Master Thesis Financial Economics

"The impact of Mergers and Acquisitions in the long-term operating performance"

Empirical research on the US market

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Abstract

In this study, I examine the impact of Mergers and Acquisitions on the long-term operating performance of US firms. Furthermore, I investigate whether some "classic" and some less examined deal characteristics can predict the post-acquisition operating performance for the combined firm. I introduce the importance of the acquirer's managerial ownership as a possible explanatory determinant. My research contributes to and enriches the existing literature for the following reasons. First, most of the existing studies which examine post-acquisition performance are based on market performance measurements. Studies based on changes in operating performance following takeovers in order to evaluate the impact of merger and acquisition of firms is limited. Second, the limited researches examine the post-acquisition operating performance after an M&A transaction yield contradictory results. Lastly, I investigate less examine characteristics such as the impact of M&A waves on the long-term performance and the role of managerial ownership. In an attempt to overpass some of the limitations of previous empirical studies, I employ four different measures of operating performance. Moreover, I employ two models; the change model and the intercept model, and I examine whether the conclusions are different. I demonstrate mix results at the comparison of the performance, as the median post-acquisition performance is significantly different from median pre-acquisition performance for 3 out of 4 measures and positive in two of them. This contrast occurs when taking into account the changes in working capital, highlighting the importance of the measurement applied. However, my results become insignificant after I control for the performance of the peer companies. The analysis of deal characteristics reveals that the method of payment is significant determinants of post-acquisition operating performance. Moreover, my results regarding the cash reserves of the acquirer prior to the deal; reveal significant changes in the profitability of the combined firm. Furthermore, the relative size of the target has a significant negative correlation to post-acquisition profitability. Finally, I find that, although expected differently based on the literature on managerial incentives, the acquirer's managerial ownership level has no significant effect on post-acquisition operating performance.

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1. Introduction

In recent decades, a great number of studies about M&A profitability have been published. Mergers and Acquisitions are a significant determinant of corporate strategies. Among other motives, economies of scale, financial synergy, productivity growth and industry concentration and competitiveness are few common motives behind M&A activity.

In this paper, I examine whether and to what extent the profitability of American listed companies is effected subsequent to the completion of an M&A activity.

My research contributes to and enriches the existing literature for the following reasons.

First, most of the existing studies which examine post-acquisition performance are based on market performance measurements. Studies based on changes in operating performance following takeovers in order to evaluate the impact of merger and acquisition of firms is limited. My research provides evidence for the less examined operating performance, and I apply accounting measurements in a long-term frame in order to reflect any benefit will occur by the M&A activity as some of them need years to be visible.

Second, the limited researches examine the post-acquisition operating performance after an M&A transaction yield contradictory results. Although some studies present a significant improvement in profitability following acquisitions (e.g., Healy et al., 1992; Heron and Lie, 2002), others document a significant decline (Kruse et al., 2002; Clark and Ofek, 1994). Moreover, numerous other literature concludes with insignificant changes in the post-merger profitability (Ghosh, 2001; Moeller and Schlingemann, 2004; Sharma and Ho, 2002). My study attempt to enrich this inconclusive literature by adding new evidence based on recent data.

Lastly, I investigate whether deal characteristics can predict the performance development following an M&A activity. Most specific, I examine whether 'classic' characteristics of the M&A transaction such as the means of payment, deal atmosphere, and industry relatedness have an

impact on the long-term performance of the merged firm in order to enhance the existing literature, and I investigate less examine characteristics such as the impact of M&A waves on the long-term performance and the role of managerial ownership.

In this research I follow closely the structure and methodology of Martynova et al. (2006), however, my analysis provide results for a more resent period of time and my sample is based on US public firm in order to provide a critical benchmark for the majority of current empirical studies which focus in this geographical region. Additional except some “classic” determinants of the post-acquisition profitability I introduce some less examined deal characteristics. Last but not least my analysis focuses and investigates deeply the impact of managerial ownership in the post-acquisition operating performance and examine if the empirical results are in in line with the existing theory.

My analysis is based on a sample of 288 Mergers and Acquisition and considers only the transaction between public firms that took place in the United States of America and were completed between 2003 and 2014. In an attempt to overpass empirical limitations of prior studies I employ four different measures of operating performance: EBITDA and EBITDA corrected for differences in working capital, both scaled by the book value of assets and by value of sales, and use both the change model and the intercept model to analyze these measures.

My results demonstrate the following. First of all, I find that the operating performance of the combined firm following the takeover adjusted for industry trend is not significantly different from the aggregate prior-acquisition performance. However, this insignificant change is positive when I apply 'classic' measurements and negative when including changes in working capital, which indicates the importance of the measurement employed and possibly explains some of the contradictions found in prior research. When looking at the comparison of the "raw" performance, the median post-acquisition performance is significantly different from median pre-acquisition performance for 3 out of 4 measures and positive in two of them. This demonstrates the significant value of the adjustment method applied. This leads to the conclusion that M&A activity is not able to engender substantial increases in operating

performance as is often claimed, but also that corporate takeovers do not generate poor performance as was often reported in earlier academic research.

The analysis of deal characteristics reveals that the method of payment is significant determinants of post-acquisition operating performance. Moreover, my results regarding the cash reserves of the acquirer prior to the deal reveal significant changes in the profitability of the combined firm and partially trend shows that lower cash reserves are indeed related to better operating performance following the takeover supporting free cash flow problem whereas relative size of the target has a significant negative correlation to the post-acquisition profitability.

The outline of this paper is as follows. Section 2 provides an overview of previous relevant empirical studies on the operating performance of firms following a takeover and the determinants that predict the impact of M&A activity on the post-acquisition profitability. Moreover, it explains the theory behind the analysis of managerial ownership as a determinant of the post-acquisition profitability. Section 3 describes the sample selection procedure and the characteristics of my final sample. In addition, it explains the measurements I apply to define the operating performance as well as the selection procedure of peer companies. Section 4 presents the main results regarding changes in profitability of the merged firm following the takeover and examines the determinants of the post-acquisition performance, while section 5 summarizes these results and concludes this paper.

2. Literature

2.1 The post-Acquisition performance

Mergers and Acquisitions during the last decades, due to their significant value, in both economic and strategic effects for firms, have gained the interest of academics and became the center of numerous studies. An extent number of empirical studies investigate the relation between M&A activity and post-acquisition performance, concluding in various results (e.g., Bruner ,2002; Dickerson et al., 1997; Ghosh, 2001; Healy et al., 1992; Martynova et al. 2006; Powell & Star, 2005; Schoenberg, 2006). Meglio & Risberg (2010) explain this as the outcome of

different methodologies used by academics. Researchers have present various reasons why mergers and acquisitions could affect the performance of the involved firms positively, through the creation of operational and financial synergies (Larsson and Finkelstein, 1999), economies of scale (Pangarkar and Lim, 2003), and the establishment of market monopoly (Ikeda and Doi, 1983; Lubatkin, 1983; Sharma and Ho, 2002). Although the essential advantages that mergers and acquisitions can offer, in many occasions several integration problems can overweight the value of these benefits (Nahavandi and Malekzadeh, 1988; Schweiger and Denisi, 1991). Schoenberg (2006) and Slangen (2006) advance that not even managers of merging firms are able to recognize all the obstacles that can be generated.

To be able to answer the question if M&As add or destroy value for involved firms, first, researches had to address multiple hypotheses to recognize the incentives behind those M&As (Gugler et al., 2012, 2003). Motivations abet firms to participate in these mergers and acquisitions are assumed to increase in profitability, market share, and firm growth (Gugler et al., 2003). However, the existing literature is characterized by a broad diversification in both the way academics determine the performance as well as the methods they are using to measure it (Bruner, 2002; Martynova et al.,2006; Zollo and Singh, 2004).

Zollo and Meier (2008) and Bruner (2002) segregate the present studies of takeover performance based on the method applied. Studies examining the financial and economic impact of mergers and acquisitions in merging firms commonly use equity performance or operating performance measurement. On the other hand, organizational behavior studies or researches focusing on strategic management are mainly based on executives' evaluations and clinical studies.

Many arguments are supporting or opposing each of these methods. Wang and Moini (2012) presenting an extensive overview of the methods as well as the advantages and disadvantages for each of them. Schoenberg (2006) supports that, executives' evaluations, although being subjective, include economic and non-economic indexes in a way that can offer more completed measurements. McGee et al. (2005), based in the view that managerial decisions such as mergers and acquisitions must be in favor of shareholders' wealth, suggest that equity

performance measurements are the best indicator to evaluate the effect of a merger and acquisition. Zollo and Meier (2008), on the other side, observed that the commonly used measurements of stock prices in the short period event studies mostly present predictions and expectations of the market. Although the event study methodology is able to test abnormal returns for an extended window period, Martynova et al. (2008) express their restlessness about this application. Campa and Hernando (2004) suggest that the long-term stock returns are related to numerous aspects, in a way that is hard to isolate the pour impact of the takeover. More studies are skeptical regarding the examination of shareholders' equity returns to determine the post-acquisition performance as those stock returns do ton reflect the real benefits from the transaction (e.g. Dickerson et al., 1997).

