payment can have implication for some part of the post-event performance of the acquirers. King et al. (2004) also found that on average, acquirers in equity financed transactions experiencing significantly negative abnormal returns in the post-event period. They imply that equity bids should be signs for target shareholders to liquidate their positions and “cash-in” on their stakes in the company.

In their 1997 paper, Loughran and Vijh examine the impact of the method of financing on the gains in wealth of acquiring shareholders. From their sample of 947 acquisitions they find that, on average, stock returns of cash acquirers outperform returns of stock acquirers. Specifically, while tender offers financed with cash experience on average highly positive returns of 18.5% relative to matching companies, mergers financed with stock receive negative abnormal returns of -25.0% on average.

Healy et al. (1997) research the impact of the transaction's method of financing on post-event performance of the 50 largest transactions during 1979-1984 using three methods of payment: *i) Stock and Debt*, *ii) Cash and Debt and iii) Cash and Stock*. Contradicting to their assumption of an acquirers cash flow returns decreasing after an equity financed transaction, they find that when no premium paid for the target is assumed the cash-flow returns for *Stock and Debt* financed transactions were a significantly positive 4.4 percent. For the other two measures, the cash-flow returns were also positive, but lacked statistical significance. Further they state that the premiums paid for *Stock and Debt* financed transactions were smaller and that 82% of these transaction showed positive cash-flow returns after the event.

Lu (2004) also challenges the general findings from previous research leaning in the direction of M&A events being value destroying for the bidders shareholders. In her study she examines a sample of 907 consummated and 335 unconsummated stock bids over the period of 1978-1996. To sufficiently test her hypothesis of stock financed mergers not being value destructive, she utilises event-studies on short-term and long term market performance using several different methodologies for each of the time-horizons, to account for the

methodological issues coupled with each of them. Further, she investigates the post-event operating performance of the sample acquirers on the level of ROA and ROE. Even though some of the intermediate results she obtains show significantly negative performance, she concludes that when using a properly adjusted benchmark (for effects on size, Book-to-market and market risk) the results actually suggest that stock-financed mergers do not destroy value. However, in their review of empirical studies, Tuch and O'Sullivan (2007) state that there is strong evidence in the literature, that cash bids outperform stock financed bids in the short- and long-run.

### **Industry and business relatedness**

As the main goal of most M&As is to acquirer synergies for the firm's business development, these synergies are representing a crucial part of the post-event performance. Having an overlap in the acquirer's and target's businesses increases the likelihood of achieving these strategic synergies from the transaction (Healy et al., 1997).

In their study, Healy et al. (1997) focus on the business overlap of the acquiring and target company using three defined levels of business overlap. Their results confirm the general assumption of higher business relatedness correlating with higher post-merger performance. In fact for their high business overlap subsample, 85% of the cash flow returns were positive post-event, while for the lowest business overlap subsample more than half were negative with a median value of -0.6%. Bruner (2002) conclude that higher business overlap between the acquirer and target is positively related to post-event returns since these are associated with better synergies. Further they state that diversifying M&As are performing worse in the post-event period. Park (2002) also examine the relationship between companies post-event performance and diversification through M&A. First they elaborate on the definition of the relatedness hypothesis arguing that previous research has defined the relatedness only as similarities in business and products, while companies are able to experience synergies from M&As when there is an overlap in the essential resources and capabilities. In their sample of 229 acquisitions they identify related and unrelated transactions and test their performance on several pre-acquisition explanatory variables. They find that the pre-event profitability of industries has a negative relation on the industry relatedness of the acquisition.

From the above mentioned it seems, that while business relatedness is an important indicator for M&As performance, it is also crucial to correctly identify these relations by evaluating on the companies business similarities and the possibilities of strategic asset utilisation.

### **Premium paid**

The size of the premium an acquirer is willing to pay above the target's current market price does directly reveal its perception about the future performance improvements. Therefore this variable should be a strong predictor of the post-event performance of an acquiring company. Yook (2004) uses a binary variable for the size of the premium paid (High and Low premium groups) and compares the outcomes of their performance (measured by the post-event EVA and the difference between the pre- and post-event EVA). They conclude that most of the results obtained are not statistically significant, however if anything they suggest high premium deals outperforming low premium deals.

### **Size effects**

Tuch and O'Sullivan (2007) state three explanations that researcher have suggested on why larger targets might relate to better post-event performance. Firstly, targets that are larger in absolute terms can be acquired by a smaller amount of bidder companies, leading to better bargaining power on the acquirers side and subsequently more attractive deals (Roll, 1986b). Secondly, targets that are large relative to the acquirer have a greater impact on the combined entity's future performance (Bruner, 2002). This also implicates that these transactions represent a major strategic decision for the acquirer and further major decisions or changes in the business is less likely to happen in the coming periods. From this we can assume that the post-event performance is more influenced by the transaction and less by other unobserved factors (Healy et al., 1992). Finally, Tuch and O'Sullivan (2007) highlight that findings contradicting the hypothesis of larger targets generating better performance for the acquirers come from studies including smaller bidders. These results can therefore be caused by a negative size effect for the smaller bidders rather than a negative performance effect coming from the relatively larger target companies (Moeller et al., 2004).

### **Book-to-Market Ratio**

Another interesting firm-specific factor is the Book-to-Market ratio of the acquiring company. Together with it's reversed form, the market-to-book ratio, it is used to assess of the companies relative market value. In other words, the BTM can be used as an indicator of the companies over- or under-valuation by the market. The conclusions made by researchers on the acquiring company's pre-event relative market value is of mixed character. Some indicate a negative performance relation between the markets relative overvaluation and the post-event performance of the acquirer (McLaughlin et al., 1998). As already mentioned previously, Rhodes-Kropf et al. (2005), specifically point out that over-valued acquirers do cash-in on their high share price by engaging in stock-financed M&As and experience negative performance afterwards due to their relatively lower

real operating performance. Heron and Lie (2002) on the other hand, research M&A performance using the Market-to-Book ratio and find the opposite effect to be true.

To conclude this chapter a short summary of the most important findings so far documented in the literature on M&A performance, will follow. We have seen that there are various measures utilised in the research assessing M&A performance, ranging from short- and long-term market related measures to accounting based measures of operating performance. Generally the outcomes were of mixed character. Some researchers favoured the hypothesis of M&As having on average a positive effect on the company's future performance, others concluded with opposite findings. A lot of the researchers revealed methodological issues with their specific performance measures or concluded with results lacking statistical significance. For that reason I finally favour the rather negative hypothesis of M&As being on average value destroying events. I have further reviewed some of the firm- and deal- specific factors utilised in the empirical analysis to attribute the performance. It seems that a combination of specific factors is able to explain the performance patterns observed. Even though M&As still remain a largely individual action that is influenced by the specific companies involved and their ability to effectively identify and further integrate the synergies obtained by the M&A event.

### 3 — Hypotheses

As presented in the literature review in Chapter 2, there is a large disparity within the conclusions made by the empirical literature on post-M&A performance. Findings differ significantly throughout the various fields of analysis and methodologies applied. Some of the main factors causing this inconsistency are the time period applied, the level of analysis and the measure applied to proxy the performance of the event. However, even when using similar performance measures on comparable event samples, researcher are not generally able to find matching conclusions. This phenomenon can be attributed to differences in methodological details applied in the research, which arise from discrepancies in the scholar's theoretical views on the effects that M&A events have on the company's performance. Therefore it is relevant to further re-examine this topic, since many of the question and hypothesis examined before do not find consistent conclusions.

To logically decompose the performance evaluation, I first state three main research questions on the base of which I subsequently build the hypotheses further in this chapter. I start with stating the most basic question as: *What is the effect of M&As on the acquiring company's post-event performance?*

After having answered this question, the next logical step is to determine the success or loss factors of such an event and therefore the second question can be expressed as: *How do specific characteristics affect the acquiring company's post-event performance?*

Lastly, having seen different approaches to measuring the post-event performance of M&As and different time-periods applied, one has to wonder what the relations between these measures are. Especially when utilising a measure such as EVA, that from definition should be a valid representation of the company's fundamental value, the last research question arises: *How does the EVA measure relate to different market related measures of post-event performance?*

#### **Post-event operating performance**

While there has been a substantial amount of research done on short- and long-term stock performance and different traditional accounting based performance measures, research applying the EVA as a measure of post-

M&A performance has yet been scarce. Ismail et al. (2011) classify EVA as a market related measure, while I argue that it rather is a combined measure. The main reason for this assumption is the fact that the EVA combines accounting information about a company with variables determined by the public markets (such as the cost of capital).

Although a significant portion of the research is pointing in the direction of M&A events providing positive post-event performance improvements for the acquiring companies (Healy et al., 1992; Andrade et al., 2001), in their 1998 paper, Sirower and O'Byrne present the following quote by Warren Hellman, former head of Lehman Brothers (1994): "So many mergers fail to deliver what they promise that there should be a presumption of failure. The burden of proof should be on showing that anything really good is likely to come out of one." In this sense I am staying on the sceptical side of this argument and define the first hypothesis as follows:

*H1.1: Major strategic M&As are on average value destroying events for the acquiring company.*

By utilising the required improvement in EVA benchmarking methodology introduced by Sirower and O'Byrne (1998), it can be directly observed if the performance improvements provided by the transaction justify the price paid for the target including the bid premium. Following the sceptical rationale from the previous hypothesis and accounting for the negative results already presented in the study by Sirower and O'Byrne (1998), I state the next hypothesis:

*H1.2: Acquiring companies are not able to provide enough improvements in operating performance to justify the deal.*

## **Deal characteristics**

As presented in the literature review, merger waves are dominated by highly overvalued bidders that use their overvalued stock as deal currency in order to profit from the market's misvaluation. The method of payment therefore implicitly projects the manager's view on the company's value. Stock bidders see themselves as overvalued while cash bidders think their stock price is undervalued and therefore using it as payment for the target would harm its shareholders. Overvalued bidders tend to have also inflated operating performance variables and these are likely to decrease in the post-event period. Therefore, I state the following hypothesis regarding the transaction's method of payment as:

*H2.1: Companies financing the transaction by cash realise better post-event operating performance than those financing the transaction by stock.*

The literature suggests that business overlap is generally having a positive impact on post-M&A performance as it provides better synergies. Further it allows for better integration of the target company, which

should lead to a more efficient utilisation of the new assets. The integration process should also be less costly for companies within similar industries, providing them with a performance advantage. Moreover there is evidence that diversifying mergers tend to be value destroying Bruner (2002). As the sample of M&A events further examined in this thesis is aiming at major strategic transactions that should not only have a material impact on the acquiring company's performance, but also on the future business strategies, I will test the following hypothesis:

*H2.2: Transactions in which the acquirer and target are operating in similar industries realise better post-event performance.*

The premium paid for the target represents an explicitly quantified view on the future synergies and other performance improvements that the acquirer sees to obtain from the transaction. Previous research however found, that even though the acquiring company's executives do expect synergistic gains from the acquisition, these are often being overvalued. Part of the premium can also act as a pure transfer of value from the acquiring firm's shareholder to the target's shareholders in order to complete the transaction, not reflecting any additional increase in economic value Roll (1986b). Acquirers paying higher premiums should realise better post-event performance, since their outlook about the possible future synergies is more optimistic and they also undertake higher risk. Therefore, I state the following hypothesis:

*H2.3: Companies that pay higher premiums for the targets perform better in the post-event period.*

Various forms of size have been widely elaborated in the empirical literature. Generally, researchers conclude that larger target's size is positively associated with the company's post-transaction performance (Healy et al., 1992; Tuch and O'Sullivan, 2007), while the opposite is likely to hold true for the acquirer's size. As the further examined transaction sample consists of major strategic transactions, the size factor is likely to have strong explanatory power, regarding the post-event performance. Therefore, I state the following two hypotheses regarding the size factors:

*H2.4A: The acquire's size is negatively related to it's post-event performance.*

*H2.4B: The relative size between target and acquirer is positively related to the acquirer's post-event performance.*

As elaborated on in the literature review, scholars found a negative relation between the acquirer's overvaluation prior to the M&A event and it's post event performance (McLaughlin et al., 1998; Rhodes-Kropf et al., 2005). This phenomenon is associated with the hubris hypothesis of overconfident CEO's engaging in transactions. Executive's overconfidence is also likely to be found in major strategic transactions and therefore,



testing for the overvaluation factor is appropriate for the further applied dataset. Hence, I state the following hypothesis:

*H2.5: The acquirer's Book-to-Market ratio (BTM) in the pre-event period is positively related to its post-event performance.*

### **Measure relatedness**

As suggested by Thanos and Papadakis (2012), future studies should combine more different types of measures within one research and evaluate on their inter-relations. Therefore, it is only reasonable to examine the interdependence between the various performance metrics and the implications that such relations introduce for the performance puzzle within the same sample of observations.

Sirower and O'Byrne (1998) found that there is a strong relationship between the EVA performance measure and the initial market reaction as well as the present value of LT excess market return. In order to re-examine this finding, I will specifically focus on the relations between the various EVA measures of performance and market related performance measures.

As suggested by researchers, the market is initially not able to fully quantify the impact of the M&A event and therefore over- or under-reacts in the period around the announcement. To examine this relation, I state the following hypothesis:

*H3.1: The initial market reaction is able to reveal the right direction of the acquiring company's post-event operating performance, but fails to correctly quantify this performance.*

In the long-run, the market should alter and refine its expectations about the change in value of the acquiring company, generated by the deal. Therefore, the company's market performance should come closer to the operating performance measured by EVA. The last hypothesis is stated as:

*H3.2: The acquiring company's operating performance is correlated with its long-term market performance.*

## 4 — Methodology

This section provides an overview of the different measures, approaches and models utilised in order to test the stated hypotheses. Firstly, the concept of the Economic Value Added as the cornerstone performance measure used in this work is introduced. Further, two methods applied to calculate the post-event performance using EVA, are presented. Section 4.3 provides an overview on the regression models applied to attribute firm- and deal-specific characteristics to the post-event performance. The last section introduces additional market related performance measures used in the later comparison analysis.

### 4.1 Economic Value Added

The *Economic Value Added* or simply EVA®<sup>1</sup>, is an analytical tool that was introduced in the 1980s by G. Bennet Stewart and Joel Stern in order to provide an alternative measure of company performance and wealth creation. The EVA measure has many different application opportunities from security pricing, real investment wealth creation measurement to executive rewarding schemes and macro analysis (Grant, 2003).

In his 1991 book, *The Quest for Value* Stewart states that EVA is the best practical performance measure, beating such as earnings, earnings per share or growth, as it adds the factor of the direct and indirect cost of capital to the sole accounting figures. This argument is further supported by stating that EVA comes the closest to capturing the true economic profit of an enterprise. Stewart (1991) reveal that EVA is closely linked to the creation of shareholder value over time. Grant (2003) also points out that EVA is closely related to the requirement of shareholder wealth maximisation when accounting for the required cost of capital in performance measuring.

Specifically, this statement about the EVA measure became the topic for much empirical research, as scholars tried to identify (or disprove) the linkage between a company's EVA and its stock price return. In their 2010 paper, Sharma and Kumar analyzed 112 research studies concerning the advances made about the EVA measure. There they point out that 58 out of the 112 papers are examining the relationship between

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<sup>1</sup>EVA® is a registered trademark of the Stern Stewart Co.

the EVA measure and stock returns. They find that the majority of these papers confirm that EVA is more associated with stock returns than other accounting based performance measures (Lehn and Makhija, 1997; Maditinos et al., 2006) and that it performs better at deriving stock prices (Stewart Iii, 1994).

Another important part of the EVA concept is its relation with the Market Value Added (MVA), which can be described as the present value of the companies future expected EVA (Grant, 2003). This relation implies that the company's future EVA is closely related to the fundamental value of its market debt and equity. The implication of this relationship then is that firms with positive expected future EVA should experience a growth in stock price, since their profits exceed the cost of capital and thereby increase the companies MVA. In the opposite way, negative expected future EVA implies that the companies NOPAT falls short of the dollar value of its cost of capital and so this firm is value destroying and its share price should be decreasing as its intrinsic value decreases (Grant, 2003). The relation between the company's share price, MVA and future expected EVA is very important for the empirical analysis in this thesis as it sets the ground for the value based benchmarking methodology of M&A performance I will apply further. The exact methodology will be further described in Section 4.2.2.

### Calculating EVA

From a technical point of view, EVA represents the value of the company's *NOPAT* (Net Operating Profit After Tax) less its *Invested capital* multiplied by the *Cost of Capital*. Mathematically this can be portrayed as:

$$EVA_t = NOPAT_t - (Invested\ Capital_{t-1} \times CoC) \quad (4.1)$$

The second term in equation 4.1 is also referred to as the dollar value of the cost of capital Grant (2003). In order to obtain the three essential variables required to calculate a company's EVA, the following approaches and assumptions are utilised.

*i) NOPAT.* The net operating profit after taxes is one of the key metrics in corporate finance and valuation. It reflects the profit a company has created from its invested capital in key operations<sup>2</sup> adjusted for the taxes from these operations. Koller et al. (2010) show three fundamental characteristics of the NOPAT<sup>3</sup>. First, it makes the profit measure independent of the company's current capital structure. Second, it excludes any profit (loss) items generated by other than the operating assets that are included in the invested capital. And third, since the NOPAT includes only the company's profit from key operations, the taxes over these profits are adjusted for non-operating items and tax shield effects.

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<sup>2</sup>Meaning the core business of the company for which it was founded or for which it is currently operated.

<sup>3</sup>In their book they call this measure the net operating profit less adjusted taxes (NOPLAT)

The NOPAT can be calculated as  $EBIT - (1 \times t)$  where  $EBIT$  (Earnings Before Interest and Taxes) represents the company's operating profit and  $t$  is the corporate marginal tax rate.

ii) *Invested Capital*. A company's invested capital includes all funds raised by the company and utilised in the key operations of this company. The invested capital includes the operating assets and also the operating liabilities of the company and can be calculated as the sum of the company's total Long-Term Debt, Preferred Stock (Carrying Value), Minority Interest (Balance Sheet) and total Common Equity, excluding Deferred income tax reserves and Investment tax credit.

iii) *Cost of capital*. When constructing a public company's EVA, the cost of capital is most commonly calculated as the *Weighted Average Cost of Capital* (WACC) which represents the return on the company's current asset base that is required to satisfy the equity and debt holders of that company. This approach estimates the cost of capital as the weighted average of the *Cost of Equity* (CoE) and the *after-tax Cost of Debt* and can be written in the following form:

$$WACC = CoD(1 - t) \times w_d + CoE \times w_e \quad (4.2)$$

where  $t$  is the tax rate,  $CoD(1 - t)$  the after-tax cost of debt and  $CoE$  the cost of equity. The weights,  $w_d$  for the debt part and  $w_e$  for the equity part, are determined by the company's *target capital structure*.

The cost of debt should reflect the company's cost of issuing new debt. The company's cost of debt can be estimated in several ways mostly depending on the company's listing status (public vs. private) and its credit worthiness. A commonly utilised approach to estimating the CoD is adding a credit default spread to the risk free rate. Thereby, the riskiness of holding the company's debt is reflected. This yields the pre-tax cost of debt that is further adjusted for the tax shield on debt interest.

There are several methods to estimating the cost of equity, however the most commonly used is based on the capital asset pricing model (CAPM). The CAPM is a special example of the Markowitz portfolio theory and was published in articles of several scholars in the 1960's independently on each other. Its general form is  $E(r_i) = r_f + \beta(E(r_m) - r_f)$  and when applied in the cost of equity calculation it can be expressed as:

$$\begin{aligned} CoE &= r_f + \beta(r_m - r_f) \\ &= r_f + \beta \times MRP \end{aligned} \quad (4.3)$$

where  $r_f$  stands for the risk free rate of return,  $\beta$  is the company's assumed beta factor and the term  $(E(r_m) - r_f)$  is the expected excess market return, also referred to as the market risk premium ( $MRP$ ).

## 4.2 Performance measurement through EVA

There are several setbacks documented in the literature evaluating M&A performance based on conventional accounting measures. Firstly, there is a rather high number of different measures utilised in research and a comparison of the result is therefore complex if not impossible (Thanos and Papadakis, 2012; Sirower and O'Byrne, 1998; Tuch and O'Sullivan, 2007). Secondly, given the multidimensional and complex character of M&A events, it is unlikely that one specific accounting measure can capture the whole impact of such events on the companies' post-event performance. For this reason there remains the possibility of misinterpretation due to lack of explanatory power (Thanos and Papadakis, 2012). Finally, differences in accounting conventions and specifically differences between the *purchase* and *interest-pooling* approaches of post-M&A accounting do affect the results derived from accounting based performance measures (Ravenscraft and Scherer, 1989; Healy et al., 1992; Sirower and O'Byrne, 1998; Thanos and Papadakis, 2012). While I resolve the third issue with the choice of the observation period for the data sample<sup>4</sup>, the first two can be tackled by using a value based performance measure such as EVA (Sirower and O'Byrne, 1998). Another advantage of EVA as a performance measure is the fact that it combines the company's accounting data with information from the financial markets (in the form of the company's cost of capital).

Having chosen the appropriate performance measure, there is a second important decision to be made when measuring and evaluating the post-event performance. Namely, defining an appropriate benchmark. I decided to utilise two different benchmarking approaches. The first one, a more conventional outcome study approach where the post-event performance is evaluated relative to the pre-event performance of the company. The second approach is a more innovative method of performance appraising, built upon the methodology by Sirower and O'Byrne (1998). This approach tries to fully utilise the fundamental value-based nature of the EVA measure. The general methodology as well as the specific assumptions of application concerning this research are discussed further.

### 4.2.1 Past performance benchmark

The change model approach compares the companies pre-event EVA with the post-event EVAs. The observation period stretches from five years prior the event until five years after the event. To obtain a comparable benchmark for the post-event performance, pro-forma combined entity EVAs are constructed in the pre-event period in line with the approach presented by Healy et al. (1992) and Yook (2004). The pro-forma entity's EVA

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<sup>4</sup>Under the statement No. 141 issued by the Financial Accounting Standards Board in 2001, the interest-pooling accounting approach is no longer allowed to be used. Further implication can be found in section 5.1

in the pre-event period is calculated by summing the acquirers and targets EVAs. The post-event EVAs are calculated for the surviving acquirer (new combined entity).

Besides the non-adjusted raw EVA, an industry-adjusted EVA is constructed in order to control for industry specific effects. This is calculated for the acquirer and target separately in the pre-acquisition period and for the combined entity in the post-acquisition period on the basis of the acquirer's industry. To control for size effects within the industry group relative to the sample company, the industry EVA is scaled by the size of invested capital. The industry-adjusted EVA is calculated as:

$$EVA = EVA_{i,t} - (Industry\ EVA_t / Industry\ Cap_{t-1}) \times Cap_{i,t-1} \quad (4.4)$$

where  $EVA_{i,t}$  and  $Cap_{i,t-1}$  are the company's EVA and Invested capital respectively in year  $t$ .  $Industry\ EVA_t$  is the total EVA of company  $i$ 's matching industry in year  $t$  and  $Industry\ Cap_{t-1}$  is the matching industry's total Invested capital.

The EVA for each of the pre- and post-event years is calculated as the median of all transactions. An aggregated median for the whole pre-event and post-event periods will be calculated. Finally, the difference between the pre-event aggregated median EVA (for the whole period) and the EVAs in each of the post-event years will be presented. In order to test the statistical significance of the difference between the pre- and post-event performance (measured by the median EVAs) a non-parametric Wilcoxon rank sum test is utilised, as suggested by studies using similar methodologies (Barber and Lyon, 1997; Yook, 2004). There are two reasons for that, firstly the sample size is relatively small and secondly the sample is probably not normally distributed so a standard t-test could result in misleading outcomes.

To assess the earlier stated hypotheses regarding the specific firm- and deal-characteristics influencing the post-event performance, the main sample will be further divided according to three characteristics. Using the approaches by Yook (2004), firstly, by the method of payment (cash vs. stock), secondly by the companies business overlap (low vs. high) and finally by the relative premium paid (low vs. high) will be elaborated on using the same change models as for the general sample. The three subsamples and their calculation are further described in the results section 6.1.

#### **4.2.2 Required improvement in EVA benchmark**

There are several critical problems with using change models utilising pre-event performance as benchmarks for post-event performance. One of the reasons is the fact that this approach overlooks the economic reasoning that the acquiring company's management gave to its shareholders when deciding to pay a certain premium for the

target (Sirower and O'Byrne, 1998). Intuitively this can be explained as the performance and synergies (simply the required return on the investment) required by the shareholders to gain, over the possibility of individually buying the acquirer's and target's shares and thereby getting exposure to both their future cash flows, while not having to pay any premium above the market price. Essentially, it is a question of justifying the premium paid, with improvements in operating performance. Sirower and O'Byrne (1998) use another intuition for why the comparing pre- and post-event performance is an inappropriate method, in stating that the pre-event stock price already accounts for future expected improvements and that the benchmarking process should deal with these expectations and not attribute them to the performance of the M&A. For example a company with good past performance was expected by the market to perform even better in that particular period and the market therefore reacts by adjusting its future expectations about the company's value with decreasing it, even though there has not been any decrease in operating performance. For an acquiring company, the past performance essentially becomes insignificant while the interest switches to the expectations of future performance of the combined entity.

In contrast with the pre-event performance benchmark, the *required improvements in EVA* benchmarking approach builds upon the very concept of fundamental value and relation between EVA and MVA introduced in Section 4.1. The essential insight of this benchmarking approach, that separates it from other performance measurement methodologies is to isolate the already acknowledged components of market value from the future expected components and thereby isolate the real performance coming from the synergies provided by the transaction (Sirower and O'Byrne, 1998). The basic intuition behind this methodology can be already found in Miller and Modigliani's 1961 paper, where the very basics of fundamental company valuation through the relation between a company's present value of free cash flows and its total market value are presented. However, there are methodological issues with using the FCF concept as an operating performance measure (mainly the subtraction of investments) and these can be avoided with using the EVA metric instead. While the PV of the initial investment is identical for FCF and EVA, the PV of the depreciation and capital charge in EVA is equal to the new investment costs in the FCF (Sirower and O'Byrne, 1998). So, the market value can be expressed in dependence on EVA as:

$$MV = InvestedCapital + PVofFutureEVA$$

From the equation we see that the Market Value, which is equal to the PV of future FCF is also equal to the PV of future EVA and the initial invested capital.

Finding ground in Miller and Modigliani's original valuation model, O'Byrne (1996) show that when transposing and adjusting it we arrive at the following form:

$$MV = X/c + \sum [I(r - c)/c]/(1 + c)^t \quad (4.5)$$

where  $MV$  represents firm's market value,  $X$  is the company's NOPAT,  $c$  is the cost of capital,  $I$  the investment and  $r$  the constant return on the investment  $I$ .

As O'Byrne (1996) and Sirower and O'Byrne (1998) show, from this formula we can separate the market value into the two earlier mentioned elements. The first component, denoted by  $NOPAT/c$  represents the *value of present operations* and represents the present value of the current earnings (on basis of current asset). This is also the "known" part of the performance measure. The second part of the equation denoted by  $\sum [I(r - c)/c]/(1 + c)^t$  stands for the expectations of future growth in the company's value, also called the *future growth value* (FGV).

We can now move on to the kernel of the required improvement benchmarking approach, combining the two earlier described concepts of i) EVA and ii) the market value model, to arrive at:

$$MV_0 = Cap_0 + EVA_0/c + ((1 + c)/c) * \sum_{t=1}^{\infty} \Delta EVA_t / (1 + c)^t \quad (4.6)$$

where,  $MV_0$  represents the market value at the *end* of year 0,  $Cap_0$  is the book value of capital at the end of year 0,  $EVA_0$  is the EVA of year 0,  $c$  is the cost of capital on the basis of WACC<sup>5</sup> and  $\Delta EVA_t$  is markets expectation of the EVA improvements in year  $t$  at the end of year 0.