2.2 Long-term Operating performance

In order to define the value creation or value destruction of M&As, long-term post-acquisition operating performance of firms involved in M&A activity is often examined. The object is to define operating performance using accounting-based evidence, before and after the takeover and investigate if any differences occurred. If the takeover creates value for the merging firm, value generation is expected to be reflected as gains in the operating performance of the merged firm (Andrade et al., 2001). The reason for using accounting measures is based on the idea that most firms involve in Merge and Acquisition deals aim to achieve satisfactory returns. Any benefit will be reflected in firm's financial statements and will be able to be observable through long-term accounting ratios (Papadakis and Thanos, 2010; Thanos and Papadakis, 2012) as some of them need years to be visible (Thanos and Papadakis, 2012). Hence this method provide the opportunity to focus on a broad sense, such as profitability and cash flows (Healy et al., 1992), productivity (Bertrand and Zitouna, 2008), growth rate of sales, or assets (Gugler et al., 2003) return on assets and return on equity Mueller (1980) in order to examine real operating effect and impact on the performance and not expectations over the announcement period. After examined operating performance using multiple ratios, Meeks (1981) suggests that ROA is the optimal measurement to capture the impact of M&A activity in

firms' performance while, on the other hand, Barber and Lyon (1996) propose the use of operating cash flows.

Studies based on changes in operating performance following takeovers in order to evaluate the impact of merger and acquisition of firms is limited and yields contradictory results. Zollo and Meier (2008) examining previous researches remark that only 28% of those studies are based on accounting measurements. The many diversified conclusions raised from the literature can be explained if someone considers the extensive different measurements, adjusting methods, models, and samples researchers practice. Both Healey et al. (1992) and Ghosh (2001) calculate the post-acquisition operating performance based on firms EBIT, and both use the same model, but they conclude in different results, as Healey et al. (1992) adjust based the trend of the industry while Gosh (2001) take also consider size and pre-acquisition operating performance. Besides, although Powell and Stark (2005) and Martynova et al. (2006) follow the same methodology the different sample they use, regarding the geographical region, time and size is probably the cause for the contractor results they conclude, as Martynova et al. (2006) report significant positive impact on operating performance for merging firms while Powell and Stark (2005) find no significant changes. Lastly, long-term operational performance researches, together with long-term equity performance studies, both are affected by macro-economic trends as well as cross country effects. Hence the conclusion of these studies is heavily determined by the benchmark used as a reference.

2.3 Managerial ownership

Besides the impact of M&A on the performance of the involved firms, academics have also examined the determinants that lead to a successful takeover. One crucial factor, however, that has received little attention is the alignment between managerial and shareholders incentives and its impact in the post-acquisition long-term operating performance. First, Berle and Means (1932) recognize that the segregation of ownership and control is able to drive to numerous possible arguments and interest collusion between shareholders and managers if their incentives are not aligned. Although managers' role is to act in favor of shareholders' interest, they may also take actions for their own benefits, and one of these decisions is the involvement

of the firm in takeover activity. The object of M&A should be the maximization of shareholders' wealth; however, this is not always the case, as other factors are able to motive these actions. (Jensen, 1986; Shleifer and Vishny, 1988; Morck, Shleifer and Vishny, 1990).

Empire building theory advance that managers may attempt to increase the size, scope, and market value of assets of their firm rather than take action to benefit shareholders and in that way, participate in Mergers and Acquisitions with the only intention to achieve more significant market share and more assets under their control. Additional, many researchers support that managers pursue to gain wealth, power, and fame (Avery, 1998; Rhoades, 1983). Gaughan (2004) suggest that merge and acquisitions can increase power and future job opportunities for the acquiring manager while Avery et al. (1998) examine the subsequent career of CEOs and suggest that M&A activity can increase their reputation. Moreover, Amihud and Lev (1981) support that if managers' compensations are calculated based on the company's revenue, then managers have motives to participate in diversifying takeovers to hedged against fluctuations, even though shareholders can easily manage their own risk in a lower cost. Another conflict of interest between shareholders and managers takes place if an investment's pay off occurs out of the time-window of the manager's interest, for example, if a manager plans to leave the firm earlier than the acquisition's benefits being observed. Bebchuck and Grinstein (2005) report a positive relationship between managerial compensation and firm size. In that way, managers are motived to involved in mergers and acquisitions if those increase the size of the firm, even if this is against the benefits of the shareholder. Managers who are willing to secure their position within the firm may increase company's dependency on them by proceeding in specific acquisition even though that this action may destroy value for the company or better alternatives are available (Schleifer and Vishny 1988)

Although there are many motives for managers to participate in a Merge and Acquisition, even against the benefits of their shareholders, little is known about the impact of those decisions in the long-term operating performance for the merged firm. Park (2007) report that firms with intense agent problem are involved in more acquisitions and achieve lower post-takeover performance. Sudarsanam and Huang (2006) examine the sensitivity of managers' wealth to

fluctuations in share prices and equity return volatility and concludes that higher sensitivity leads to better performance following a takeover. Bargeron et al. (2008), studying the short-term equity performance of public targets after an acquisition, an advance that public firms with high managerial ownership, due to lower agency problems, pay less premium when acquiring a public firm.

As the above managerial incentives are generated from the separation of ownership and control, I am expecting their impact on managerial actions to become less intensive as the gap between shareholders' and managers' interest shrinks. In other words, if managers and shareholders have a common interest, these decisions stop benefit managers and become value-destroying decisions for both. When managers' interest is aligned with the interest of shareholders, it would be more valuable for them to make decisions and act in favor of the shareholders. Therefore, I assume that managers who own a significant share of the company under their control to participate in more profitable merges and acquisitions.

2.4 Deal Characteristics

An extended amount of research advance that there are several deal characteristics related to post-takeover performance for mergers and acquisitions. Above I present some of these determinants and discuss how they are affecting takeover performance.

2.4.1 Domestic versus cross-border

Many aspects can determine the outcome of cross-border mergers and acquisitions, such as trade agreements and currency transaction rates (Erel et al., 2012). Bertrand and Betschinger (2012) and Erel et al. (2012) both support the view that cross-border deals can lead to a positive outcome for involved companies. Wang and Boateng (2007) highlight the importance of geographic diversification in the firm's stability. Also, bidders gain the opportunity to access new markets and absorb new R&D knowledge and skills (Eun et al.,1996). Despite those benefits, many studies of cross-border acquisitions remark the possible threats that may block the gains of this geographical diversification and even impact the performance of acquirer negatively (Moeller and Schlingemann, 2005). Goergen and Renneboog (2004), Moeller and

Schlingemann (2004), and Martynova and Renneboog (2006) support the view against foreign merger and acquisition activity as observing higher positive impact for acquirers' returns that participate in domestic M&As activities. Results become even more complicated as Martynova et al. (2006), and Gugler et al. (2003) do not find remarkable differences regarding domestic or cross-border deals.

2.4.2 Industry relativeness

Even though diversified takeovers can generate operational and economic synergies, these acquisition activities are related to numerous drawbacks. Schleifer and Vishny (1991) highlight the possible rise of agency problems while Rajan et al. (2000) the creation of bargaining issues within the company. Problems are able to overcome the potential advantages and lead to worse outcomes for the merged firm. An extensive number of studies report that conglomerate strategies are related to more mediocre performance after the transaction (Healey et al. ,1992; Heron and Lie, 2002). On the other side, Ghosh (2001) and Kruse, Park, Park, and Suzuki (2007) report a positive relationship between acquisitions of firms operating in different industries and post-merged operating performance. Regarding the focused versus unrelated acquisitions Martynova et al. (2006) and Powell and Stark (2005) present that performance is unaffected.

2.4.3 Relative target size

Mergers and Acquisitions of relatively big targets have more potentials to create operational and economic synergies. As a consequence, there are more possibilities to lead an increase in the performance of the combined firm. Linn and Switzer (2001) and Martynova et al. (2006) support this view and conclude that acquisitions of analogous large targets, regarding the size of the bidder, lead to better outcomes. However, big targets are more likely to be challenging to incorporate or more possible to have better negotiation power and, therefore, to be more expensive. These results are observed by Clark and Ofek (1994), who report better performance in cases that bidders acquirers a smaller target relative to their size and demonstrate it as the consequence of the obstacles firms dealing when managing a sizeable merged firm. After all, the relative size of the target can benefit the combined firm through synergies and economies of scale but also can destroy them. Although those studies present the acquisition's relative size

as an performance moderator an extensive number of empirical studies conclude that the impact of the size of target, relative to the acquirer's has negligible impact to the performance following the acquisition (Powell and Stark, 2005; Moeller

and Schlingemann, 2004; Heron and Lie, 2002; Sharma and Ho, 2002; Kruse et al., 2002; Healy et al., 1992).

2.4.4 Method of payment

A significant performance moderator on mergers and acquisitions is the method of payment. Based on numerous empirical studies, deals financed all in cash are connected to relatively better performance and/or higher profitability following the acquisition (Linn and Switzer, 2001; Ghosh, 2001; Moeller and Schlingemann, 2004). Additional other researches suggest that cash deals are often using leverage (Ghosh and Jain, 2000; Martynova and Renneboog, 2006). As an explanation, using debt to finance mergers and acquisitions has, as a consequence, the reduction of available cash for the firm and by extension, leads to managerial discipline (Jensen,1986). In contrast, Healey et al. (1992) and Martynova et al. (2006) do not find a significant relationship between post-acquisition long-term operating performance and means of payment.