As we saw from equation 4.5, the market value can be essentially divided into two parts. The same holds for equation 4.6 where  $Cap_0$  and  $EVA/c$  represent the first part, the *value of present operations*. The remaining term in equation 4.6, the *future growth value* (FGV) of the company, is represented by the expected *EVA improvements*.

So far, we have described the market value equation in terms of EVA and its two components. Now we move on to the "required improvement" part of this specific benchmarking approach. As we see the market value consist of two parts, the *value of present operations* and the *FGV*. From finance theory we know, that market participants have expectations on the return of the market value of their investment. This expected return has to be realised on both of the market value components. Again, incorporating the EVA concept, it is only when a company is able to realise EVA improvements that it's NOPAT will provide a cost of capital

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<sup>5</sup>Now we see that:  $EVA_0 = NOPAT_0 - c * Cap_{-1}$  and  $EVA_1 = NOPAT_1 - c * Cap_0$



return over the *current operations*. This is then the return realised on the FGV of the market value equation (Sirower and O'Byrne, 1998). We have already shown that  $EVA_1 = NOPAT_1 - c * Cap_0$ , so when rewriting this formula, we get  $NOPAT_1 = EVA_1 + c * Cap_0$ . If we then assume the case in which a company has no *EVA improvements* then  $EVA_1$  equals  $EVA_0$  and  $NOPAT_1 = EVA_0 + c * Cap_0$ . Rewriting this intuition gives us  $EVA_0 + c * Cap_0 = c * (EVA_0/c + Cap_0)$  and when recalling equation 4.6, we see that this equals the current operations at the end of year 0 times the cost of capital  $c$ . Therefore with a constant EVA (no EVA improvements) the NOPAT produces only a cost of capital return on current operations, but non on the FGV.

So far we have proven, that in order to provide investors with a cost of capital return on the FGV of a company, there has to be an EVA improvement. This cost of capital return on the FGV, has to be provided by the *expected EVA improvement* and/or the change in FGV as shown in:

$$FGV_0 * c = \Delta EVA_1 + \Delta EVA_1/c + \Delta FGV_1 \quad (4.7)$$

Now this provides us with a new variable that we have to account for, the change in FGV. While there is a number of theories and models that try to predict the change in FGV, for this purpose I will stay with the assumption made by O'Byrne (1996) and Sirower and O'Byrne (1998), that the change in FGV is zero. This assumption of  $\Delta FGV_1 = 0$  allows us to rewrite equation 4.7 into the following form:

$$FGV_0 * c = \Delta EVA_1 + \Delta EVA_1/c \quad (4.8)$$

So now we assume that the cost of capital return on the FGV has to be provided the *expected EVA improvement*. We also see, that each dollar of EVA improvement contributes to the value by  $1 + (1/c)$ . In order to provide a return on the FGV of  $FGV_0 * c$  a company has to generate enough expected EVA improvement  $\Delta EVA$  to satisfy:

$$\Delta EVA_1 = FGV_0 * [(c * c)/(1 + c)] \quad (4.9)$$

This is the benchmark performance an M&A has to provide to its shareholders to generate excess EVA improvements.

Moving from the theoretical base to the application, the performance evaluation, utilising the required improvement benchmark methodology can be described in the following seven steps. Steps I-III represent the calculation of the performance benchmark and steps IV-VII show the actual performance evaluation:<sup>6</sup>

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<sup>6</sup>Described by Sirower and O'Byrne (1998)

(i) The basis of this performance analysis is constructing a pro-forma base case for the combined entity (acquirer and target).<sup>7</sup> The *total market capitalisation* of the combined entity (as of five days before the announcement date) is calculated as the sum of the total market capitalisation of the acquirer and the target, including the acquisition premium. Further, the *total capital invested* is calculated (as of the beginning of the year prior the announcement) as the sum of the acquirer's capital and the price paid for the target. Hereby, the premium paid and the newly created goodwill under the purchase accounting rules are incorporated. The current *Net Operating Profit after Taxes* is obtained for both companies and summed to obtain the pro-forma entities NOPAT. Lastly, the cost of capital is calculated for the combined entity as the weighted average of the acquirer's and target's WACC with the weights being the market capitalisation.

(ii) Now, moving back to equation 4.6 and using the values gathered for the pro-forma base of the combined entity, the expectational part (FGV) of the market value is computed. First, the current EVA is calculated using the current NOPAT, the invested capital from the beginning of the previous year and the cost of capital of the combined entity. The resulting current EVA is further capitalised at the cost of capital. By adding the capitalised current value of EVA to the total invested capital, the value of current operations is obtained. The difference between the market capitalisation and the value of current operations gives the present value of expected EVA improvements, which is equal to the companies expected FGV.

(iii) Multiplying the obtained FGV by the cost of capital, the investors expected dollar return on the FGV is obtained. Further, the contribution effect of each dollar of EVA improvements to the value is calculated as  $1 + (1/c)$  (assuming that each dollar of  $\Delta EVA$  is capitalised at its perpetuity value). Finally, to obtain the benchmark EVA improvements that the company needs to earn each year to provide the expected return on the FGV (assuming the FGV is constant), the dollar value of the FGV is divided by the EVA improvement contribution as seen in equation 4.8.

(iv) After obtaining the *benchmark* EVA improvements, the *actual* EVA improvements for the combined entity are calculated for each of the 5 years subsequent to the event.

(v) By subtracting the expected EVA improvements from the actually realised EVA improvements, the *excess* EVA improvements are obtained.

(vi) The excess EVA improvements are discounted by the combined entity's cost of capital and summed. Further, the cumulative present value of the excess EVA improvements is capitalised by  $(1 + c)/c$ , as seen in

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<sup>7</sup>It is a proxy base because the market and capital values are calculated for the combined entity including the acquisition premium, but prior to the announcement date.

equation 4.6. This result stands for the capitalised excess performance relative to the benchmark and represents the excess EVA improvements performance measures.

(vii) Finally, having the capitalised the excess performance, this value can be compared with the abnormal performance (in dollar terms) of the acquiring company as measured by other performance metrics. In the subsequent analysis I will use two market-related measures to compare the results of this approach. The methodology utilised to calculate these performance measures is described further in Section 4.4.

As in the change model analysis described in section 4.2.1, the excess EVA improvement benchmark will be divided into sub-samples according to the earlier stated firm- and deal-characteristics and the differences between the sub-sample's EVAs will be evaluated.

### 4.3 Attribution analysis

In order to get a better understanding about the influence of firm- and deal-specific factors on the post-event performance, an attribution analysis will be conducted. To do so, several linear regressions, using the ordinary least squares method (OLS) will be run on the following general model basis:

$$Y_i = \alpha_i + \beta_1 PRE_i + \beta_2 CH_i + \beta_3 DV_i + \varepsilon_i \quad (4.10)$$

where  $Y_i$  is the dependent performance variable represented by the various EVA post-event performance measures,  $\alpha_i$  represents the models intercept,  $\beta_1$  are the coefficients of the pre-event performance variables  $PRE_i$ ,  $\beta_2$  are the coefficients of the firm- and deal-specific characteristics  $CH_i$  and  $\beta_3$  are the coefficients of the dummy variables  $DV_i$ . The error term is represented by  $\varepsilon_i$ .

The characteristics explanatory variables  $CH_i$  consist of the *relative size* between the target and acquirer, the *acquirer's size* measured by it's market capitalisation, the *deal value* in dollar terms, the *acquirer's BTM ratio* and the dollar value of the *premium paid*. The dummy variables  $DV_i$  correspond with the earlier mentioned binary firm- and deal- characteristics, also examined by the change model model in section 4.2.1 and the excess EVA improvement methodology from 4.2.2 .

### 4.4 Market related measures of performance

In order to compare the results provided by the EVA performance measures, two additional market related measures will be calculated. Firstly, a short-term measure, based on the cumulative abnormal returns (CAR) to reflect the markets initial reaction to the announcement of the event. Secondly, a 5-year market return measure

will be calculated to compare with the EVA measure, since both of these reflect the post-event performance from a long-term perspective. The exact methodologies applied for both market related measures are described further in this section.

### Short-term stock market return

The short-term stock market performance measure is calculated as the *Cumulative Abnormal Return* (CAR) for each acquiring company. First, the daily raw returns of the acquiring companies are adjusted for the benchmark market return<sup>8</sup>. Further, the abnormal returns from 5 days prior until 5 days after the announcement date are summed. This sum of returns is subsequently multiplied by the market price of the acquiring company 6 days prior the announcement date, to arrive at the dollar value of the CAR.

$$CAR_i = \sum_{t=1}^t AR_{i,t} \quad (4.11)$$

where  $CAR_i$  is the CAR for the acquiring firm  $i$ ,  $AR_{i,t}$  is the abnormal return of acquiring company  $i$  on day  $t$  calculated as  $AR_{i,t} = R_{i,t} - E(R_{i,t})$ .

### Long-term stock market return

The long-term stock market performance of the acquiring companies is measured over 5 years following the completion of the transaction using *buy-and-hold abnormal returns* (BHAR) defined as:<sup>9</sup>

$$BHAR_i = \prod_{t=1}^t [1 + R_{it}] - \prod_{t=1}^t [1 + E(R_{it})] \quad (4.12)$$

where  $\prod_{t=1}^{i,t} [1 + R_{it}]$  is the realized return of the acquiring company over the holding period and  $\prod_{t=1}^t [1 + E(R_{it})]$  is the normal buy-and-hold return (of a reference portfolio or asset) over the same period.

The reference returns are calculated using a reference portfolio and a matching firm methodology. Both Barber and Lyon (1997) and Dutta and Jog (2009) suggest using the CRSP equally weighted index<sup>10</sup> as the reference portfolio. However Barber and Lyon (1997) conclude that this benchmarking approach leads to significant misspecification of the performance measure, mainly due to the new listing, the skewness and the rebalancing biases.

<sup>8</sup>The benchmark market return is represented by the CRSP equally weighted index.

<sup>9</sup>As presented by Barber and Lyon (1997).

<sup>10</sup>Consisting of all stocks traded on NYSE/AMEX/NASDAQ

Using the matching firm methodology presented by Loughran and Vijh (1997), the new listing and re-balancing biases can be eliminated. This benchmarking method builds upon Fama and French (1992), adjusting the company's returns for size and book-to-market (BTM) effects using matching firm returns. First, the yearly returns between 2002-2013 for all NYSE/AMEX/NASDAQ stocks are obtained from the CRSP database. Subsequently, the size and book-to-market factors are obtained for these firms from CRSP and COMPUSTAT. The Buy-and-hold returns in each year are regressed on an intercept and the size and book-to-market factors. The resulting regression coefficients are further used to calculate the required return on equity as  $RROE = a + b_0 \times Size + b_1 \times BTM$ . The companies from both the acquiring company sample and the CRSP control firm sample are then ranked each relevant year according to their conditional required return on equity. Finally, for every of the 5 years of the post-event period, each of the acquiring companies is matched with a firm from the CRSP sample with the closest value of RROE and the matched company's buy and hold return over the year is then used as the benchmark for the acquiring company's performance.

Summarising the methodology section, we obtain a set of six post-event performance variables. The three main performance measures are based on the acquiring company's EVA. The first two are calculated using the change model comparing post-event with pre-event performance. The third one is calculated using a value-based benchmark, comparing the required improvements in EVA with the actually obtained improvements. For comparison reasons three additional market related performance measures will be calculated. One short-term (CAR), reflecting the markets initial reaction and two long-term (BHAR), evaluating the acquiring companies long-term performance evolution after such a major strategic M&A event.

## 5 — Data

In this chapter, the sample of M&A transactions further utilised in the empirical framework is described. First, the rationale behind the selection process of the primary M&A dataset is described. Further the data collection and sampling process are described and the respective sample size development presented. In the final part of this chapter the descriptive statistics and major characteristics of the main data are summarised. I carefully applied several major sampling assumptions

### 5.1 Sample rationale

Precisely calculating the EVA measure for a set of companies requires a lot of hand data collection, subjective assumptions and individual calculations. In order to keep these calculations accurate and unbiased I aimed to keep the sample relatively small, but as relevant as possible. Therefore, I adopted some of the specific selection criteria and assumptions applied in earlier studies dealing with similar transaction samples and performance measures (Healy et al., 1992, 1997; Sirower and O'Byrne, 1998; Yook, 2004). First of all, having the most M&A activity and best data availability, I have chosen to study domestic transactions of US acquirers. As suggested by Healy et al. (1992), to retrieve a relevant and manageable sample I specifically aimed for large transactions, as only a small amount of these often represents a major part of the total dollar value of events in a given time period. Another specific criteria that I used when identifying relevant transactions is the proportional size of the target to the acquirer. When the target is relatively larger it signals that the transaction is a truly major and strategic decision with a significant impact on the acquirer's future strategy and performance (Sirower and O'Byrne, 1998).

Since there has been a substantial amount of empirical research on M&A activity in the second half of the 20th century, I chose to focus on more recent deals. Transactions have generally changed in size, volume and characteristics since the earlier merger periods. Therefore, choosing observations from a more recent time-period could also reveal new conclusions about these events. Further, these findings could be compared to findings on earlier transactions. However, as stated previously, generally comparing outcomes from different

studies on post-M&A performance is difficult and can lead to biased or even wrong outcomes and therefore one should be careful when making such statements.

Finally, I decided to chose an observation period between 2002 to 2012. The main reason for the selection of the beginning date was the change in accounting standards, specifically then the end of interest-pooling accounting under the Financial Accounting Standards Board's Statement No. 141 (FASB) from 2001. After 2001, transaction have to be handled using the purchase-accounting method (or a revised version, the acquisition method). The accounting method used in the transaction does influence the calculations of several variables throughout the research methods presented in chapter 4. Therefore, choosing a period of unified accounting standards does reduce the risks of miscalculation and biased results. The end of the observation period was set as of the beginning of 2013 to ensure data availability throughout the 5 years subsequent to the transaction completion.