2.4.5 Acquirer's cash reserves and leverage ratio

Based on free cash flow problems, managers of firms owning a higher amount of free cash holdings are more expected to make bad decisions and make an investment that destroys the value of the firm (Jensen, 1986). Hence acquisitions with worse post-takeover performance are expected to occur. Empirical studies (Harford, 1999, Moeller and Schlingemann, 2004 and Martynova et al., 2006) support this view, reporting cash-rich firms significantly underperform relative to those with lower cash reserves. In addition, based on the agency problem, firms with high leverage ratios are more likely to monitored by their debtholders. Acquirers with high debt ratios are expected to be under rigorous monitoring and hence more likely to avoid value-destroying investment, such as unprofitable mergers and acquisitions (Grier & Zychowicz, 1994). Therefore, bidders with higher levels of debt ratios are predicted to have better post-acquisition performance than those with lower debt ratios. In order to specify the optimal level,

leverage ratios firm's leverage capacity and financial distress have to be considered. However, Linn and Switzer (2001), Switzer (1996), and Clark and Ofek (1994) report an insignificant effect for operating performance by the pre-acquisition acquirer's debt level.

2.4.6 Deal atmosphere: friendly versus hostile

The deal atmosphere can be a strong determinant of the differences report in post-takeover performance. Friendly takeovers, the ones that target's board of directors approved the transaction, are a more common form of merges and acquisitions (Huang and Walkling, 1987) and are expected to benefit more both firms through synergies, than hostile deals (Morck et al., 1988). Hostile deals can decrease any benefits bidder explore to acquire as the higher premiums related to hostile takeovers, and the defenses mechanism of the target, impact the returns negatively following the takeover. Herman and Lowenstein (1998) observe a decrease in both returns on equity and return on capital employed after a hostile acquisition. However, hostile deals can also be correlated with higher performance for the combined firm, as hostile takeovers are more expensive for the acquirer, in a way that only mergers and acquisitions that lead to high synergies are expected to happen (Martynova et al., 2006). Still, numerous empirical studies examining takeover atmosphere and the relation to operating performance do not observe any significant correlation (eg., Healy, 1992; Ghosh, 2001; Powell & Stark, 2005; Martynova et al., 2006).

2.4.7 Inside vs. outside wave

Harford (2003) analyze the announcement returns of mergers and acquisition based on the time of the takeover and report higher returns for takeover inside the wave relative to those outside of the wave and at the same time relatively higher profitability for deals realized in earlier stage of the wave. These findings are also aligned with Moeller et al. (2005), who examine the fifth takeover wave.

3. Data and Methodology

3.1 Sample

My sample selection procedure is focusing on Mergers and Acquisition and considers only the transaction between public firms that took place in the United States of America and were completed between 2003 and 2014. Most of the studies which examine post-acquisition performance are based on market performance measurements and also structure their sample on the US market. For these reasons, and as my research provides evidence for the less examined operating performance based on accounting measurements, I stay consistent with this geographical area in order to provide a critical benchmark for studies based on equity performance. As one of the determinants of post-acquisition performance that my study considers is, whereas the takeover took place in or out of a merger wave, my sample includes the last completed merger wave 2003-2007 as well as the earlier possible mergers and acquisitions I can examine. My methodology requires at least three years of accounting data following the acquisition so, deals that occurred after December 2014 are not able to be examined in my research and are excluded from my sample. One of the main focuses of my study is the impact of managerial ownership concentration in post-acquisition operating performance; for this reason, I will only include deals where both the acquirer and target are listed companies.

Besides, my sample follows the above criteria. Acquirer owns less than 50% of the target before the takeover and increases its share to over 50% after the transaction. The transaction is completed, and the deal value is over 1 million. From my sample, I exclude the deals in which the bidder acquired more targets or was acquired, or the target was re-sold within the three years after the deal completion. From my sample, I also exclude takeovers in which either the bidder or the target is a government, financial institution, or investment company.

3.2 Benchmark group

By measuring the changes in the operating performance of the firms involved in M&A activity, I have to take into account that these changes are not generated entirely from the takeover, but more factors affect my results. Even if I report an increase in the performance of the merging firm, it is possible that this increase would have been much higher in the absence of the merger. In order to face this issue, and following previous studies, I will create a benchmark group of firms. Without using a benchmark, the conclusion may be biased. Therefore, I will compare the "raw" performance of my sample with the performance of a benchmark group, which reflects the performance that would have been generated if the takeover did not have taken place. In this way, I isolate the impact that M&A activity caused.

In order to achieve the isolation of takeover's impact on the performance of involved firms, literature advances numerous different adjustments. Healy et al. (1992), in order to predict how the performance of the involved firms would have changed in the absence of the takeover, suggests an adjustment for the industry trend. Barber and Lyon (1996), on the other hand, suggest the creation of a benchmark group of firms suchlike to the acquiring and the acquired companies separately, before the completion of the deal but that they were not involved in an M&A activity. Each bidder/target is matched with another firm that is as similar as possible regarding the industry, assets, and pre-acquisition performance. Martynova et al. (2006) employ both adjusted methods and report non-significant differences between the two methods in most cases. On the other side of the coin, my sample consists only of public firms. Akguc, Serkan, et al. (2015) suggest that "Private firms are more efficient operationally than public firms due to managerial flexibility," and my measurements are entirely focusing on operational performance. Considering all the above suggestions, I conclude to adjust for industry trends, using as a proxy for each acquirer and target the performance of the median public firm operating in the same industry based on 2-Digid SIC-code.

3.3 Methodology

The idea to adapt accounting-based measures to reflect the post-results of an M&A activity in company's performance source on the rationale that most M&A transaction arises to generate higher performance for merging firms and this performance is intensively visible by focusing at long-term accounting measures such as the return on assets. (Papadakis and Thanos, 2010; Thanos and Papadakis, 2012b).

The examination based on operating performance gives the researcher the ability to focus on costs and efficiency, with the benefit of examining real observed operating impacts rather than expectations. Therefore, the performance in the years before the deal [-1,-2,-3] is compared to the performance in up to three years following the deal [1,2,3], as three years can present the effect from an M&A activity (Rao-Nicholson et al., 2016). The year when the deal completed [0] is not taken into account in the analysis as it includes both periods prior and post to the transaction that might affect the results

Most of the studies focusing on the long-term post-acquisition operating performance of the M&A activity use EBITDA and pre-tax operating cash flows to define the operating performance (e.g., Healy et al., 1992; Ghosh, 2001; Heron and Lie, 2002). Multiple empirical research advance that, since it is the sum of operating income, depreciation, interest expense, and taxes, such a performance measure is unaffected by differences in financial structure and the accounting method, making it a pure operating performance measure. However, Martynova et al. (2006) suggest that "EBITDA is not a 'pure' cash flow performance measure, as it does not take into account changes in working capital (changes in receivables, payables, and inventories)." Therefore in my study, I include both EBITDA as well as EBITDA- changes in working capital both scaled by the book value of assets and sales in order to create four different measurements of the performance. In contrast to previous researches scale to Market Value of Assets (e.g., Healy et al., 1992), I will use the book value of assets as the first one may suffer from market participant's future expectations of the firm and market's reaction of the takeover announcement.

Overall, I consider the following four measures of operating performance;

(1) EBITDA / BV_{assets}

(2) EBITDA / Sales

(3) (EBITDA – ΔWC) / BV_{assets}

(4) (EBITDA – ΔWC) / Sales

The third measure of operating performance reflects the effectiveness of a firm to exploit its assets to create cash. The forth measure reflects how much cash is sourced for every dollar of sales. The first and second measures are based on numerous past empirical researches.

In order to determine the success or failure of an acquisition, first, I must predict the outcomes of the involved firms in case that the acquisition did not have taken place. I predict that the performance of the firms involved in M&A in the absence of the M&A would have changed following the trend of their industry, and this change is reflected in studying the changes in sales and profits of the median public firms in their respective two-digit SIC-code industries. When the industry adjusted post-acquisition performance is higher than the industry adjusted pre-acquisition performance, the impact in the performance is positive; otherwise, the impact is considered as unfavorable.

Aiming to determine the variance in operating performance of the firms involved in M&A activity, I first calculate the operating performance for the combined firm before the takeover. I calculate this performance by sum the cash flows of both involved firms and scale it by the sum of their book value of total assets or sales.

$CF_{firm,t} = (CF_{A,t} + CF_{T,t}) / (BASE_{A,t} + BASE_{T,t})$

Secondly, based on my benchmark group, I calculate the peer operating performance of the merged firm before the takeover. I calculate the sum of the weighted average performance of the bidder's and target's peer companies. Like the weights, I use the relative size of the acquirer's and target's book value of total assets or sales.

$$CF_{peer,t} = [BASE_{A,t} / (BASE_{A,t} + BASE_{T,t})] \times (CF_{peer\ A,t} / BASE_{peer\ A,t}) +$$

$$[BASE_{T,t} / (BASE_{A,t} + BASE_{T,t})] \times (CF_{peer T,t} / BASE_{peer\ T,t})$$

In order to calculate the operating performance of the merged firm, for the years following the takeover, I will use the realized cash flows scaled by the book value of total assets or sales of the combined firm.

$$CF_{firm,t} = CF_{AT} / BASE_{AT}$$

Following a similar method as for the peer pre-acquisition operating performance, I calculate the peer post-acquisition operating performance of the merged firm as the weighted average of the operating performance of the bidder's and target's peer company. This time I use as weights the relative size of the acquirer's and target's book value of total assets and sales one year prior to the takeover as the target does not report assets values after the acquisition.

$$CF_{peer,t} = [BASE_{A,t-1} / (BASE_{A,t-1} + BASE_{T,t-1})] \times (CF_{peer\ A,t} / BASE_{peer\ A,t}) +$$

$$[BASE_{T,t-1} / (BASE_{A,t-1} + BASE_{T,t-1})] \times (CF_{peer T,t} / BASE_{peer\ T,t})$$

Finally, in order to adjust the operating performance of the merged firm for industry trends, I calculate the difference between the merged firm's "raw" operating performance and peer performance.

$$CF_{ind\text{-}adjusted,t} = CF_{firm,t} - CF_{peer,t}$$

In order to measure the impact in the operating performance of the merged firm caused by the M&A activity, I will employ both the change as well as the intercept model.

I will use the change model to calculate the difference in operating performance for each firm. I estimate this change as the difference between the median performance for the three years prior to the acquisition and the median performance over the three years following the takeover. Later I test if the operating performance before and following the acquisition is significantly different.

In addition, I will use the intercept model. I will run an OLS regression, using as the dependent variable the median performance measure following the takeover and using the median performance measure before the acquisition as an independent variable. The Intercept will capture the changes in performance while the coefficient reflects the relationship between the performance before and following the takeover. Following, I will test for the significance of the changes.

$$\text{median } CF_{\text{post adj}} = a_0 + a_1 \cdot \text{median } CF_{\text{pre adj}} + \varepsilon$$

Moreover, I will examine if some deal characteristics impact and how, the post-acquisition operating performance for the combined firm. To achieve that, I will compare the median changes in the operating performance of different categories of the variables and will test for the significance of the differences.

Additionally, my research will focus on the ownership characteristics of the acquirer, and I will investigate if ownership concentration can predict post-acquisition operating performance changes. Therefore I will examine if firms with higher managerial concentration achieve higher post-acquisition performance as their managers have better incentives to participate in value-creating merges and acquisitions. To test whether different levels of managerial ownership matters, I partition my sample into two sub-samples by the level of managerial ownership concentration. The sub-samples of "large managerial ownership concentration" includes deals where the manager of the acquirer owns more than 5% of the firm. The rest of the deals are included in the sub-sample of "small managerial ownership concentration."

4. Results

4.1 Sample Description

My final sample of mergers and acquisitions comprises 288 deals, 146 (50,7%) of them completed from 2003 through 2007 and represent the latest completed M&A wave and the remaining 142 (49,3%)completed in the period 2008-2014 which is the latest period I can examine based on my methodology. The deal atmosphere is 97,9% friendly, while there are two hostile deals (0,7%), a deal is considered as hostile if the board of directors at first officially had rejected the offer, and two neutral deals (0,7%), as neutral I describe the deals in which the management of the target has nothing to do with the transaction. The majority of the deals I examine are focused (61,1%), which I defined a deal in which the acquirer and target belong to the same industry based on 2-Digid SIC-code.

The most common method of payment is cash (43,8%), while there are 52 deals (18,1%) where equity as a method of the transaction was preferred and also 110 mix deals (38,2%). In most deals, the acquirer did not own any shares of the target before the announcement of the deal in my sample (95,1%), while only 14 (4,9%) of the acquirers had already shares of the target and they decide to expand their acquisition.

I also examine the cash reserves of the acquirer before the acquisition, and I conclude that the median acquirer had cash reserves equal to the 29% of its own market value before the transaction, while most of the acquisitions involve cash reserves less than 25% (46,2% of deals), although there are 21 acquisitions (7,3%) with more than 75% cash reserves. It is also presented that the pre-acquisition acquirer's leverage is less than 300% of its own value for 255 deals (88,5%) when the median leverage is 54%.

The relative net sales size is defined as the ratio of the target's net sales to bidder net sales in their last financial statement before the announcement of the acquisition. In my sample, the relative net sales size is less than 50% for 202 deals (70,2%), while the median net sales size is 22%. Also, there are eight extreme deals (2,8%) with a size of more than 200%

Finally, I create a sab-sample of 104 cases based on the acquirers of my sample, where managerial ownership information was available. From them, 13 managers of acquirers (12, 5%) own more than 5% of the company's under their management shares, and 91 managers (87, 5%) own less than 5% while the median size is 1,32%.

The most expensive deal in my sample is the mega-acquisition of Gilette Co by Procter and Gamble Co in 2005, with deal values of more than USD 54 billion. The second-largest transaction is the acquisition of XTO Energy Inc by Exxon Mobil Corp in 2009, with a deal value of over 40 billion. The smaller transaction of my sample is the offer of American Software Inc (USD 10.833 million) to Logility Inc in 2009.

4.2 Changes in the long-term operating performance following the acquisition

Table 2 exhibits the results of the change model applied to my sample. The comparison of the industry-adjusted performance prior and post the acquisition suggest insignificant changes in the profitability of the combined firm following the takeover. My results are mixed as two out of four measures suggest an insignificant increase while the rest two reflex and an insignificant decrease in the post-acquisition operating performance. More specifically, Table 2 presents an insignificant increase in performance +0. 96% for measure 1 and +3. 09% for measure two and an insignificant decrease -1. 97% for measure 3 and -1. 18% for measure 4. A possible explanation for this contrast in my results could be the fact that measures 3 and 4 take into account the changes in working capital while the two other measures are not, an aspect that according to Martynova et al. (2006) is not widely used and can lead to a "purer" cash flow measure. This omission may induce a downward bias in the profitability measures. My results are in line with previous empirical researches that report insignificant changes post-acquisition operating performance (Mueller, 1980; Sharma and Ho, 2002; Ghosh, 2001 ;) however, they are in contrast with numerous other studies that advance significant improvements or deterioration. Many and different aspects may cause these contrary results, such as the consist of the sample and the deal characteristics as well as the method to measure the performance. Many studies adjust for the differences across companies by scale the cash flows with the market value of assets, while my analysis is based on the book value of assets.

When looking at the comparison of the "raw" performance, the median post-acquisition performance is significantly different from median pre-acquisition performance for 3 out of 4 measures. Measures scale cash flows by sales both present a significant improvement in the post-acquisition performance. More specifically, a significant increase in the operating performance 2. 96% for measure 2, and 2. 8% for measure 4. On the other hand, measures that use book value of assets in order to adjust cash flows present a decrease in the operating performance following the takeover, this decrease is significant only for measure 1, -11,53%, and an insignificant decrease in the performance -12,93% for measure 3. These deteriorations in post-acquisition performance are in line with Martynova et al. (2006) and Powell and Stark (2005), who suggest that, in general, the raw performance of the combined firm decreases following an M&A activity.

4.3 Robustness checks

Furthermore, I examine if my results are robust concerning different specifications of performance measures. First, I recalculate changes in the operating performance of the combined firm using means instead of medians. For each takeover, I calculate the average 3years pre- and average three years post-acquisition operating performance and adjust it to the industry trend based on the mean pre- / post operating performance of the combine peer companies. Expectedly, the results based on means present bigger changes for most of my measurement than those based on medians as outliers influence them.

More specifically, similarly to the case of the median, I conclude that none of my four measures reveal statistically significant changes in the operating performance of the combined firm following the takeover in the case of industry-adjusted measurement. However, all four of them suggest an insignificant negative impact of the M&A activity on the long term operating performance.

In the case of "raw" performance, the first measure is in line with the case of medians as in both cases, measure 1 advance a significant decrease in the performance, although more prominent in the case of means (-20.29%). Moreover, I also notice a significant decrease in

performance (-19.75%) for measure 3. These deteriorations in post-acquisition performance are in line with Powell and Stark (2005) and Martynova et al. (2006) who suggest that, in general, the raw performance of the combined firm decrease following an M&A activity. Contrary to my previous results based on medians that reveal a significant increase for measure 2 and 4, results based on means present an insignificant decrease (-0.56% and -4.61% respectively). The difference between the results based on means and those based on medians possibly are generated due to a significant influence of the outliers in the case of means. Also, like before, the firm's performance is significantly different from peer performance in the same year in all four performance measures.

In this section, I employ two models; the change model and the intercept model, and I examine whether the conclusions are different. The change model calculates the change in profitability for each firm, whereby the median profitability of the 3 years prior to the takeover is compared to the median profitability over the three years after the takeover. In the table, we can see the median of the difference between post-acquisition performance and pre-acquisition performance. With the Wilcoxon signed-rank test, I then test whether the median post-acquisition performance is significantly different from the median pre-acquisition performance. As we saw before, we performed the same analysis using averages instead of medians (see Table 3).

The intercept model estimates changes in operating performance with the intercept (a0) from the following regression:

$$\text{median } CF_{\text{post adj}} = a_0 + a_1 \cdot \text{median } CF_{\text{pre adj}} + \varepsilon$$

Factor a1 reflects the change of the post-acquisition profitability in relation to a change of pre-acquisition profitability. The intercept a0 would show the value of post-acquisition profitability if the performance before the acquisition was zero.