In line with the sampling approach by Healy et al. (1992, 1997) and Loughran and Vjih (1997), I selected transactions where the acquirer is a listed company and the target is delisted after the event and becomes part of the acquirer. Thereby, the post-event market and operating performance of the combined entity is less distorted by market irrationality and accounting approaches.

## **5.2 Data collection and sampling process**

The primary data source for the transactions sample was the Zephyr database, including information on over 1.7 million transactions. In the first step of the filtering I extracted over 1 million transaction (1) announced, rumoured or completed during 2002-2013. Further, I filtered for (2) US acquirers and US targets involved in (3) domestic transactions, including only (4) mergers and acquisitions. Transactions of (5) financial institutions as well as companies within the industries of transportation, utilities and healthcare were excluded from the sample as these are regulated industries and their comparability with the firms from other industries is limited (Healy et al., 1992). In order to control for sufficient availability of market and accounting data of the transaction participants I filtered for (6) listed only acquirers and targets delisted after the transaction. The deal had to be (7) officially confirmed to be completed. Further, I controlled for criteria supporting the relevance of the transactions, so that the sample con making it a major strategic decision. Consistent with Sirower and O'Byrne (1998) I selected only transactions were the (8) initial stake of the acquirer was no more than 5% and the final stake was at least 90%.

After applying these basic search criteria within the Zephyr database, the sample consisted of 870 transactions. Subsequently, I obtained relevant firm- and deal-specific data for each transaction provided by the Zephyr

database and completed these with accounting data from Thomson Reuters Eikon and COMPUSTAT and market related data from the CRSP database. Using these information I hand-controlled for (9) missing values and information and removed insufficiently descriptive transactions<sup>11</sup> leading to a sample of 258 deals. Using the obtained data on market equity (as of 5 days prior the announcement date) and the book value of debt (as of the last available year prior the announcement date) for both the acquirer and target, I calculated the relative size<sup>12</sup> of the targets to the acquirers. Subsequently, I removed all observations in which (10) the target's relative size was less than 35% of the acquirer's. Since the sample still included several transactions with very small deal size relative to the median value, I further excluded all deals (11) smaller than \$50m. Finally, consistent with (Healy et al., 1992, 1997; Sirower and O'Byrne, 1998) I controlled for (12) repeating M&A activity by removing deals made by acquirers that completed another transaction in a 5 year period subsequent to the deal included in the sample. This was the case for one observation. The final sample consists of 49 transactions. An overview of the steps applied when filtering and adjusting the sample and the resulting sample size are further presented in Table 5.1. The descriptive statistics of the final sample are further described in section 5.3.

**Table 5.1** M&A sample - Sampling procedures

Number	Step	Step result	Search result
<b>Sample selection criteria</b>			
1	Time period	1,019,564	1,019,564
2	Country	424,695	228,269
3	Domestic deals	312,601	168,643
4	Deal type	662,282	69,778
5	Major sectors	1,588,353	61,371
6	Listing status	21,274	1,183
7	Current deal status	1,204,765	952
8	Percentage of stake	521,816	870
<b>Sample adjustment</b>			
9	Adjustment for missing values and information		258
10	Relative size of Acquirer and Target		98
11	Deal size		50
12	Event Uniqueness		49
<b>Final</b>			<b>49</b>

<sup>11</sup>Mainly deals with missing accounting information and deals with extremely small or unknown deal value.

<sup>12</sup>Calculated as the relative size between the target's and acquirer's market capitalisation plus book value of debt.



### 5.3 Sample characteristics

Having obtained the main sample of major strategic M&As, its basic characteristics will be present in this Section. First, looking at the descriptive statistics in Table 5.2 we see that both the acquirer's and target's equity value ranges from around 100 million dollars to around 25 billion dollars. That means that the sample contains micro- to large-cap companies, with the average being a mid-cap sized firm. The mean relative size of the target and the acquirer of 79% suggests that bidding firms, on average target around 20% smaller companies. However, the sample also contains transactions in which the target is larger than the acquirer.

**Table 5.2** Descriptive Statistics

<b>Descriptive Statistics</b>	<b>Mean</b>	<b>SD</b>	<b>Min</b>	<b>Max</b>
Acquirer Equity Value	4 159	5 264	175	25 367
Target Equity Value	3 003	4 674	98	25 519
Relative size	0.79	0.41	0.37	2.42
Deal Size	4 323	6 009	113	29 100
Relative Premium	0.21	0.17	-0.04	0.75
Dollar Premium	811	1 456	-119	6 352

All variables except for the Relative size and premium are presented in millions of dollars. The relative size is calculated as the target's size divided by the acquirer's size (the size is represented by the firms market capitalisation plus its total debt).

The mean relative premium is around 20% of the deal value, but has a rather large range, with the highest observation being 75 percent and the lowest being a negative premium of -4 percent. This discount suggests that the sample contains at least one acquisition where the target company was very poorly performing and therefore such a transaction represents a major step for the acquirer.

## 6 — Results

This chapter presents the results of the empirical analyses utilised to test the earlier stated hypotheses. The results are presented according to the statistical method applied in the same order as in the methodology section. First, the results from the change model are introduced, further the conclusions coming from the "required improvements in EVA" approach are presented. In the third section the implications coming from the attribution analysis are presented. The last section of this chapter elaborates on the dependences and relations between the gathered performance variables.

### 6.1 Change Model

In this section the results from the change model analysis, comparing pre- and post-event performance will be presented. First, the general results will be examined and further the outcomes regarding the specific firm- and deal-characteristics will be presented. Table 6.1 presents the general results obtained for the entire sample.

The EVAs were calculated for each company five years prior and five years after the M&A event, using the methodology presented in section 4.1. Data on the companies' financials were obtained mainly from COMPU-STAT and partly completed with data from the Zephyr database, Thomson Reuters Eikon and CRSP. The US corporate marginal tax rate was utilised to calculate the companies' NOPAT.<sup>13</sup> The cost of capital (WACC) was calculated for each acquirer and target company as of the transaction's year of completion, using the methodology described in section 4.1. The risk-free rate was calculated as the yield on the 10-year Treasury bond in the respective year, obtained from the Federal Reserve database in St. Louis (FRED). Each company's respective industry beta as well as the market risk premium were obtained from prof. Damodaran's database<sup>14</sup>. The credit risk premium was calculated using basis spreads. These were calculated using the sample company's two-year stock return volatility and the basis spread table for the respective year as published by prof. Damodaran<sup>14</sup>. To calculate the after-tax cost of debt, the US corporate marginal tax rate for the respective year was used. The

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<sup>13</sup>Data on the historical US corporate marginal tax rate were obtained from the KPMG tax database, available at: <https://home.kpmg.com/xx/en/home/services/tax/tax-tools-and-resources/tax-rates-online/corporate-tax-rates-table.html>

weights for equity and debt were utilised as industry average values. In the pre-event period, each company's EVA was calculated using its respective cost of capital (for each acquiring and target company separately). To calculate the acquirer's EVA in the post-event period, the cost of capital was utilised as the weighted average of the acquirer's and target's WACC, with the weights being represented by the companies' respective market capitalisation five days prior to the announcement of the event.

To control for industry effects that might have influenced the companies' pre- and post-event performance, the analysis was also performed on industry-adjusted EVAs. These were calculated for each company in the sample using the methodology described in subsection 4.2.1. The industry EVAs and their respective values of invested capital were obtained from the database published by prof. Damodaran<sup>14</sup>.

Panel A shows the acquiring companies' and the pro-forma entities' median EVA (non-adjusted and industry-adjusted) in each of the five years prior to the event and an composite median for the whole period in the last row<sup>15</sup>. In the pre-event period the sample's median non-adjusted EVA was slightly negative with a value of -6 million dollars. Around half of the pro-forma entities had a negative median EVA in this period. However, it is important to point out that the acquiring companies' median EVAs are positive in almost every year and that this negative pre-event performance (of the pro-forma combined entities) is mainly driven by the targets' EVAs. There are several reasons for bidders to acquire underperforming targets. Firstly, the acquiring company's management will likely restructure the target company and utilise its essential assets in a better way to realise synergies and increase the performance of the new combined entity. Secondly, the poor performance of the target makes it a more attractive bid, as the price will likely be lower than that of a well performing company with a similar set of assets.

The observed negative pattern in the pre-event performance is even more pronounced in the industry-adjusted EVAs with a median of -35.9 million dollars. Furthermore, we see that more than two-thirds of the 49 pro-forma entities have a negative EVA. This implies that the sample companies actually underperformed their industry peers prior to the acquisition. As Mitchell and Mulherin (1996) point out, mergers are usually clustered within highly profitable industries. Therefore the relative underperformance of the bidders relative to their industry peers might be caused by the industries extreme performance before the event. The bidder might also approach the respective acquisition in order to strengthen its position (and performance) within the industry or, conversely, diversify its business.

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<sup>14</sup>Data available at: [http://pages.stern.nyu.edu/~adamodar/New\\_Home\\_Page/dataarchived.html](http://pages.stern.nyu.edu/~adamodar/New_Home_Page/dataarchived.html)

<sup>15</sup>To calculate the composite median (Median from years -5 to -1), I utilised the methodology presented by Yook (2004). First, the median EVA (of the five year period) for each company was calculated. The composite median represents the median value from these EVAs. The composite median in the post-event period was calculated in the same way.

**Table 6.1** Change Model I: Non-adjusted and Industry-adjusted EVA

<b>Panel A: Pre-Event Performance</b>						
Year Relative to the Event	Acquirer		Non-adjusted		Industry Adjusted	
	#Negative	EVA	#Negative	EVA	#Negative	EVA
-5	25	-0.7	35	-5.6	36	-39.0
-4	24	0.4	34	-7.1	37	-95.3
-3	21	8.9	32	-4.4	36	-38.0
-2	22	2.7	29	2.0	33	-52.4
-1	21	2.9	35	-10.8	34	-51.4
Median from -5 to -1	22	1.8	26	-6.0	36	-35.9

  

<b>Panel B: Post-Event Performance</b>				
Year Relative to the Event	Non-adjusted		Industry Adjusted	
	#Negative	EVA	#Negative	EVA
1	34	-13.5	38	-111.2
2	41	-38.5	41	-174.8
3	41	-51.8	43	-219.8
4	41	-33.7	40	-133.9
5	38	-26.9	42	-101.1
Median from 1 to 5	34	-40.4	43	-156.5

  

<b>Panel C: Difference between Pre-Event and Post-Event EVA</b>				
Year Relative to the Event	Non-adjusted		Industry Adjusted	
	#Negative	EVA	#Negative	EVA
From (-5, -1) to 1	30	-27.7	31	-23.5
From (-5, -1) to 2	34	-61.5**	37	-134.6***
From (-5, -1) to 3	36	-77.2***	37	-130.5***
From (-5, -1) to 4	29	-21.1*	35	-129.1***
From (-5, -1) to 5	30	-34.4*	31	-62.4**
From (-5, -1) to (1, 5)	30	-32.0**	38	-99.0***

All EVA values are presented in millions of dollars. The Industry-adjusted EVAs are calculated using the methodology described in section 4.2.1. The #Negative columns present the number of observations in the sample with negative EVA in the respective year (the whole sample consists of 49 observations). Panel A shows the median EVA of the combined pro-forma entities for each of the observed years in the pre-event period. The pro-forma entities EVA were calculated as the sum of the acquirer's and target's EVA. Panel B shows the acquiring companies median EVA for each of the observed years in the post-event period. Panel C presents the post-event performance in each of the observed years relative to the median pre-event EVA (median from -5 to -1). In order to test the statistical significance of the differences a non-parametric Wilcoxon signed-rank test was performed. The levels of significance are denoted as: \* for  $p < 0.10$ , \*\* for  $p < 0.05$  and \*\*\* for  $p < 0.01$ .

Panel B presents the post-event median EVA for each year relative to the event as well as the post-event composite median. From the non-adjusted EVAs we see that the sample companies' performance decreases immediately after the event from -10.8 million in the last year prior to the transaction to -13.5 million in the first year of the post-event period. The performance continues to further decrease to -51.8 million in the third post-event year. Thereafter, the median EVA starts to slightly improve again to -26.9 million in the fifth year after the event. This reverting pattern might be attributed to the integration process in which companies need time to fully realise the synergistic gains. The composite median performance then, is a negative -40.4 million dollars. Looking at the industry-adjusted EVA values, we see that the negative effect becomes even more pronounced with the EVA dropping from -51.4 million in the last pre-event year to -111.2 million in the first post-event year. As with the non-adjusted EVA, we again observe a further performance decrease to -219.8 million in the third post-event year and afterwards a sharp improvement to -101.1 million in the last year. The observed reverting pattern of performance might be an indicator of the five year post-event period being too short to measure the actual synergistic gains from the acquisition. The number of companies with negative EVA also increases in the post-event period relative to the pre-event period, for both measures.

Panel C shows the differences between the pre-event composite median EVA and the median EVAs in each of the subsequent post-event years<sup>16</sup>. The results show significantly negative post-event performance relative to the pre-event benchmark in each of the 5 years after the M&A event. This holds true for both, the non-adjusted and industry-adjusted EVAs. The last row in Panel C presents the difference through the whole 10-year observation period. Again, around two-thirds of the companies show negative EVA values. The median difference of the non-adjusted EVA is a negative -32 million dollars. The results of the Industry-adjusted EVA show an even more significant underperformance in the post-event period with a composite median of -99 million dollars. The resulting differences are statistically significant for each year except the first one and also for the composite median differences.

Overall then these results show that major strategic M&As fail to provide the needed synergies and thereby significantly deteriorate the acquiring company's value, as the post-event operating performance is not able to cover the required return on the increased invested capital. The results hold statistically significant for both, the non-adjusted and industry-adjusted EVAs and therefore I confirm the acceptance of hypothesis H1.1. These results are in-line with the findings made by Yook (2004), who also found negative values in the difference between pre- and post-event performance.

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<sup>16</sup>These are calculated for each firm separately as the company's EVA in the relative post-event year minus the pre-event median EVA (Median from -5 to -1). The displayed aggregated EVA is then represented by the median of the differences in each respective period.