The coefficient of determination, R2, is the proportion of the variance in the post-acquisition profitability that is predictable from the pre-acquisition profitability. To test for the significance

of the changes, I apply a standard t-test. Also, I examine the correlation between post-acquisition profitability and pre-acquisition profitability.

According to both the change and intercept model, the median profitability of the three years prior to the takeover is not different from the median profitability of the three years after the takeover in all four performance measures as expected and consistent with previous researches (Martynova et al., 2006; Powell and Stark, 2005; Ghosh, 2001;) intercept model presents higher estimated changes in operating performance than change model as it is based on means that are affected by outliers.

As we examine the intercept model, we can see that there is a significant correlation between pre-acquisition profitability and post-acquisition profitability in measures 2 and 4.

More specifically, in measure 2, we can see that the changes in the median profitability after the takeover are not statistically significant. However, the slope coefficient is significant, which suggests that pre-acquisition profitability significantly influences the post-acquisition profitability, and it predicts 30.6% of the post-acquisition profitability. Also, there is a significant correlation between these two variables that show that, as the pre-acquisition performance increases, the post-acquisition performance increases too. The same results are concluded by observing measure 4. Pre-acquisition profitability significantly influences the post-acquisition profitability, and it predicts 5. 5% of the post-acquisition profitability. Also, there is a significant correlation between these two variables that shows that as the pre-acquisition performance increases, the post-acquisition performance increases too.

4.4 The determinants of the post-acquisition performance

In this chapter, I examine whether the deal characteristics can predict the operating performance of the combined firm following the takeover. I investigate if the median post-takeover operating performance is different between deals with different characteristics; method of payment, deal atmosphere, deal inside the wave or out, business expansion strategy (expand the acquisition in a firm that bidder already owns a share or acquirer shares in a new target). Moreover, I examine if the pre-acquisition cash reserves and leverage of the acquirer

impact the post-acquisition performance of the combined firm. Last, a determinant of the post-acquisition performance that I focus my interest on is the size of managerial ownership for the acquirer firm. The test I use is the Kruskal-Wallis Chi-Square test or Mann- Whitney test depending on the number of categories in each determinant. I also investigate by using the Wilcoxon sign rank test if the median post-acquisition performance is significantly different from median pre-acquisition performance for each category of the aforementioned features. Furthermore, I examine if there is a significant correlation between relative net sales size and post-acquisition performance. My focus in this section is on the "raw" performance and the "industry adjusted" performance, and I present results only for measure 3 and measure 4 as according to my literature, they include a "purer" measurement for cash flows and at the same time are less examined.

4.4.1 Method of payment

Table 5 presents the operating performance after the acquisition of the merged firms for the sub-sables of M&A by the method of payment: cash, equity, and mix. First, I examine the hypothesis H0, which assumes that there is no difference in mean post-acquisition performance between the three categories; H0: cash=equity=mix. As Table 5 shows, I reject the null hypothesis on the "raw" performance for measure 3 and the "adjusted" performance for measures 3 and 4. In these cases, we may conclude that there are significant differences in the profitability of corporate takeovers that employ different methods of payment. This conclusion is due to a significant difference in the profitability between cash and equity and also between equity and mix for measure 3 on the "raw" performance and measure 3 on the "adjusted" performance. In all 3 cases where there is a significant difference in the profitability between cash and equity method of payment, median changes in operating performance are always higher in the case of cash payments. Moreover, in both measures in the case of "adjusted" performance, the median post-acquisition operating performance is significantly different from the median pre-acquisition operating performance. Based on numerous empirical studies, deals financed all in cash are connected to relatively better performance and/or higher profitability following the acquisition (Moeller and Schlingemann, 2004; Linn and Switzer, 2001; Ghosh, 2001 ;) Additional other research suggest that cash deals are often using leverage

(Martynova and Renneboog, 2006; Ghosh and Jain, 2000;). As an explanation, using debt to finance mergers and acquisitions has, as a consequence, the reduction of available cash for the firm and by extension, leads to managerial discipline (Jensen, 1986;).Furthermore, in many cases, the median post-acquisition performance is significantly different from the median pre-acquisition performance.

4.4.2 Industry relatedness

Numerous empirical researches examine whether industry relatedness in M&A activity affect the post-acquisition performance of the merged firm (Martynova et al., 2006; Powell and Stark, 2005; Linn and Switzer, 2001; Switzer, 1996; Sharma and Ho, 2002) Table 6 presents the post-acquisition operating performance of the combined firms for the sub-samples of takeover partitioned by determinant of industry relatedness; focused and unfocused. I define as focus the M&A activity between two firms that both are operating in the same 2-digit SIC code; otherwise, the M&A activity is defined as unfocused. I test the hypothesis H0, which says that there is no difference in mean post-acquisition performance between the two categories; H0: focused= unfocused. As table 6 presents, I reject the null hypothesis on the "raw" performance for measure 4. In this case, I suggest that there is a significant difference in the profitability of corporate takeovers between focused and unfocused industry. Furthermore, in two cases on the "raw" performance, the median post-acquisition performance is significantly different from the median pre-acquisition performance.

4.4.3 Deal Atmosphere

Table 7 exhibits the performance of the merged firms following the acquisition for the sub-samples of takeover partitioned employing the deal atmosphere; friendly, hostile, neutral, and not apply. We examine the hypothesis H0, which says that there is no difference in mean post-acquisition performance between the categories; H0: friendly= hostile= neutral= not apply. As it is presented, there are no significant differences in the profitability of corporate takeovers between the categories. Therefore, I conclude that my results do not provide enough evidence to support the expectations that friendly takeovers would benefit more both firms through synergies than hostile deals (Kruse et al., 2007; Morck et al., 1988). Hence, my results are in

line with previous studies that show no significant relationship between the deal atmosphere and post-acquisition operating performance (eg., Healy, 1992; Schwert, 2000; Ghosh, 2001; Powell & Stark, 2005; Martynova et al., 2006). Furthermore, table 7 exhibits that on the "raw" performance (measure 4), there is a significant difference between median pre-acquisition performance and post-acquisition performance when the industry deal atmosphere is friendly. However, the results, in this case, may not be representative due to the small amount of data in some categories.

4.4.4 Inside an M&A wave vs. outside an M&A wave

In this section, I investigate whether Mergers and Acquisition, which took place inside an M&A wave, are associated with a higher post-acquisition profitability. As "deals inside the wave," I consider all deals that qualified all previous criteria and were completed in the period 2003-2007 as this period consists of the last complete M&A wave. Table 8 shows the post-acquisition performance of the merged firms employing factor "deal inside the wave"; deal before 2007 and deal after 2008. I examine the hypothesis H0, which says that there is no difference in mean post-acquisition performance between the two categories; H0: before 2007= after 2008. Results reject the null hypothesis on the "adjusted" performance for measure 3. In this case, I suggest that there is a significant difference in the profitability of corporate takeovers between the deals that are inside the "wave" and the others. Despite Bhagat et al. (2005) and Harford (2003), who suggest higher returns for takeovers that completed inside an M&A wave, my results are not able to support this increase for the post-acquisition operating performance. Furthermore, in two cases on the "raw" performance and one case on "adjusted" performance, the median post-acquisition performance is significantly different from median pre-acquisition performance.

4.4.5 Having "inside information" regarding the target

Acquirer owning a share of the Target prior to the examined deal is a determinant that gains my interest. The main idea is the fact that owning shares of a target provides access to "inside information" regarding the target prior to the takeover, these "inside information" may lead to better evaluation and subsequently to a more profitable long term performance. Table 9 shows

the post-acquisition performance of the merged firms for the sub-samples of takeover partitioned by means of factor "own share before." I examine the hypothesis H0, which says that there is no difference in mean post-acquisition performance if the acquirer was a shareholder of the target before the merger; H0: no shareholder= yes shareholder. As is shown, there are no significant differences in the profitability of corporate takeovers between the categories.

4.4.6 Acquirer's cash reserves and debt

According to the free cash flow theory (Jensen, 1986), acquirers owning a higher amount of free cash holdings prior to the takeover are more expected to make bad investment decisions that destroy the value of the firm. I define as the acquirer's cash reserves the amount of cash acquirer held at the most current financial statement prior to the announcement of the takeover divided by the value of assets at the most current financial statement before the takeover. Thus, I examine the impact of cash reserves to the long term operational performance. Table 10 shows the post-acquisition performance of the merged firms for the sub-samples of takeover partitioned by means of cash reserves; less than 25%, from 25% to 50%, from 50% to 75%, more than 75%. I test the hypothesis H0 that there is no difference in mean post-acquisition performance between the four categories; H0: less than 25%= 25% to 50%= 50% to 75% = more than 75%. I reject the null hypothesis on the "raw" performance for both measures and the "adjusted" performance for measure 4., doing multiple comparisons, on the "raw" performance there is a significant difference between 25%-50% and >75% and <25% and >75% for measure 3, where trend shows that lower cash reserves are indeed related to better operating performance following the takeover. However, my results are not able to support free cash flows problem suggestions as for other measures and adjusted performance; my results do not follow the expected trend.