## Method of Payment

In order to investigate the hypothesis of cash financed transactions outperforming stock financed deals, I divided the sample according to this deal characteristic (the resulting sub-samples consist of 29 cash financed and 20 stock financed transactions). Table 6.2 shows the resulting EVAs for stock and cash financed transaction and the difference between these in each of the observed years (periods).

The results from the pre-event period in Panel A show that cash-bidders outperform stock-bidders measured by the Non-adjusted EVA by a median of 6.2 million. The difference is however significant only in the second pre-event year and so no empirical conclusion can be drawn from these results. When adjusting the EVAs for industry effects, we see the opposite with stock acquirers actually underperforming less than cash acquirers, by a median of 15.3 million. However non of the differences is statistically significant and therefore their are not distinguishable from zero.

From Panel B we see that the median EVAs decrease again rapidly in the post-event period in both subsamples, with cash-deals outperforming stock deals in almost every post event year. Through the whole post-event period cash deals outperform stock deals by 1.2 million and 44.6 million respectively. Cash financed deals seem to better improve their performance in the later years of the post-event period measured by both non-adjusted and industry-adjusted EVAs. This implies that acquirers paying with cash for their targets seem to be better at obtaining the synergies and recovering their operating performance after the event. However, as with the pre-event performance results, non of the differences is statistically significant and therefore, no general conclusion can be made.

The results in Panel C again confirm the negative difference between pre- and post-event performance for both subsamples, with the aggregated median non-adjusted EVA values being -0.5 and -59.4. These differences actually suggest stock financed deals outperforming cash financed deals due to their worse performance in the pre-event period. The differences between the pre- and post-event performance as well as the differences between stock and cash deals lack statistical significance. Therefore no conclusion can be drawn from these results regarding this deal characteristic.

The differences between pre- and post-event industry-adjusted operating performance show a significant underperformance of both groups, with values of -112.7 and -99 million. As before, we see cash deals underperforming less than stock deals. These findings support the general results found by scholars (Loughran and Vijh, 1997; Healy et al., 1997; Tuch and O'Sullivan, 2007), that stock acquirers are generally overvalued in the pre-event period and do on average lose more in the post-event period than cash acquirers. The differences between stock and cash financed transaction are however again not distinguishable from zero. As the presented

**Table 6.2** Change Model II: Method of payment

<b>Panel A: Pre-Event Performance</b>						
Year Relative to the Event	Non-adjusted EVA			Industry-adjusted EVA		
	Stock	Cash	Difference	Stock	Cash	Difference
-5	-7.1	-3.9	3.2	-26.8	-69.2	-42.4
-4	-4.2	-7.6	-3.4	-18.2	-118.8	-100.7
-3	-7.1	1.6	8.8	-37.5	-41.4	-3.9
-2	-3.6	9.5	13.0*	-60.5	-45.2	15.3
-1	-15.7	-5.9	9.8	-58.2	-40.4	17.8
Median from -5 to -1	-6.1	0.1	6.2	-25.0	-40.4	-15.3
<b>Panel B: Post-Event Performance</b>						
Year Relative to the Event	Non-adjusted EVA			Industry-adjusted EVA		
	Stock	Cash	Difference	Stock	Cash	Difference
1	-24.6	-12.8	11.8	-56.2	-156.6	-100.4
2	-51.9	-25.6	26.3	-158.1	-179.4	-21.3
3	-82.2	-46.8	35.4	-369.4	-215.3	154.1
4	-46.6	-33.7	12.9	-201.1	-133.9	67.2
5	-56.6	-16.2	40.4	-138.7	-101.1	37.7
Median from 1 to 5	-41.7	-40.4	1.2	-201.1	-156.5	44.6
<b>Panel C: Difference between Pre-Event and Post-Event EVA</b>						
Year Relative to the Event	Non-adjusted EVA			Industry-adjusted EVA		
	Stock	Cash	Difference	Stock	Cash	Difference
From (-5, -1) to 1	-15.4	-31.1	-15.8	-20.0	-95.7	-75.6
From (-5, -1) to 2	-5.4	-62.4	-57.0	-152.0*	-103.9***	48.1
From (-5, -1) to 3	-51.3	-77.2	-25.9	-200.1**	-113.6**	86.5
From (-5, -1) to 4	-8.1	-26.2**	-18.2	-112.7*	-137.7**	-25.0
From (-5, -1) to 5	-63.1	-31.6	31.5	-163.5*	-41.1	122.4
From (-5, -1) to (1, 5)	-0.5	-59.4	-58.9	-112.7**	-99.0**	13.6

All EVA values are presented in millions of dollars. The Industry-adjusted EVAs are calculated using the methodology described in section 4.2.1. Panel A shows the median EVA of the combined pro-forma entities for each of the observed years in the pre-event period. The pro-forma entities EVA were calculated as the sum of the acquirer's and target's EVA. Panel B shows the acquiring companies median EVA for each of the observed years in the post-event period. Panel C presents the post-event performance in each of the observed years relative to the median pre-event EVA (median from -5 to -1). In order to test the statistical significance of the differences a non-parametric Wilcoxon signed-rank test was performed. The levels of significance are denoted as: \* for  $p < 0.10$ , \*\* for  $p < 0.05$  and \*\*\* for  $p < 0.01$ .

results on the method of payment are of mixed character and lack statistical significance, I reject the related hypothesis H2.1.

### **Business relatedness**

As presented in the literature review in section 2, industry similarity can be a very predicting factor in the post-M&A performance puzzle. From the empirical conclusions it seems that higher business overlap is associated with better performance, since companies operating in similar industries are generally better at retrieving the promised synergistic gains (Healy et al., 1997; Bruner, 2002). To investigate the earlier stated hypothesis of related transactions outperforming diversifying transactions, I created an business overlap variable. Park (2002) point out in their research, that business relatedness and the possible synergies are not necessarily represented by an overlap of the companies' general industries, but rather by their ability to utilise the target's essential resources and capabilities. In order to fully reflect such synergistic possibilities, one would need to investigate each company's operating assets and business processes in close detail. As this would have generally been a too wide analysis for this purpose, I at least focused not only on the acquiring and target company's main industries, but also on their sub industries in which they are classified according to their SIC codes. Depending on the acquiring and target company's three-digit SIC codes I divided the sample into transactions with low and high business similarity (the sub-samples include 34 related and 15 diversifying transactions). Table 6.3 presents the EVAs of each sub-sample and their respective differences.

From the results in Panel A we see that the non-adjusted EVA suggest companies engaging in related transactions (high business overlap) to perform better in the pre-event period by a significant median difference of 39.4 million. The industry-adjusted EVAs on the other hand point in the opposite direction with a median difference of -12.7 million. This difference is however not statistically significant.

The post-event performance presented in Panel B shows that the high overlapping companies do perform better in the first years after the transaction, but that after the third post-event year this pattern reverts. The median for the whole period of -4.7 million is also favouring the diversifying transactions. When industry-effects are taken into account, low overlapping transaction outperform focusing deals in every post-event year with a composite median of -59.2 million. The same holds true for the resulting pre- and post-event differences in Panel C. Both EVA measures point in the direction of diversifying transactions actually underperforming less than focusing deals relative to their pre-event benchmark performances. Even though these results oppose the general research conclusions made by scholars , neither of them can be statistically distinguished from zero.

The non-adjusted and industry-adjusted aggregated EVA differences both point in the opposite direction than suggested by hypothesis H2.2. Namely, that acquirers with higher business overlap actually underperform



**Table 6.3** Change model III: Business relatedness

<b>Panel A: Pre-Event Performance</b>						
Year Relative to the Event	Non-adjusted EVA			Industry-adjusted EVA		
	Low	High	Difference	Low	High	Difference
-5	-11.6	-2.3	9.3	-66.4	-33.4	33.0
-4	-14.4	-5.5	8.9	-16.5	-116.0	-99.5
-3	-17.3	10.8	28.1	-37.0	-39.7	-2.7
-2	-12.1	26.4	38.5	-121.4	-39.6	81.8
-1	-18.7	3.8	22.6*	-40.4	-53.1	-12.7
Median from -5 to -1	-18.7	20.7	39.4*	-26.9	-39.6	-12.7
<b>Panel B: Post-Event Performance</b>						
Year Relative to the Event	Non-adjusted EVA			Industry-adjusted EVA		
	Low	High	Difference	Low	High	Difference
1	-30.5	-5.6	24.9	-67.7	-122.3	-54.7
2	-42.5	-24.2	18.3	-174.8	-177.1	-2.3
3	-44.4	-84.4	-40.0	-80.7	-280.8	-200.0
4	-33.7	-38.2	-4.5	-64.5	-205.6	-141.1
5	-13.1	-46.6	-33.5	-53.5	-118.5	-65.1
Median from 1 to 5	-38.9	-43.6	-4.7	-108.8	-168.0	-59.2
<b>Panel C: Difference between Pre-Event and Post-Event EVA</b>						
Year Relative to the Event	Non-adjusted EVA			Industry-adjusted EVA		
	Low	High	Difference	Low	High	Difference
From (-5, -1) to 1	-14.9	-31.6	-16.7	-9.6	-39.7	-30.1
From (-5, -1) to 2	-30.4	-61.9**	-31.6	-134.6**	-123.6***	11.0
From (-5, -1) to 3	-40.4	-102.7**	-62.2	-68.2*	-137.3***	-69.1
From (-5, -1) to 4	-21.1	-17.8	3.4	-6.7	-135.8**	-129.1
From (-5, -1) to 5	-11.5	-63.1	-51.6	4.7	-80.7**	-85.4
From (-5, -1) to (1, 5)	-32.0	-36.4*	-4.4	-96.2*	-101.5***	-5.2

All EVA values are presented in millions of dollars. The Industry-adjusted EVAs are calculated using the methodology described in section 4.2.1. Panel A shows the median EVA of the combined pro-forma entities for each of the observed years in the pre-event period. The pro-forma entities EVA were calculated as the sum of the acquirer's and target's EVA. Panel B shows the acquiring companies median EVA for each of the observed years in the post-event period. Panel C presents the post-event performance in each of the observed years relative to the median pre-event EVA (median from -5 to -1). In order to test the statistical significance of the differences a non-parametric Wilcoxon signed-rank test was performed. The levels of significance are denoted as: \* for  $p < 0.10$ , \*\* for  $p < 0.05$  and \*\*\* for  $p < 0.01$ .

bidders acquiring target's with less business commonality. The differences are however statistically insignificant. Overall again, there cannot be drawn any univariate conclusion other than M&As having a negative performance effect on both the sub-groups. For these reasons I reject hypothesis H2.2.

### **Premium Paid**

The premium an acquiring company is willing to pay for a target reveals its perception of future synergies and increase in fundamental value. The higher the premium paid for the target, the higher the expectations in performance improvements after the transaction. Therefore this measure should be a direct indicator of the post-event performance.

As the premium paid for the target is not represented by a binary variable I have adopted the approach by Yook (2004), dividing the sample transactions into a low and high premium category depending on whether the percent premium paid above the target's market price fell short or exceeded the median percent premium of the transaction sample. The EVAs of the resulting sub-samples as well as their respective differences are presented in Table 6.4.

From the pre-event EVAs shown in Panel A it seems that companies involved in high premium deals generally outperform companies paying low premiums with insignificant composite median differences of 2.0 million and 29.7 million after adjusting for industry effects. Measured by the Non-adjusted median EVA, high premium deals outperform low premium deals in every of the post event years and throughout the whole period, by a median value of 44.1 million. Moreover, deals in which the premium paid for the target was higher than the samples median show an almost positive EVA in the fifth year after the event. When adjusting the performance measure for industry effects, high premium deals outperform low premium deals only after the third post-event year, but also through the whole five year period. Both measures indicate that the high premium deals realise steep performance improvements after the third post-event year. Again, only one of the differences between the performance of the low and high premium subsamples is statistically different from zero on a 10% confidence level. Therefore, no conclusions can be drawn from these values.

Even though the acquirers still underperform relative to their pre-event performance benchmarks, a clear improvement trend can be identified from the results in Panel C. Higher premiums paid for targets within major strategic M&As seem to be justified by the post-event performance, especially in later years of the post-event period. A possible explanation of this pattern could be provided by the general reason for the low-premium transactions. If the target's shareholders are willing to sell their stakes at a low or even negative premium it implies that the target company does not perform well at the current moment or is not in possession of any major future growth options. Such a company is in need of restructuring and the acquirer bears more uncertainty

**Table 6.4** Change Model IV: Premium paid

<b>Panel A: Pre-Event Performance</b>						
Year Relative to the Event	Non-adjusted EVA			Industry-adjusted EVA		
	Low	High	Difference	Low	High	Difference
-5	-3.9	-7.1	-3.2	-27.8	-47.7	-19.9
-4	-7.6	-6.0	1.6	-95.3	-74.3	21.0
-3	-9.3	-0.3	9.0	-52.7	-35.1	17.6
-2	1.4	6.8	5.4	-63.6	-39.6	24.0
-1	-10.8	0.5	11.3	-40.4	-56.6	-16.2
Median from -5 to -1	-6.2	-4.1	2.0	-54.7	-25.0	29.7
<b>Panel B: Post-Event Performance</b>						
Year Relative to the Event	Non-adjusted EVA			Industry-adjusted EVA		
	Low	High	Difference	Low	High	Difference
1	-33.8	1.5	35.4	-105.3	-135.4	-30.1
2	-60.3	-20.3	39.9	-174.8	-211.0	-36.2
3	-101.9	-32.5	69.4	-215.3	-399.5	-184.2
4	-57.1	-17.9	39.2	-246.0	-63.6	182.4
5	-65.8	-0.6	65.2*	-209.2	-63.5	145.7
Median from 1 to 5	-66.8	-22.7	44.1	-179.4	-117.8	61.6
<b>Panel C: Difference between Pre-Event and Post-Event EVA</b>						
Year Relative to the Event	Non-adjusted EVA			Industry-adjusted EVA		
	Low	High	Difference	Low	High	Difference
From (-5, -1) to 1	-32.1	0.5	32.6	-9.6	-48.1	-38.5
From (-5, -1) to 2	-68.7*	-26.5	42.2	-103.9*	-222.8***	-119.0
From (-5, -1) to 3	-78.9**	-73.4*	5.5	-113.6*	-344.9***	-231.3
From (-5, -1) to 4	-45.0	-8.5	36.5	-137.7**	-57.1*	80.6
From (-5, -1) to 5	-96.2*	10.3	106.5	-146.9**	-29.0	118.0
From (-5, -1) to (1, 5)	-77.2	-9.3	67.9	-118.1**	-70.8**	47.4

All EVA values are presented in millions of dollars. The Industry-adjusted EVAs are calculated using the methodology described in section 4.2.1. Panel A shows the median EVA of the combined pro-forma entities for each of the observed years in the pre-event period. The pro-forma entities EVA were calculated as the sum of the acquirer's and target's EVA. Panel B shows the acquiring companies median EVA for each of the observed years in the post-event period. Panel C presents the post-event performance in each of the observed years relative to the median pre-event EVA (median from -5 to -1). In order to test the statistical significance of the differences a non-parametric Wilcoxon signed-rank test was performed. The levels of significance are denoted as: \* for  $p < 0.10$ , \*\* for  $p < 0.05$  and \*\*\* for  $p < 0.01$ .

about the possible future synergistic gains. So, the post-event negative performance could either be related to the acquiring firm not being able to recover the potential value from the target or the five year post-event period being too short to capture the synergistic effects as the restructuring process might take longer.