Table 11 presents the median post-acquisition performance after the takeover partitioned employing leverage; less than 300%, from 300% to 600%, from 600% to 900%, more than 900%. I define as leverage the ratio of net debt to the assets as they are presented at the most current financial statement before the announcement of the takeover. I examine the hypothesis H0

which says that there is no difference in mean post-acquisition performance between the four categories; H0: less than 300%= 300% to 600%= 600% to 900% = more than 900%. My results exhibit an insignificant relation between pre-acquisition leverage and post-acquisition performance likewise to numerous previous researches (Linn and Switzer, 2001; Switzer, 1996;)

4.4.7 Relative net sales size

The relative size of the target is a determinant able to benefit the merger and acquisition through synergies and economies of scale but also destroy them. Table 13 shows the correlation between relative net sales size and post-acquisition performance by using Spearman's rho, which is a nonparametric measure. There is a significant negative correlation in most cases. More specifically, on the "raw" performance for measure 3 and the "adjusted" performance for both measures, there is a small negative correlation, which means that as the relative net sales size increases, the performance is reduced. This evidence is in line with Clark and Ofek (1994), who advance that the difficulties in integrating a relatively large target outweigh the advantages of financial synergies.

4.4.8 Managerial Ownership

Although there are many motives for managers to participate in a Merge and Acquisition, even against the benefits of their shareholders, little is known about the impact of those decisions in the long-term operating performance for the merged firm. In this section, I examine the impact of segregation of ownership and control in the long-term operating performance of the combined firm. Table 10 only concerns cases where company managers are also shareholders. The factor that we examine is the "size of managerial ownership." Although there are many motives for managers to participate in a Merge and Acquisition even against the benefits of their shareholder (Jensen, 1986; Shleifer and Vishny, 1988; Morck, Shleifer, and Vishny, 1990) my primary assumption is that managers who own significant share of the company under their control, will participate in more profitable Mergers and Acquisition as the gap between shareholders and managers interest become smaller. Therefore, the null hypothesis H0, says that there is no difference of mean post-acquisition performance if the shareholder has a big size of managerial ownership (more than 5%) or a small size of managerial ownership (less than

5%); H0: size more than 5%= size less than 5%. As table 12 presents, there are no significant differences in the profitability of corporate takeovers between the categories. Furthermore, the median post-acquisition performance is not significantly different from the median pre-acquisition performance in any case. However, it has to be noted that the results, in this case, may not be representative due to the small sub-sample as a result of limited data availability.

4.4.9 Multivariate Analysis

In this section I present my results regarding the multivariate analysis. I aim to examine the combine effect of all the determinants of post-acquisition profitability that I analyzed in previous sections independently. I employ an OLS regression for different performance measures that has as dependent variable the post-acquisition profitability and as independent variable all the factors that I examined as determinants of the post-acquisition performance. The model has the form:

$$\text{medianCF post adj} = a_0 + a_1 \cdot X_1 + a_2 \cdot X_2 + \ldots + a_9 \cdot X_9$$

As table 14 present, the model is not statistically significant in both cases (p-values > 10%). Also, the proportion of the variance in the dependent variable that is predictable from the independent variables is less than 10% (R square).
I examine multiple multivariate analysis employ numerous different groups of determinants however, my results remain unable to predict the post-acquisition performance. In line with Martynova et al. (2006) “none of the takeover characteristics have significant power to explain the post-merger profitability of combined firms.”

5. Conlusion

Mergers and Acquisitions during the last decades, due to their significant value, in both economic and strategic effects for corporations, have gained the interest of academics and became the center of numerous empirical studies. While many research papers have been written on the stock price performance following a takeover Studies based on changes in

operating performance following takeovers to evaluate the impact of merger and acquisition of firms are limited and yields contradictory results.

In this paper, I investigate the changes in the long- term operating performance following the acquisition of 288 takeovers. My sample selection procedure is focusing on Mergers and Acquisitions and considers only the transaction between public firms that took place in the United States of America and were completed between 2003 and 2014. In an attempt to overpass some of the limitations of previous empirical studies, I employ four different measures of operating performance. Moreover, I employ two models; the change model and the intercept model, and I examine whether the conclusions are different

I demonstrate inconsistent results at the comparison of the "raw" performance, as the median post-acquisition performance is significantly different from median pre-acquisition performance for 3 out of 4 measures and positive in two of them. However, these results become insignificant after I control for the performance of my benchmark group of listed firms, which are chosen in order to control for industry trends. This demonstrates the significant value of the adjustment method applied and suggests that the increase is caused by macroeconomic changes unrelated to takeovers. I find that the operating performance of the combined firm following the takeover adjusted for industry trend is not significantly different from the aggregate prior-acquisition performance. In the case of industry adjusted performance, two out of four measures suggest an insignificant increase while the rest two present and an insignificant decrease in the post-acquisition operating performance. Change is positive when I apply 'classic' measurements and negative when including changes in working capital, which indicates the importance of the measurement employed and possibly explains some of the contradictions found in prior research. Moreover, in line with Martynova et al. (2006) I conclude that the results are profoundly affected by the model applied to calculate the changes as the intercept model reveals higher estimated changes in operating performance than change model as it is based on means that are affected by outliers. My results lead to the conclusion that M&A activity is not able to engender substantial increases in operating performance as is

often claimed, but also that corporate takeovers do not generate poor performance as was often reported in earlier academic research.

The analysis of deal characteristics reveals that the method of payment is significant determinants of post-acquisition operating performance. Moreover, my results regarding the cash reserves of the acquirer prior to the deal reveal significant changes in the profitability of the combined firm. Partially trend shows that lower cash reserves are indeed related to better operating performance following the takeover supporting free cash flow problem; however my evidence is not strong. Moreover, the relative size of the target has a significant negative correlation to the post-acquisition profitability.

My particular focus in my research is the importance of the acquirer's managerial ownership in the development of profitability following a takeover. I examine the impact of segregation of ownership and control in the long-term operating performance of the combined firm and I assume that managers who own a significant share of the company under their control to participate in more profitable merges and acquisitions. However, based on my results there are no significant differences in the profitability of corporate takeovers regarding different levels of managerial ownership. The fact that I find no significant relation between the acquirer's managerial ownership and post-acquisition operating performance contradicts the expectations based on managerial incentive theory. This source recommendations and ideas for future research, applying possibly different measures of managerial ownership or measurement of performance.

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Table 1. Sample description

	Nº of deals	Percent (%)
Panel A: Deal inside the wave		
Deal until 2007	146	50,7%
Deal after 2008	142	49,3%
TOTAL	288	100%
Panel B: Industry relatedness		
Focused	176	61,1%
Unfocused	112	38,9%
TOTAL	288	100%
Panel C: Method of payment		
Cash	126	43,8%
Equity	52	18,1%
Mix	110	38,2%
TOTAL	288	100%
Panel D: Own share before		
Yes	14	4,9%
No	274	95,1%
TOTAL	288	100%
Panel E: Deal atmosphere		
Friendly	282	97,9%
Hostile	2	0,7%
Neutral	2	0,7%
Not Appl.	2	0,7%
TOTAL	288	100%

	Nº of deals	Percent (%)
Panel F: Pre-acquisition acquirer cash reserves[(a)]		
Cash reserves <25%	133	46,2%
Cash reserves 25%-50%	72	25%
Cash reserves 50%-75%	62	21,5%
Cash reserves >75%	21	7,3%
TOTAL	288	100%
(median cash reserves = 29%)		
Panel G: Pre-acquisition acquirer leverage[(b)]		
Leverage < 300%	255	88,5%
Leverage 300%-600%	20	6,9%
Leverage 600%-900%	11	3,8%
Leverage >900%	2	0,7%
TOTAL	288	100%
(median leverage = 54%)		
Panel H: Relative net sales size		
relative net size <50%	202	70,2%
relative net size 50%-100%	55	19,1%
relative net size 100%-200%	23	8%
relative net size >200%	8	2,8%
TOTAL	288	100%
(median net sales size = 22%)		
Panel I: Size of managerial ownership[(c)]		
more than 5%	13	12,5%
less than 5%	91	87,5%
TOTAL	104	100%
(median size = 1,32%)		

[(a)], [(b)] Grouped data based on range in order to summarize and analyze the data.

[(c)]Only cases where managers are also shareholders

Table 2. Changes in operating performance following acquisitions

Measure 1 $\frac{(EBITDA)}{BVassets}$

	"Raw" performance		Industry-adjusted	
	Median	Nr. obs	Median	Nr. obs
Year -3	0,315	288	-0,0007[c)]	288
Year -2	0,305	288	-0,0222[c)]	288
Year -1	0,298	288	-0,0026[c)]	288
Median pre-acquisition performance	0,311	288	-0,0096[c)]	288
Year 1	0,277	288	-0,0026[c)]	288
Year 2	0,266	288	0,0074[c)]	288
Year 3	0,264	288	0,0122[c)]	288
Median post-acquisition performance	0,271	288	0,0065[c)]	288
Median (%) difference	-11,529***	288	0,0959[b)]	288

Measure 2 $\frac{(EBITDA)}{Sales}$

	"Raw" performance		Industry-adjusted	
	Median	Nr. obs	Median	Nr. obs
Year -3	0,144	288	-0,0133[c)]	288
Year -2	0,148	288	-0,0032[c)]	288
Year -1	0,158	288	-0,0168[c)]	288
Median pre-acquisition performance	0,151	288	-0,0156[c)]	288
Year 1	0,158	288	-0,0099[c)]	288
Year 2	0,159	288	0,0001[c)]	288
Year 3	0,156	288	-0,0013[c)]	288
Median post-acquisition performance	0,164	288	-0,0048[c)]	288
Median (%) difference	2,956*	288	3,091	288

Measure 3 $\frac{(EBITDA - \Delta WC)}{BV assets}$

	"Raw" performance		Industry-adjusted	
	Median	Nr. obs	Median	Nr. obs
Year -3	0,296	288	0,0524[c)]	288
Year -2	0,280	288	0,0307[c)]	288
Year -1	0,259	288	0,0151[c)]	288
Median pre-acquisition performance	0,289	288	0,0173[c)]	288
Year 1	0,237	288	-0,0114[c)]	288
Year 2	0,253	288	-0,0067[c)]	288
Year 3	0,239	288	0,0079[c)]	288
Median post-acquisition performance	0,239[c)]	288	0,0058[c)]	288
Median (%) difference	-12,927	288	-1,973	288

Measure 4 $\frac{(EBITDA - \Delta WC)}{Sales}$

	"Raw" performance		Industry-adjusted	
	Median	Nr. obs	Median	Nr. obs
Year -3	0,110	288	-0,0123[c)]	288
Year -2	0,132	288	-0,0077[c)]	288
Year -1	0,124	288	-0,0016[c)]	288
Median pre-acquisition performance	0,121	288	-0,0135[c)]	288
Year 1	0,135	288	-0,0183[c)]	288
Year 2	0,123	288	-0,0014[c)]	288
Year 3	0,131	288	0,0022[c)]	288
Median post-acquisition performance	0,134	288	-0,0009[c)]	288
Median (%) difference	2,8**	288	-1,179	288

****/**/* Significant at 1% / 5% / 10% level. Wilcoxon signed rank test shows that median post-acquisition performance is significantly different from median pre-acquisition performance.*

[a)]/ [b)]/ [c)] Significant at 10% / 5%/ 1% level. Wilcoxon signed rank test shows that the firm's performance is significantly different from peer performance in the same year.

Table 3. Robustness checks

Measure 1 $\frac{(EBITDA)}{BVassets}$

	"Raw" performance		Industry-adjusted	
	Median	Nr. obs	Median	Nr. obs
Average pre-acquisition performance	0.309	288	0.0025[c)]	288
Average post-acquisition performance	0.253	288	0.0064[c)]	288
Median (%) difference	-20.29***	288	-7.71[b)]	288

Measure 2 $\frac{(EBITDA)}{Sales}$

	"Raw" performance		Industry-adjusted	
	Median	Nr. obs	Median	Nr. obs
Average pre-acquisition performance	0.143	288	-0.0124[c)]	288
Average post-acquisition performance	0.148	288	-0.0153[c)]	288
Median (%) difference	-0.56	288	-2.16	288

Measure 3 $\frac{(EBITDA - \Delta WC)}{BVassets}$

	"Raw" performance		Industry-adjusted	
	Median	Nr. obs	Median	Nr. obs
Average pre-acquisition performance	0.273	288	-0,0020[c)]	288
Average post-acquisition performance	0.234	288	0,0076[c)]	288
Median (%) difference	-19.75**	288	-4.92	288

Measure 4 $\frac{(EBITDA - \Delta WC)}{Sales}$

	"Raw" performance		Industry-adjusted	
	Median	Nr. obs	Median	Nr. obs
Average pre-acquisition performance	0.119	288	-0.0121[c)]	288
Average post-acquisition performance	0.127[a)]	288	-0.0213[c)]	288
Median (%) difference	-4.61	288	-8.19	288

***/**/* Significant at 1% / 5% / 10% level. Wilcoxon signed rank test shows that median post-acquisition performance is significantly different from median pre-acquisition performance.*

[a)]/ [b)]/ [c)] Significant at 10% / 5%/ 1% level. Wilcoxon signed rank test shows that the firm's performance is significantly different from peer performance in the same year.

Table 4. The change model versus the intercept model: comparison of results

Panel A: Median change in operating performance (%)		
Measure	Industry adjusted	
	Change model	Intercept model
1. $\frac{(EBITDA)}{BVassets}$	0.1	8,1[(i)](a)
2. $\frac{(EBITDA)}{Sales}$	3.1	-2,3[(i)] (b)
3. $\frac{(EBITDA-\Delta WC)}{BVassets}$	-2.0	9,5[(i)] (c)
4. $\frac{(EBITDA-\Delta WC)}{Sales}$	-1.2	-6,7[(i)](d)

Panel B: Regression models related to the Intercept model

(a) $medianCF^{post\ ind} = 0{,}081 + 0{,}058 \cdot medianCF^{pre\ ind}$ $R^2 = 0{,}8\%$

r =0,090 t=1,529

(b) $medianCF^{post\ ind} = -0{,}023 + 2{,}465 \cdot medianCF^{pre\ ind}$ $R^2 = 30{,}6\%$

r =0,553*** t=11,234[(a)]

(c) $medianCF^{post\ ind} = 0{,}095 + 0{,}058 \cdot medianCF^{pre\ ind}$ $R^2 = 0{,}9\%$

r =0,096 t=1,624

(d) $medianCF^{post\ ind} = -0{,}067 + 0{,}821 \cdot medianCF^{pre\ ind}$ $R^2 = 5{,}5\%$

r =0,234*** t=4,074[(a)]

[(i)] Insignificant difference between pre- and post- acquisition performance

[(a)] Factor a_1 is statistically significant at 1% level

**** Significant at the 1% level; Pearson's correlation coefficient.*

Table 5. Median changes in operating performance by means of payment

"Raw" performance	Measure	Cash	N	Equity	N	Mix	N	H_0 : cash=equity= mix	H_0 : cash=equity	H_0 : equity=mix
3	$\frac{(EBITDA-\Delta WC)}{BVassets}$	0,23	126	0,19**	52	0,27*	110	No[(b)]	No[(b)]	No[(b)]
4	$\frac{(EBITDA-\Delta WC)}{Sales}$	0,14*	126	0,11	52	0,13	110	Yes	Yes	Yes
"Adjusted" performance	Measure	Cash	N	Equity	N	Mix	N	H_0 : cash=equity= mix	H_0 : cash=equity	H_0 : equity=mix
3	$\frac{(EBITDA-\Delta WC)}{BVassets}$	0,06**	126	-0,09*	52	-0,006	110	No[(c)]	No[(c)]	No[(c)]
4	$\frac{(EBITDA-\Delta WC)}{Sales}$	0,005*	126	-0,05	52	-0,001	110	No[(a)]	No[(a)]	Yes

***/* Significant at the 5%/ 10% level; Wilcoxon sign rank test shows that the median post-acquisition performance is significantly different from median pre-acquisition performance.*

[(a)]/[(b)]/[(c)] Significant at the 10%/ 5%/ 1% level Kruskal-Wallis Chi-Square test and Mann-Whitney test shows that the mean post-acquisition performance is significantly different in each group.

Table 6. Median changes in operating performance by means of industry relatedness

"Raw" performance	Measure	Focused	N	Unfocused	N	H_0 : focused=unfocused
3	$\frac{(EBITDA-\Delta WC)}{BVassets}$	0,24*	176	0,23	112	Yes
4	$\frac{(EBITDA-\Delta WC)}{Sales}$	0,14	176	0,12**	112	No[(a)]
"Adjusted" performance	Measure	Focused	N	Unfocused	N	H_0 : focused=unfocused
3	$\frac{(EBITDA-\Delta WC)}{BVassets}$	-0,004	176	0,02	112	Yes
4	$\frac{(EBITDA-\Delta WC)}{Sales}$	0,008	176	-0,02	112	Yes

***/* Significant at the 5%/ 10% level; Wilcoxon sign rank test shows that the median post-acquisition performance is significantly different from median pre-acquisition performance.*

[(a)]/ Significant at the 10% level Mann-Whitney test shows that the mean post-acquisition performance is significantly different in each group.