Generally, we have seen that acquirer's paying higher premiums for their targets do outperform low premium bidders. These results are in line with the assumptions made in hypothesis H2.3. However, the resulting differences lacked statistical significance. Hence, the stated hypothesis cannot be confirmed.

## **6.2 EVA Improvement Benchmark**

As discussed in the methodology, in Subsection 4.2.2, utilising a change model comparing pre- and post- event performance bears significant methodological problems and might lead to biased outcomes. To assess the performance evaluation from a more fundamental point of view I utilised the specific methodology introduced in Subsection 4.2.2 and calculated the capitalised PV of excess EVA improvements for each deal. This method uses a value-based performance benchmark, comparing the improvements in EVA required to justify the transaction with the actual EVA improvements generated during the observed five year post-event period.

Table 6.5 provides a consolidated overview of the key variables used to obtain the resulting capitalised PV of excess EVA improvements (in median values). First the benchmark, represented by the median required improvement in EVA is shown. These 7.2 million represent the improvements in EVA that the median company should generate in each of the years subsequent to the transaction to justify the price (including the premium) paid for the target. Further, the median actual improvements in the companies' EVA are shown. We see that in the first year after the transaction the change in EVA is slightly negative, but it becomes positive in the second and third post-event year. For the last two years of the observed period, the improvements in EVA are around zero. The excess EVA improvements represent the median company's actual improvements in EVA less its required benchmark improvements. These are further discounted by the cost of capital to obtain their present values. Next the median sum of the EVA improvements is shown and finally its capitalised value is presented. These -162.7 million dollars represent the median performance of the sample transactions.

As we have seen, the median EVA improvements obtained by the sample companies after the transaction do fall short of their required improvement benchmark. Therefore, it can be concluded that these corporate events do not provide enough synergistic gains to justify the price paid for the target company. The negative excess EVA improvements are caused by two different reasons. Firstly, from the obtained results we see that actually only around half of the companies realise positive EVA improvements after the transaction. Therefore, some of the sample's acquirers do not only underperform their required benchmark, but do not improve their

operating performance at all. Secondly, as suggested before, the integration process could be of longer duration than the observed five year period. Companies would need a longer time period to fully realise the performance improvements from the generated synergies.

**Table 6.5** EVA Improvement

<b>Median Values</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
Required EVA Improvement	7.2				
Actual EVA Improvement	-4.2	39.2	2.5	-0.4	-0.9
Excess EVA Improvement	-18.8	30.3	-3.0	-13.7	-13.0
PV of Excess EVA Improvement	-17.3	26.6	-2.3	-10.5	-8.5
Cumulative	-12.2				
Capitalised PV of Excess EVA Improvements	<b>-162.7</b>				

All values are represented by the sample's median of the respective variable. All values are presented in millions of dollars. Actual EVA Improvement represents the change in EVA in the respective year and the year before. the Excess EVA Improvements are obtained by subtracting the company's required EVA improvement from its actual EVA improvements in each respective year. The present values are obtained by discounting the values using the cost of capital in the form of the WACC calculated for the base pro-forma year. The Capitalised PV of Excess EVA Improvements is obtained by multiplying the cumulative PV of Excess EVA Improvement by the capitalisation factor of  $1/(1 + WACC)$ .

The subsequent part of this subsection elaborates on the effects the previously stated three firm- and deal-characteristics have on the EVA performance measure. To put the results from the excess EVA improvement measure into a wider perspective, two additional market related performance measures were calculated. Firstly the acquirer's 10-day cumulative abnormal return (CAR), reflecting the market's short-term reaction to the announcement of the event. The second one then reflects the long-term buy-and-hold abnormal returns the acquirers (new combined entity) gain over the five year post-event period. Both these measures were calculated using the methodology presented in section 4.4. The median performances for each sub-sample as well as their respective differences are presented in Table 6.6. For further comparability of the excess EVA improvement measure this table also contains the composite median EVA differences obtained by the change models earlier presented in section 6.1.

From the results we see that the EVA measure does suggest an outperformance of cash acquirers to stock acquirers which corresponds with the general empirical literature's results. However both of these groups do generate negative excess EVA improvements. Companies with high business overlap do strongly underperform their diversifying counterparts. A possible explanation of this effect can be high competitiveness within the given industry which is the reason for consolidation. Further than this causes decreasing performance of the industry's constituents in the post-event period. Given the specific methodology applied, this effect can be in-

creased by the high EVA improvement expectations in the pro-forma base year, which are then causing strongly negative excess EVA improvements in the subsequent post-event years. The biggest discrepancy in performance can be seen between the two sub-samples regarding the premium paid for the target. As also concluded in the previous section, high premium deals seem to strongly outperform their low premium counterparts. As the premium paid for the target is included in the company's base pro-forma year's invested capital as well as new market capitalisation it has an essential impact on the excess EVA improvement calculation. Interestingly, we see that high premium deals are in-fact able to produce positive excess EVA improvements. Hence, we can conclude that acquirers paying higher than median premiums for their targets are able to justify their decision with the post-event performance improvements and for them, these corporate events represent positive value creating decisions.

**Table 6.6** Deal-Characteristics

<b>Panel A: Method of Payment</b>					
	EVA_IMP	CAR_ACQ	BHAR_MFM	NA_EVA_CH	IA_EVA_CH
Stock	-191.0	-27.0	-333.0	-0.5	-112.7
Cash	-162.7	-71.1	-137.0	-59.4	-99.0
Difference	28.4	-44.1	196.0	-58.9	13.6
<b>Panel B: Business overlap</b>					
	EVA_IMP	CAR_ACQ	BHAR_MFM	NA_EVA_CH	IA_EVA_CH
Low	-63.7	-53.0	-87.2	-32.0	-96.2
High	-366.2	-29.6	-545.7	-36.4	-101.5
Difference	-302.4	23.5	-458.6	-4.4	-5.2
<b>Panel C: Premium paid</b>					
	EVA_IMP	CAR_ACQ	BHAR_MFM	NA_EVA_CH	IA_EVA_CH
Low	-530.9	-51.9	-20.4	-77.2	-118.1
High	6.0	-21.4	-434.6	-9.3	-70.8
Difference	537.0	30.5	-414.2	67.9	47.4

All variables are presented in median value terms and in millions of dollars. EVA\_IMP refers to the Capitalised PV of excess EVA improvements calculated by the methodology presented in section 4.2.2. CAR\_ACQ is the acquiring companies 10-day abnormal return around the announcement date of the M&A. BHAR\_MFM represents the Buy-and-Hold Abnormal Returns over the five year post-event period calculated using the matching firm methodology presented in section 4.4. NA\_EVA\_CH refers to the median difference in performance obtained by the non-adjusted EVA and IA\_EVA\_CH to the median difference in performance obtained by the industry-adjusted EVA. Both calculated in section 6.1.

The EVA improvement measure does show similar results to the ones obtained by the change models regarding the deal characteristics. All but one of the differences in the non-adjusted EVA change measure show the same conclusions about the performance of the deal-characteristic sub-samples. All of the difference measured by the industry-adjusted EVA do support the results obtained by the excess EVA improvement measure. The improvement measure however, suggests higher magnitudes in the differences. These discrepancies in

size of the difference could be attributed to the industry effects that are corrected for in the industry-adjusted EVA. There are almost no similarities between the results of the EVA measures and the market based performance measures regarding the evaluated characteristics. This finding partially contradicts the conclusion made by Sirower and O'Byrne (1998) who found strong relations between the excess EVA improvements and the market performance measures. However it is important to point out, that non of the presented differences were statistically significant, meaning that the results are statistically not distinguishable from zero and so again no empirical conclusions could be drawn from these results. The different results as well as statistical insignificance are likely to be attributed to the small sample size and the accompanying distribution problems.

As suggested by hypothesis H1.1B, the bidding company's median EVA improvements in the post-event period are not exceeding the required benchmark. Acquirers are not able to create enough value to justify these corporate events. Together with the similar results obtained by the change model in section 6.1 we can accept hypothesis H1.1A and H1.1B, regarding M&As being destroying events for the bidding firm's value. However, non of the hypothesis regarding the firm- and deal-specific characteristics (H2.1, H2.2 and H2.3) could be accepted due to mixed results and lack of statistical significance.

### **6.3 Attribution analysis**

To further investigate the effects of firm- and deal-specific characteristics on the companies' pre-event performance I conducted regression analysis. For each of the three EVA performance measures introduced in the previous sections, three linear regression models were run. The first investigates the effect of the pre-event performance and several firm- and deal-specific characteristics on the post-event performance. The second uses the pre-event performance and three dummy variables corresponding with the earlier investigated factors (method of payment, business overlap and premium paid). The last model combines the previous two. To control for the assumed heteroscedasticity in the data, standard errors were controlled for robustness using the HC1 method. The utilised explanatory variables as well as the resulting regression coefficients are presented in Table 6.7.

*Constant.* The model's constant or intercept represents the value of the dependent variable in case that all of the independent variables are set to zero. In this case than, the constant represents the part of the post-event performance (EVA) that cannot be explained by any of the independent variables applied in the regression model. However, as we see in Table 6.7, except for one model, all constants are statistically insignificant. This suggests that the post-event performance is driven by some of the explanatory variables or an unobserved factor.

*Pre-event Performance.* Mergers tend to gather within industries experiencing highly positive performance in the pre-event period. Also the specific acquirers usually such corporate action after a profitable period. Ac-

According to several empirical studies including Ravenscraft and Scherer (1989), Healy et al. (1992) and Andrade et al. (2001), the pre-event performance is a strong predictor of the post-M&A performance. To test this assumption I have utilised the pre-event explanatory variable as the non-adjusted pre-event EVA and the industry-adjusted pre-event EVA depending on the performance variable examined. From the results we see, that when the non-adjusted EVA is explained, the pre-event performance is not significant. For the other two dependent variables it is significant in almost every model. However, the observed effect is of mixed character which can be attributed to the specific measures. In the models explaining the non-adjusted post-event EVA, the coefficients lack statistical significance. When adjusting for industry effects, the pre-event performance coefficient become significant predictors of the post-event performance. It therefore seems, that better performing companies are also more efficient in integrating the target and generating new synergistic gains after the M&A event. On the other hand, when looking at the excess EVA improvements models, the pre-event performance variable suggests a negative relation with the post-event performance. From the specific methodology (presented in Subsection 4.2.2) we know, that companies with better pre-event performance are required to generate even better EVA improvements after the transaction. The results suggest that they fall short to provide the required amount of performance improvements to justify the price paid for the transaction. So, even though it is true that acquirers with better pre-event performance do also perform better after the transaction, their performance improvements relative to the required benchmark are in-fact worse than those of relatively worse performing (pre-event) acquirers.

*Size effects.* To investigate the effects of size on the post-event performance, I have utilised two different explanatory variables. Size denoted as the acquirer's market capitalisation before the announcement of the deal (*Acquirer's size*) and the relative size between the acquirer and target companies (*Relative Size*). Starting with the absolute size factor, we see that the acquirer's pre-event size does actually have a significantly negative effect on the post-event performance with coefficients ranging from -0.17 to -0.24 for each dollar of the acquirer's market capitalisation (for the Non-adjusted and Industry-adjusted EVA measures). The negative effect of absolute size becomes even more pronounced in the excess EVA improvements measure, where each of the company's dollar of market capitalisation represents a negative value in excess EVA improvements of -1.68 dollars, after the transaction. This negative effect can be attributed to the fact that it is more difficult for larger companies involved in major strategic transactions to realise the needed synergies to improve their post-event performance. The relative size variable shows mixed results, but is not significant in any of the observed models. It is important to note, that the value is already biased, since only transactions with a relative size of 35% and more, were chosen in the sample. Therefore, the explanatory power of this variable is limited.



**Table 6.7** Regression

<b>Regression Model</b>									
<i>Dependent variable</i>	Non-adjusted Post-event EVA			Industry-adjusted Post-event EVA			Capitalised PV of excess EVA improvements		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Constant	\$149.54	-\$83.16	\$119.46	\$105.96	-\$405.08*	-\$139.90	\$1 980.87	-\$516.79	\$2 337.32
Non-adjusted Pre-event EVA	0.32	0.07	0.27				-4.96*	-8.86*	-5.63*
Industry-adjusted Pre-event EVA				1.43**	1.10	1.50***			
<i>Firm- &amp; Deal-characteristics</i>									
Relative Size	-\$113.56		-\$96.01	\$243.01		\$40.41	\$38.27		-\$389.41
Acquirer's Size	-0.17*		-0.17*	-0.22***		-0.24***	-1.68*		-1.68*
Deal Value	0.17		0.16*	0.05		0.12***	0.86		1.40
Acquirer's BTM	-\$152.18		-\$132.06	-\$235.78		-\$67.58	-\$2 472.6*		-\$2 477.27
\$Premium	-0.05			0.23			2.47		
<i>Dummy variables</i>									
Stock Dummy		-\$159.50	-\$125.70		\$165.74	\$443.09**		-\$1 816.64	-\$1 625.96
Hight Overlap Dummy		\$106.22	\$100.13		-\$266.21	\$58.35		-\$474.82	-\$584.44
Premium Dummy		\$51.83	\$9.13		\$105.51	-\$121.91		\$1 507.07	\$1 523.42
<i>Coefficient of determination (R2)</i>	0.37	0.02	0.38	0.66	0.21	0.69	0.40	0.10	0.40

This table presents the coefficients resulting from the linear regressions described in methodology presented in Section 4.3. The earlier presented EVA performance measures were used as dependent variables. In order to control for the assumed heteroscedasticity in the data, standard errors were controlled for robustness using the HC1 method. The levels of significance are denoted as: \* for  $p < 0.10$ , \*\* for  $p < 0.05$  and \*\*\* for  $p < 0.01$

*Deal Value.* This variable can be seen as a proxy for the size of the target company including the acquisition premium. The deal size variable actually shows opposite results to the acquirer's size variable with positive coefficients in each of the models. These results actually suggest that the bigger the deal, the better the post-event performance. Together with the negative effect of the acquirer's size, this can be interpreted as relatively smaller acquirers involved in high value deals do perform better on average. Two of the observed coefficients are also statistically significant with values of 0.16 for the non-adjusted and 0.12 for the industry-adjusted post-event EVAs. These results can be interpreted again as each dollar of the deal value improving the acquirer's post-event EVA by the coefficient's value.

*Acquirer's BTM.* The Book-to-market ratio indicates the companies over- or under-valuation by the market relative to its book value.. Opposing to the assumption of overvalued acquirers performing worse in the post-event period, the results show that on average, more overvalued companies do in-fact have a higher post-event EVA. The BTM coefficient is however significant only in one observation. These results can be biased due to the small sample size and the fact that 38 out of the 49 observations show BTM ratios of less than 1, indicating overvaluation by the market.

*Dummy variables.* The previously examined binary characteristics were utilised as dummy variables. Overall, we see that there is no consensus between the different models on the effects the three dummy variables provide. The only pattern we can observe is that when the industry-adjusted EVA is explained, the effect of the variables is pretty much opposite to the Non-adjusted EVAs (including the EVA improvement measure). However, except for one observation, the dummy variable's coefficients are not statistically significant. Only the high business overlap dummy is significant in the industry-adjusted EVA model, suggesting a positive performance for companies acquiring targets with similar businesses. The coefficients of determination also suggest that these variables do provide only little explanatory power to the models. Interestingly, in model 2 of the industry-adjusted EVA, applying only the pre-event performance and the three dummy variables, we observe a significantly negative intercept. This implies that deals using cash as payment, having low business overlap and having paid a lower than median premium for the target do significantly lose in the post-event period.

Summarising the findings from the attribution analysis it can be concluded that the industry-adjusted EVA models provided the most explanatory power with a R-squared values of up to 0.69. The variance in the Non-adjusted post-event EVA as well as the excess EVA improvements has been explained by only around 0.4 squared. The lack of statistical significance of the explanatory variable's coefficients can be partly attributed to the small sample size. From the obtained results we can also conclude on several hypotheses. The significantly negative coefficients of the acquirer's size factor do support the acceptance of hypothesis H.2.4A. The other

variables do however show mixed results and lack statistical significance. Therefore I cannot accept hypotheses H2.4B nor H2.5. The resulting coefficients do also not provide any significant evidence supporting the earlier examined hypotheses H2.1, H2.2 or H2.3.

## **6.4 Dependency analysis**

So far we have seen the relation between the events performance and various firm- and deal-specific characteristics. However, as the literature on the post-event performance measurement is very broad and implies a variety of performance measures it should be interesting to also evaluate on the relation between these. By undertaking such an analysis we can observe if the performance variables capture similar performance patterns and therefore if the results in the various empirical studies are comparable between each other. In this section I will first compare the various obtained performance measures based on their median values and other descriptive statistics. Further, I conducted a non-parametric Spearman-correlation analysis.

### **Performance measures - Characteristics**

All three previously introduced EVA performance measures as well as three market related measures and their respective descriptive characteristics are presented in Table 6.8. From the general medians in Table reftab:perfchar we see, that all of these measures point in the direction of M&A events being associated with negative post-event performance, with values ranging from -32 million to -162.7 million dollars.

While the excess EVA improvements measure suggests about the same amount of negative observations as the aggregated median Non-adjusted EVA, the underperformance is suggested to be almost 5 times larger with a median value of almost -163 million dollars. However, the same difference in magnitude also holds true for the variance in the results. When comparing the concrete M&A events in the sample I found that 25 (out of the 30 and 29 observations respectively) are labeled as having negative post-event performance by both measures. The median industry-adjusted EVA measure is closer to the excess EVA improvements measure. However the difference in the value ranges is still high. When comparing the negative performing transactions between the excess EVA improvements measure and the industry-adjusted EVA measure, again 25 overlapping observations were found (out of the 29 and 38 respectively).

The dollar value of the acquirers median cumulative abnormal return around the announcement date is -33 million dollars with most of the observations showing negative values. This results corresponds with the findings made by Sirower and O'Byrne (1998), that the initial markets reaction does point in the right direction of negative performance, however is not able to fully quantify the magnitude of the post-event performance. It is also important to mention that the 10-day CAR only reflects the markets early expectations and cannot

fully reflect the integration costs and actual price paid for the target. The Buy-and-Hold Abnormal Returns also suggest a negative performance over the 5 year period of 116.1 million dollars (measured with the market return as benchmark) and -147.8 million dollars (calculated by the matching firm methodology). Here it is noticeable, that the variance of the results within the sample is much higher than that of the EVA measures. Also the amount of negative observations is slightly lower, suggesting that less of the transactions actually underperformed. However the ones that did, underperformed much more pronounced. This can be possibly attributed to the fact, that the post-event period of some of the M&As overlaps with the financial crisis of 2008 and therefore their stock performance's variance was influenced by the high market.

**Table 6.8** Performance Measures - Characteristics

Performance Measures	Median	#Negative	SD	Min	Max
EVA_IMP	-162.7	29	7 493.3	-24 981.8	32 185.7
NA_EVA_CH	-32.0	30	744.0	-2 750.5	3 584.8
IA_EVA_CH	-99.0	38	852.8	-3 201.6	1 478.2
CAR_ACQ	-32.6	32	487.7	-1 345.6	1 986.8
BHAR_MR	-116.1	28	10 328.1	-7 134.6	66 289.8
BHAR_MFM	-147.8	27	14 208.0	-63 797.4	55 097.0

All variables are presented in median value terms and in millions of dollars. Column #Negative presents the number of observations with negative value in the respective year. EVA\_IMP refers to the Capitalised PV of excess EVA improvements calculated by the methodology presented in section 4.2.2. CAR\_ACQ is the acquiring companies 10-day abnormal return around the announcement date of the M&A. BHAR\_MFM represents the Buy-and-Hold Abnormal Returns over the five year post-event period calculated using the matching firm methodology presented in section 4.4. NA\_EVA\_CH refers to the median difference in performance obtained by the non-adjusted EVA and IA\_EVA\_CH to the median difference in performance obtained by the industry-adjusted EVA. Both calculated in section 6.1.

## Correlation Analysis

To further investigate the dependencies between the performance variables I conducted a correlation analysis. As indicated earlier, the performance measures will most likely not have a normal-distribution and this characteristic should be taken into account. Therefore I conducted a non-parametric Spearman correlation instead of a standard Pearson correlation. The resulting correlation matrix is presented in Table 6.9.

Not surprisingly we see that the excess EVA Improvements measure does significantly correlate with the post-event EVAs and also with the median EVAs obtained by the change models. These correlations are logically stronger for the non-adjusted EVAs than the Industry-adjusted EVA values. These results support the earlier findings. The different EVA measures capture similar post-event performance, but the excess EVA improvements measure shows a different magnitude of the performance.

We do not observe any significant correlations between the market related measures of performance and the excess EVA improvements measure. This directly contradicts the findings made by Sirower and O'Byrne (1998) who found very strong and significant correlations between this EVA measure and short- and long-term market measures of performance. The industry-adjusted median EVA obtained by the change model shows a low but significant correlation with the CAR. Further, all of the applied post-event EVA measures also show significantly positive correlation coefficients with the CAR. The industry-adjusted EVA shows a significantly negative correlation with the BHAR measure calculated using the market returns as benchmark. The BHAR calculated using the matched firm methodology does surprisingly not correlate with any of the EVA performance measures.

**Table 6.9** Spearman Correlation Matrix

<b>Spearman Correlation</b>	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
EVA_IMP (1)	1.00												
CAR_ACQ (2)	0.19	1.00											
BHAR_MR (3)	0.06	-0.20	1.00										
BHAR_MFM (4)	-0.11	-0.36**	0.55***	1.00									
NA_EVA_CH (5)	0.69***	0.13	0.28*	0.15	1.00								
IA_EVA_CH (6)	0.49***	0.25*	0.07	0.04	0.64***	1.00							
NA_EVA_PRE (7)	-0.16	0.20	-0.13	-0.22	-0.22	-0.12	1.00						
NA_EVA_POST_Y5 (8)	0.69***	0.35**	0.09	-0.09	0.68***	0.5***	0.26*	1.00					
NA_EVA_POST (9)	0.49***	0.35**	0.09	-0.02	0.72***	0.49***	0.35**	0.85***	1.00				
IA_EVA_PRE (10)	-0.17	0.19	-0.25*	-0.22	-0.26*	-0.04	0.66***	0.11	0.17	1.00			
IA_EVA_POST_Y5 (11)	0.26*	0.27*	-0.23	-0.12	0.32**	0.64***	-0.24*	0.24	0.24*	0.04	1.00		
IA_EVA_POST (12)	0.4***	0.35**	-0.06	-0.07	0.53***	0.88***	0.07	0.44***	0.52***	0.31**	0.63***	1.00	
\$Premium (13)	0.06	-0.23	-0.15	-0.09	-0.13	-0.24*	0.24*	0.12	-0.01	0.07	-0.25*	-0.25*	1.00

EVA\_IMP refers to the Capitalised PV of excess EVA improvements calculated by the methodology presented in section 4.2.2. CAR\_ACQ is the acquiring companies 10-day abnormal return around the announcement date of the M&A. BHAR\_MFM represents the Buy-and-Hold Abnormal Returns over the five year post-event period calculated using the matching firm methodology presented in section 4.4. NA\_EVA\_CH refers to the median difference in performance obtained by the non-adjusted EVA and IA\_EVA\_CH to the median difference in performance obtained by the industry-adjusted EVA. Both calculated in section 6.1 Pre and Post EVA measures are the median values of the five-year pre- and post-event periods. \$Premium represents the dollar value of the premium paid for the target. The levels of significance are denoted as: \* for  $p < 0.10$ , \*\* for  $p < 0.05$  and \*\*\* for  $p < 0.01$

There has also not been found any correlation between the CAR and the long term BHAR benchmarked to the market portfolio and even a significantly negative correlation with the BHAR benchmarked using the matching firm methodology. These results can however be attributed to the relatively small sample size and also the financial crisis that influenced the acquirers market price in the post-event integration process of more than half of the sample transactions. Therefore I would also suggest, that EVA is a better measure of the post-event performance through such a period as it bears less irrationality provided by the market participants and better reflects the companies' true value creation.

In the last row we see the correlation between the various performance measures and the dollar value of the premium paid for the target. As mentioned by Sirower and O'Byrne (1998) if the premium paid for the target is justified by the potential future performance it should not be correlated with the performance measures. As we see, this is the case for most of them as their correlations are not significant and therefore not distinguishable from zero. The only significant value we see is a relatively strong negative correlation between the premium and the Industry-adjusted EVA obtained by change model. Interestingly we see a relatively strong positive correlation between the Pre-event EVA and the premium paid for the target, which implies that companies performing better before the event tend to pay higher premiums for their transaction targets. However, this relation disappears after adjusting for industry effects.

In conclusion it can be summarised that there exist dependences between the various performance measure examined. However, since the evaluated sample size is relatively small, these relations might not be fully revealed within this analysis. As assumed, the short-term market reaction is positively correlated with the benchmarked EVA performance measures as well as with the post-event EVAs. These correlation are, also as assumed, of lower value (ranging from 0.13 to 0.35). These findings support hypothesis H3.1, that the market's initial reaction being able to forecast the right direction of future performance, but under-valuing it's magnitude. However, the correlation coefficients are statistically significant only for some of the EVA measures and therefore, hypothesis H3.1 can only be partly accepted. Seeing no correlation at all between the long-term market performance measure (BHAR) and the EVA might indicate that during times of high market irrationality (the period of 2007-2009) EVA does perform as a better indicator of the companies true fundamental value than its market performance. Due to the negative and insignificant results hypothesis H3.2 cannot be accepted.

A general overview of the hypothesis and conclusions obtained from the empirical analysis can be found in Table 7.1.

## 7 — Conclusion

This thesis examined the post-event performance of acquiring companies engaging in major strategic transactions. While there has been a substantial amount of performance measures applied in the empirical research throughout time, this thesis focuses on a yet under-utilised measure, the Economic Value Added (EVA). To assess the long-term post-event performance measurement, two approaches were utilised. Firstly, a standard change model comparing pre-event and post-event performance. This method was applied on the transaction sample companies' non-adjusted EVAs and further, to correct for industry effects, on industry-adjusted EVAs. The second approach then utilised a value-based benchmark, built upon the methodology introduced by Sirower and O'Byrne (1998). This method, compares the required EVA improvements with the actual EVA improvements generated by the bidding company, in the five year post-event period. The results obtained by all three EVA measures (non-adjusted EVA, industry-adjusted EVA, excess EVA improvements) concluded likewise, with major strategic M&As being value-destroying events for the acquiring companies. These results suggest that the generated performance improvements are not able to justify the deal. Therefore, the first two stated hypothesis (H1.1 and H1.2) regarding the acquiring company's underperformance, have been confirmed.