Table 7. Median changes in operating performance by means of deal atmosphere

"Raw" performance	Measure	Friendly	N	Hostile	N	Neutral	N	Not Apply	N	H_0 : Friendly= Hostile= Neutral= Not apply
3	$\frac{(EBITDA-\Delta WC)}{BVassets}$	0,23	282	0,28	2	0,76	2	0,27	2	Yes
4	$\frac{(EBITDA-\Delta WC)}{Sales}$	0,13**	282	0,04	2	0,22	2	0,30	2	Yes
"Adjusted" performance	Measure	Friendly	N	Hostile	N	Neutral	N	Not Apply	N	H_0 : Friendly= Hostile= Neutral= Not apply
3	$\frac{(EBITDA-\Delta WC)}{BVassets}$	0,002	282	0,15	2	0,41	2	0,11	2	Yes
4	$\frac{(EBITDA-\Delta WC)}{Sales}$	-0,002	282	-0,008	2	0,02	2	0,16	2	Yes

*** Significant at the 5% level; Wilcoxon sign rank test shows that the median post-acquisition performance is significantly different from median pre-acquisition performance.*

Table 8. Median changes in operating performance by means of deal inside the wave

"Raw" performance	Measure	Before 2007	N	After 2008	N	H_0 : before 2007=after 2008
3	$\frac{(EBITDA-\Delta WC)}{BVassets}$	0,22**	146	0,25	142	Yes
4	$\frac{(EBITDA-\Delta WC)}{Sales}$	0,12*	146	0,14	142	Yes

"Adjusted" performance	Measure	Before 2007	N	After 2008	N	H_0 : before 2007=after 2008
3	$\frac{(EBITDA-\Delta WC)}{BVassets}$	-0,03	146	0,05	142	No[(b)]
4	$\frac{(EBITDA-\Delta WC)}{Sales}$	-0,01***	146	0,02	142	Yes

****/**/* Significant at the 1%/ 5%/ 10% level; Wilcoxon sign rank test shows that the median post-acquisition performance is significantly different from median pre-acquisition performance.*

[(b)]/ Significant at the 5% level Mann-Whitney test shows that the mean post-acquisition performance is significantly different in each group.

Table 9. Median changes in operating performance by means of "own share before"

"Raw" performance		Measure	No	N	Yes	N	H_0: no=yes
	3	$\frac{(EBITDA - \Delta WC)}{BVassets}$	0,24	274	0,18	14	Yes
	4	$\frac{(EBITDA - \Delta WC)}{Sales}$	0,13**	274	0,12	14	Yes
"Adjusted" performance		Measure	No	N	Yes	N	H_0: no=yes
	3	$\frac{(EBITDA - \Delta WC)}{BVassets}$	0,002	274	0,06	14	Yes
	4	$\frac{(EBITDA - \Delta WC)}{Sales}$	-0,0002*	274	-0,04	14	Yes

***/* Significant at the 5%/ 10% level; Wilcoxon sign rank test shows that the median post-acquisition performance is significantly different from median pre-acquisition performance.*

Table 10. Median changes in operating performance by means of cash reserves

Panel A									
"Raw" performance	Measure	Cash reserves <25%	N	Cash reserves 25%-50%	N	Cash reserves 50%-75%	N	Cash reserves >75%	N
3	$\frac{(EBITDA-\Delta WC)}{BVassets}$	0,26***	133	0,25	72	0,19*	62	0,14	21
4	$\frac{(EBITDA-\Delta WC)}{Sales}$	0,11	133	0,16	72	0,15**	62	0,18	21
"Adjusted" performance	Measure	Cash reserves <25%	N	Cash reserves 25%-50%	N	Cash reserves 50%-75%	N	Cash reserves >75%	N
3	$\frac{(EBITDA-\Delta WC)}{BVassets}$	0,007***	133	0,07	72	-0,04**	62	-0,02**	21
4	$\frac{(EBITDA-\Delta WC)}{Sales}$	-0,01	133	0,02	72	0,009*	62	0,08	21

	Panel B				
"Raw" performance	Measure	H_0 : <25%= 25%-50%= 50%-75%= >75%	H_0: 25%-50%= >75%	H_0: 25%-50%= <25%	H_0: <25%= >75%
3	$\frac{(EBITDA - \Delta WC)}{BVassets}$	No[c]	No[b]	Yes	No[b]
4	$\frac{(EBITDA - \Delta WC)}{Sales}$	No[b]	Yes	No[b]	Yes
"Adjusted" performance	Measure	H_0 : <25%= 25%-50%= 50%-75%= >75%	H_0: 25%-50%= >75%	H_0: 25%-50%= <25%	H_0: <25%= >75%
3	$\frac{(EBITDA - \Delta WC)}{BVassets}$	Yes	Yes	Yes	Yes
4	$\frac{(EBITDA - \Delta WC)}{Sales}$	No[a]	Yes	No[a]	No[a]

****/**/** Significant at the 1%/ 5%/ 10% level; Wilcoxon sign rank test shows that the median post-acquisition performance is significantly different from median pre-acquisition performance.*

[a]/[b]/[c] Significant at the 10%/ 5%/ 1% level Kruskal-Wallis Chi-Square test and Mann-Whitney test shows that the mean post-acquisition performance is significantly different in each group.

Table 11. Median changes in operating performance by means of leverage

Panel A

"Raw" performance	Measure	Leverage <300%	N	Leverage 300%-600%	N	Leverage 600%-900%	N	Leverage >900%	N
3	$\frac{(EBITDA-\Delta WC)}{BVassets}$	0,24	255	0,28**	20	0,24	11	0,20	2
4	$\frac{(EBITDA-\Delta WC)}{Sales}$	0,13***	255	0,20	20	0,26**	11	0,29	2
"Adjusted" performance	Measure	Leverage <300%	N	Leverage 300%-600%	N	Leverage 600%-900%	N	Leverage >900%	N
3	$\frac{(EBITDA-\Delta WC)}{BVassets}$	0,01	255	-0,06*	20	0,03	11	-0,10	2
4	$\frac{(EBITDA-\Delta WC)}{Sales}$	-0,001***	255	0,004	20	0,02*	11	-0,02	2

Panel B			
"Raw" performance	Measure	H_0 : <300%= 300%-600%= 600%-900%= >900%	H_0: 600%-900%= <300%
3	$\frac{(EBITDA - \Delta WC)}{BVassets}$	Yes	Yes
4	$\frac{(EBITDA - \Delta WC)}{Sales}$	No[(c)]	No[(a)]
"Adjusted" performance	Measure	H_0 : <300%= 300%-600%= 600%-900%= >900%	H_0: 600%-900%= <300%
3	$\frac{(EBITDA - \Delta WC)}{BVassets}$	Yes	Yes
4	$\frac{(EBITDA - \Delta WC)}{Sales}$	Yes	Yes

****/**/* Significant at the 1%/ 5%/ 10% level; Wilcoxon sign rank test shows that the median post-acquisition performance is significantly different from median pre-acquisition performance.*

[(a)]/[(c)] Significant at the 10%/ 1% level Kruskal-Wallis Chi-Square test and Mann-Whitney test shows that the mean post-acquisition performance is significantly different in each group.

Table 12. Median correlation between operating performance and relative net sales size

"Raw" performance		Measure	Correlation between performance-relative net sales size	N
	3	$\frac{(EBITDA - \Delta WC)}{BVassets}$	-0,147**	288
	4	$\frac{(EBITDA - \Delta WC)}{Sales}$	-0,075	288
"Adjusted" performance		Measure	Correlation between performance-relative net sales size	N
	3	$\frac{(EBITDA - \Delta WC)}{BVassets}$	-0,246***	288
	4	$\frac{(EBITDA - \Delta WC)}{Sales}$	-0,146**	288

****/** Significant at the 1%/ 5% level; Spearman's rho correlation coefficient.*

Table 13. Median changes in operating performance by means of size of managerial ownership [(a)]

"Raw" performance		Measure	More than 5%	N	Less than 5%	N	H_0 : more than 5%= less than 5%
	3	$\frac{(EBITDA - \Delta WC)}{BVassets}$	0,20	13	0,25	91	Yes
	4	$\frac{(EBITDA - \Delta WC)}{Sales}$	0,12	13	0,14	91	Yes
"Adjusted" performance		Measure	More than 5%	N	Less than 5%	N	H_0 : more than 5%= less than 5%
	3	$\frac{(EBITDA - \Delta WC)}{BVassets}$	0,11	13	0,05	91	Yes
	4	$\frac{(EBITDA - \Delta WC)}{Sales}$	0,02	13	0,02	91	Yes

[(a)]Only cases where managerial ownership data are available

Table 14 : Multivariate Analysis

Measure 3

Regression model	R^2	F	p-value
	3,7%	0,406	0,929
	a_i	t	p-value
	0,452	0,381	0,704
Deal inside the wave (X_1)	0,142	0,466	0,642
Industry relatedness (X_2)	-0,170	-0,847	0,399
Method of payment (X_3)	-0,103	-0,907	0,367
Own share before (X_4)	0,044	0,087	0,931
Deal atmosphere (X_5)	-0,113	-0,195	0,846
Pre-acquisition acquirer cash reserves (X_6)	-0,513	-1,213	0,228
Pre-acquisition acquirer leverage (X_7)	-0,077	-0,775	0,440
Relative net sales size (X_8)	0,063	0,271	0,787
Size of managerial ownership (X_9)	0,123	0,400	0,690

Measure 4

Regression model	R^2	F	p-value
	7,8%	0,885	0,542
	a_i	t	p-value
	0,038	0,182	0,856
Deal inside the wave (X_1)	0,030	0,553	0,582
Industry relatedness (X_2)	0,014	0,391	0,696
Method of payment (X_3)	0,012	0,609	0,544
Own share before (X_4)	-0,176	-1,994	0,049
Deal atmosphere (X_5)	0,003	0,027	0,978
Pre-acquisition acquirer cash reserves (X_6)	0,128	1,728	0,087
Pre-acquisition acquirer leverage (X_7)	0,010	0,601	0,549
Relative net sales size (X_8)	-0,041	-0,995	0,322
Size of managerial ownership (X_9)	0,003	0,063	0,950