To assess the performance creation of the researched events, various firm- and deal-specific characteristics were examined. There were not found any univariate or statistically significant results on the effects, the method of payment and the business relatedness have on the acquirer's post-event performance. Hence, hypotheses H2.1 and H2.2 were rejected. The premium paid for the target was found to have an positive impact on the acquiring firm's performance, suggesting that higher premium deals are in-fact able to justify this premium with better post-event performance. These results however lacked statistical significance and therefore hypothesis H2.3 was also rejected. Using a linear regression model, the effects of the acquirer's size, the relative size between target and acquirer and the acquirer's Book-to-Market ration were examined. A significantly negative relation between the acquirer's size and the post-event performance was confirmed. This implies that smaller acquirer's are better at integrating the targets and thereby obtaining the synergies provided by the transaction. On the basis of these findings, hypothesis H2.4A has been accepted. Hypotheses H2.4B and H2.5 had to be



rejected for the mixed results and lack of statistical significance. Overall then, the attribution analysis was not able to explain most of the effects that the firm- and deal-specific characteristics have on the acquiring companies' post-event performance. This can mostly be attributed to the small sample size.

Finally, as suggested by various scholars (King et al., 2004; Thanos and Papadakis, 2012), the last two hypothesis were devoted to the analysis of the internal relations between various performance measures. Since the EVA represents an operating performance measure, it was specifically interesting to see its relation to the market related measures of performance. Stewart (1991) and Grant (2003) point out that the EVA is closely linked to the creation of shareholder value over time. If the markets were valuing the company's shares at their true fundamental value, the EVA measure should be strongly related to the market price. From the results, I can partly confirm hypothesis H3.1 of the initial market's reaction being correlated with the EVA performance measures. As suggested, the results confirm a weak uphill linear relationship between the acquiring firms' 10-day cumulative abnormal returns (CAR) and the EVA performance measures. The long-term market performance measures, however, did not show almost any statistically significant results and therefore, hypothesis H3.2 was rejected. These results imply, that either the EVA measure does not reflect the true intrinsic value of the company, or that the market performance was irrational through the measurement period. As some of the observation periods coincided with the financial crisis of 2007 and the subsequent period of market irrationality, the later explanation is more likely. The results were also likely to be impacted by the small sample size. An aggregated summary of the stated hypotheses as well as their expected and obtained outcomes is presented in Table 7.1.

Overall, the findings made in this thesis point in the direction of acquiring companies realising significantly negative performance in the post-event period. These results are comparable mainly to the conclusions made by Sirower and O'Byrne (1998) and Yook (2004) who also utilised the EVA as the performance measure. Both these scholars also found a negative effect of M&A events on acquiring company's performance.

### **Limitations and Recommendations**

As stressed out through the results in Chapter 6, the most influential limitation to the undertaken research was the small sample size. Even though, there have been various reasons for the selection of such a specific sample, future research might secure more statistical significance in the results by increasing the amount of researched transactions. There are two major steps that can be taken to achieve a larger sample size while keeping the specific required characteristics. Firstly, the time period can be extended to include more observations. Secondly, since it mostly is not possible to obtain all accounting variables for each party from one source a combination

of various databases should be utilised. Thereby, less observations obtained in the primary sample would need to be excluded due to missing data and information.<sup>17</sup>

**Table 7.1** Hypotheses and Conclusions

Hypothesis	Expected performance	Resulting performance	Conclusion
H1.1	Negative	Negative (+)	Accepted
H1.2	Negative	Negative	Accepted
Hypothesis	Expected difference	Resulting difference	Conclusion
H2.1	Positive	Mixed (-)	Rejected
H2.2	Positive	Mixed (-)	Rejected
H2.3	Positive	Positive (-)	Rejected
H2.4A	Negative	Negative (+)	Accepted
H2.5B	Positive	Mixed (-)	Rejected
H2.5	Positive	Negative (-)	Rejected
Hypothesis	Expected correlation	Resulting correlation	Conclusion
H3.1	Positive	Positive (+)	Partly Accepted
H3.2	Positive	Mixed (-)	Rejected

The Expected column shows the performance, difference or correlation suggested by the respective hypothesis. The Resulting columns show the resulting performance, difference or correlation obtained by the empirical analyses. The signs in the parentheses suggest the statistical significance of the results, with “+” referring to significant and “-” referring to insignificant results.

Applying a specific and input sensible measure such as the EVA, another limitation surrounding data availability and sample creation lies in the quality of the data. I strongly suggest future studies to specifically focus on data quality and built representative samples. Thereby, the methodological flaws and statistical insignificance surrounding the results in this thesis could be mitigated. Beside the accounting data applied, another influential factor in the EVA calculation is the cost of capital. Having used several variables required in the weighted average cost of capital calculation on an industry-average basis, a more detailed and firm-specific calculation could again help the accuracy of the results. Regarding the approach to adjusting EVAs for industry effects a limitation can be seen in the utilised industry-EVAs. Since these were obtained from prof. Damodaran’s database, certain specific methodological biases could have also influenced the outcomes. Therefore, future research should try to test also other industry EVA values and thereby test for the robustness of the resulting industry-adjusted EVAs.

Finally, as suggested by Thanos and Papadakis (2012) I also advice further research to elaborate more on the specific relations between the different measures applied in M&A performance assessment. Combining a

<sup>17</sup>Either on the transaction itself or accounting data necessary to calculate the EVA measures.

set of different performance variables and comparing the outcomes in depth could help reveal different patterns and relations regarding the post-event performance puzzle in general.

# Bibliography

- Agrawal, A., Jaffe, J. F., and Mandelker, G. N. (1992). The post-merger performance of acquiring firms: a re-examination of an anomaly. *The Journal of finance*, 47(4):1605–1621.
- Andrade, G., Mitchell, M., and Stafford, E. (2001). New evidence and perspectives on mergers. *Journal of economic perspectives*, 15(2):103–120.
- Asquith, P., Bruner, R. F., and Mullins Jr, D. W. (1983). The gains to bidding firms from merger. *Journal of Financial Economics*, 11(1-4):121–139.
- Barber, B. M. and Lyon, J. D. (1997). Detecting long-run abnormal stock returns: The empirical power and specification of test statistics. *Journal of financial economics*, 43(3):341–372.
- Boehmer, E., Masumeci, J., and Poulsen, A. B. (1991). Event-study methodology under conditions of event-induced variance. *Journal of financial economics*, 30(2):253–272.
- Bruner, R. F. (2002). Does m&a pay? a survey of evidence for the decision-maker. *Journal of applied finance*, 12(1):48–68.
- Das, A. and Kapil, S. (2012). Explaining m&a performance: a review of empirical research. *Journal of Strategy and Management*, 5(3):284–330.
- Dickerson, A. P., Gibson, H. D., and Tsakalotos, E. (1997). The impact of acquisitions on company performance: Evidence from a large panel of uk firms. *Oxford Economic Papers*, 49(3):344–361.
- Dutta, S. and Jog, V. (2009). The long-term performance of acquiring firms: A re-examination of an anomaly. *Journal of Banking & Finance*, 33(8):1400–1412.
- Fama, E. F. and French, K. R. (1992). The cross-section of expected stock returns. *the Journal of Finance*, 47(2):427–465.

- Fama, E. F. and MacBeth, J. D. (1973). Risk, return, and equilibrium: Empirical tests. *Journal of political economy*, 81(3):607–636.
- Franks, J. R. and Harris, R. S. (1989). Shareholder wealth effects of corporate takeovers: the uk experience 1955–1985. *Journal of financial Economics*, 23(2):225–249.
- Ghosh, A. (2001). Does operating performance really improve following corporate acquisitions? *Journal of corporate finance*, 7(2):151–178.
- Grant, J. L. (2003). *Foundations of economic value added*, volume 99. John Wiley & Sons.
- Gregory, A. and McCorrison, S. (2005). Foreign acquisitions by uk limited companies: short-and long-run performance. *Journal of Empirical Finance*, 12(1):99–125.
- Healy, P. M., Palepu, K. G., and Ruback, R. S. (1992). Does corporate performance improve after mergers? *Journal of financial economics*, 31(2):135–175.
- Healy, P. M., Palepu, K. G., and Rubeck, R. S. (1997). Which takeovers are profitable? strategic or financial? *Sloan Management Review*, 38(4):45.
- Heron, R. and Lie, E. (2002). Operating performance and the method of payment in takeovers. *Journal of Financial and quantitative analysis*, 37(1):137–155.
- Hitt, M., Harrison, J., Ireland, R. D., and Best, A. (1998). Attributes of successful and unsuccessful acquisitions of us firms. *British Journal of Management*, 9(2):91–114.
- Ismail, T. H., Abdou, A. A., and Annis, R. M. (2011). Review of literature linking corporate performance to mergers and acquisitions. *The Review of Financial and Accounting Studies*, 1:89–104.
- King, D. R., Dalton, D. R., Daily, C. M., and Covin, J. G. (2004). Meta-analyses of post-acquisition performance: Indications of unidentified moderators. *Strategic management journal*, 25(2):187–200.
- Koller, T., Goedhart, M., Wessels, D., et al. (2010). *Valuation: measuring and managing the value of companies*, volume 499. John Wiley and sons.
- Lehn, K. and Makhija, A. K. (1997). Eva, accounting profits, and ceo turnover: an empirical examination, 1985–1994. *Journal of applied corporate finance*, 10(2):90–97.
- Loughran, T. and Vijh, A. M. (1997). Do long-term shareholders benefit from corporate acquisitions? *The Journal of Finance*, 52(5):1765–1790.

- Lu, Q. (2004). Do mergers destroy value? evidence from failed bids. *Kellogg School of Management, Northwestern University. Working paper.*
- MacKinlay, A. C. (1997). Event studies in economics and finance. *Journal of economic literature*, 35(1):13–39.
- Maditinos, I., Sevic, Z., and Theriou, N. (2006). The introduction of economic value added (eva) in the corporate world. *The Southeuropean Review of Business and Accounting*, 4(2):1–11.
- Malatesta, P. H. (1983). The wealth effect of merger activity and the objective functions of merging firms. *Journal of financial economics*, 11(1-4):155–181.
- Malkiel, B. G. and Fama, E. F. (1970). Efficient capital markets: A review of theory and empirical work. *The journal of Finance*, 25(2):383–417.
- Malmendier, U. and Tate, G. (2005). Ceo overconfidence and corporate investment. *The journal of finance*, 60(6):2661–2700.
- McLaughlin, R., Safieddine, A., and Vasudevan, G. K. (1998). The information content of corporate offerings of seasoned securities: An empirical analysis. *Financial Management*, pages 31–45.
- Meeks, G. (1977). *Disappointing marriage: A study of the gains from merger*, volume 51. CUP Archive.
- Miller, M. H. and Modigliani, F. (1961). Dividend policy, growth, and the valuation of shares. *The Journal of Business*, 34(4):411–433.
- Mitchell, M. L. and Mulherin, J. H. (1996). The impact of industry shocks on takeover and restructuring activity.
- Mitchell, M. L. and Stafford, E. (2000). Managerial decisions and long-term stock price performance. *The Journal of Business*, 73(3):287–329.
- Moeller, S. B., Schlingemann, F. P., and Stulz, R. M. (2004). Firm size and the gains from acquisitions. *Journal of financial economics*, 73(2):201–228.
- O’Byrne, S. F. (1996). Eva® and market value. *Journal of applied corporate finance*, 9(1):116–126.
- Papadakis, V. M. and Thanos, I. C. (2010). Measuring the performance of acquisitions: An empirical investigation using multiple criteria. *British Journal of Management*, 21(4):859–873.
- Park, C. (2002). The effects of prior performance on the choice between related and unrelated acquisitions: implications for the performance consequences of diversification strategy. *Journal of Management Studies*, 39(7):1003–1019.

- Ravenscraft, D. J. and Scherer, F. M. (1989). The profitability of mergers. *International journal of industrial organization*, 7(1):101–116.
- Rhodes-Kropf, M., Robinson, D. T., and Viswanathan, S. (2005). Valuation waves and merger activity: The empirical evidence. *Journal of Financial Economics*, 77(3):561–603.
- Roll, R. (1986a). The hubris hypothesis of corporate takeovers. *Journal of business*, pages 197–216.
- Roll, R. (1986b). The hubris hypothesis of corporate takeovers. *Journal of business*, pages 197–216.
- Schoenberg, R. (2006). Measuring the performance of corporate acquisitions: An empirical comparison of alternative metrics. *British Journal of Management*, 17(4):361–370.
- Sharma, A. K. and Kumar, S. (2010). Economic value added (eva)-literature review and relevant issues. *International Journal of Economics and Finance*, 2(2):200.
- Sirower, M. L. and O’Byrne, S. F. (1998). The measurement of post-acquisition performance: Toward a value-based benchmarking methodology. *Journal of Applied Corporate Finance*, 11(2):107–121.
- Stewart, G. B. (1991). *The quest for value : the EVA management guide*. HarperBusiness,.
- Stewart Iii, G. B. (1994). Eva?: fast and fantasy. *Journal of applied corporate finance*, 7(2):71–84.
- Thanos, I. C. and Papadakis, V. M. (2012). The use of accounting-based measures in measuring m&a performance: a review of five decades of research. In *Advances in mergers and acquisitions*, pages 103–120. Emerald Group Publishing Limited.
- Tichy, G. (2001). What do we know about success and failure of mergers? *Journal of Industry, Competition and Trade*, 1(4):347–394.
- Tuch, C. and O’Sullivan, N. (2007). The impact of acquisitions on firm performance: A review of the evidence. *International Journal of Management Reviews*, 9(2):141–170.
- Yook, K. C. (2004). The measurement of post-acquisition performance using eva. *Quarterly Journal of Business and Economics*, pages 67–83.
- Zollo, M. and Meier, D. (2008). What is m&a performance? *The Academy of Management Perspectives*, 22(3):55–77.