TALLINN UNIVERSITY OF TECHNOLOGY

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THE IMPACT OF ACQUISITIONS ON THE ACQUIRER'S LIQUIDITY, SOLVENCY AND PROFITABILITY IN THE BALTICS AND SCANDINAVIA DURING 2015-2017

Master's thesis

Programme Finance and accounting, specialisation Finance

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I hereby declare that I have compiled the thesis independently

and all works, important standpoints and data by other authors

have been properly referenced and the same paper

has not been previously presented for grading.

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TABLE OF CONTENTS

ABSTRACT

The main objective of the thesis is to quantify and explain the effect of M&As on the acquirers' financials in the Baltics and Scandinavia. The main focus is on the impact on profitability, however, liquidity and solvency figures are also analysed on the course of the thesis. The sample consists of over 800 acquisitions during 2015-2017 which are also compared against a peer group of over 60,000 companies.

The analysis is done using three different methods – two sample comparison tests (Wilcoxon tests), shorter ordinary least squares (OLS) regressions and difference-in-difference regressions models.

Wilcoxon tests indicate that liquidity and profitability have significant differences both in comparison to the sample historical figures and vis-à-vis peer group financials. Short OLS regressions indicate that ROA, ROE and EBIT margin differ significantly pre- and post-acquisition (except for EBIT margin vis-à-vis sample historical figures). Difference-in-difference models only confirm the statistically significant difference of ROA margin while ROE and EBIT margin remain inconclusive. According to the difference-in-difference model, ROA of the acquiring company post-acquisition is roughly 2 pp-s lower compared to peers. Three-year averages of the profitability figures show a decrease post-acquisition vis-à-vis pre-acquisition while peer group financials remained stable or even increased slightly.

Although multiple tests show significant differences, others yield insignificant results, thus, a conclusive conclusion cannot be made, however, based on the analysis, the data does seem to indicate that M&As decrease the profitability of the acquiring company.

Keywords: M&As, mergers & acquisitions, profitability, OLS, difference-in-difference

INTRODUCTION

The two growth possibilities for companies are through organic growth and through external growth (mergers and acquisitions or M&As). To remain competitive and to not lose one's competitive advantage, companies often need to turn some of their focus to M&As (Das & Kapil, 2012). M&As have become increasingly more popular and have increased manyfold over the last couple decades. In 1985, there were under 3,000 M&As, while in 2020, the figure was close to 45,000 (*Number of M&A Deals Globally 1985-2021*, 2021).

Historically, mergers and acquisitions have largely taken place in waves (Alexandridis *et al.*, 2012; Beckenstein, 1979; Becketti, 1986; Cordeiro, 2014a). In total there have been seven distinctly identifiable waves. The first spanning from the late 19th to early 20th century and the last one starting in 2014 with a slight decrease in 2020 due to COVID-19. (Cordeiro, 2014b; "M&A Statistics - Worldwide, Regions, Industries & Countries," 2021) The phenomena of M&A waves are not completely understood (Sudarsanam, 1995), however, it is known that they are influenced by economic, regulatory or technological changes, most commonly called "shocks" (Cordeiro, 2014b).

Although M&As have become more and more popular among companies, the theoretical standpoints and empirical evidence regarding M&As is highly contradictory and conflicting (Finkelstein & Cooper, 2018; Gomes *et al.*, 2013a; Renneboog & Vansteenkiste, 2019). Specifically, the profitability and usefulness of M&As is a fierce topic of debate among academics and practitioners as many studies show conflicting results. While, many authors have found evidence showing positive returns and effects post-acquisition (Aggarwal & Garg, 2019; Fernández *et al.*, 2018; Healy *et al.*, 1997; Rani *et al.*, 2013; Ravenscraft & Scherer, 1987; Wu *et al.*, 2020), others have not been so kind (Grigorieva & Petrunina, 2015; Mueller, 1997a; Pazarskis *et al.*, 2006; Tuch & O'Sullivan, 2007). In fact, Mueller (1997, p. 680) said "it is possible, judging from the available evidence on the effects of mergers, that the US economy would be as or even more efficient today, if there had been no mergers over the last 50 years". Grigorieva & Petrunina (2015, p. 377) added that "M&As are value-destroying deals for the combined firms." According

to a study by Ficery *et al.* (2007), only about half of senior executives believed that they had achieved the expected revenue synergies and less than half thought that the expected cost synergies had been captured.

The author chose the subject as M&As are to this day heavily researched with no consensus among the specialists. The author found few studies in the region of the Baltics and Scandinavia. Also, the author works in the field of M&As on a daily basis, thus, the author has additional interests in the impacts of M&As on the companies in the Baltics and Scandinavia. In the master's thesis, the author will measure the impact of M&As on the acquirer's liquidity, solvency and profitability. The author will analyse acquirers from the Baltic and Scandinavia region which were part of a transaction during 2015-2017.

The aim of the master's thesis is to quantify and explain the impact of M&As on the acquirer's liquidity, solvency and profitability. Post-transactions figures will be compared to pre-transaction figures. Additionally, results will be compared with peer companies which will act as a control group to reflect the overall trends in the economy and different sectors. In the context of the master's thesis, the author considers an M&A to be successful if the post-transactions figures have shown improvements vis-à-vis company historicals and vis-à-vis control group figures.

The thesis will provide answers to the following research questions:
1. Is the liquidity of the acquirer impacted by the acquisition?
    a. based on current ratio,
    b. based on liquidity ratio.
2. Is the solvency of the acquirer impacted by the acquisition?
    a. based on asset-based solvency,
    b. based on liability-based solvency.
3. What is the impact of an acquisition on the acquirer's profitability?
    a. based on ROA,
    b. based on ROE,
    c. based on EBIT margin.

The master's thesis comprises three chapters. First chapter gives an overview of mergers and acquisitions in general (including but not limited to, types of M&As and factors which affect the success of an M&A) and previously done empirical studies on which the methodology in the thesis

is based on. The second chapter provides the reader with information on the data collected and methodologies used. The author explains how and why some transactions were excluded, what methodologies were used for which analysis along with the rationale/reasoning. Additionally, the author explains (also graphically) the double-difference (or difference-in-difference) method, all the regression models used in the analysis. In the third chapter, the author gives a detailed overview of the results of the empirical analysis along with conclusions and advice on what to account for in future research.

Information on the transactions will be acquired from Mergermarket and financial information on the acquirers from Orbis Europe. Serial acquirers and companies which had made multiple acquisitions during the period were excluded as the financial data for these companies would already be influenced by previous acquisitions. As the analysis requires three-year info before and after the transaction, the latest possible calendar year used was 2017. Orbis Europe only provides information on the companies from 2012 onwards, thus 2015 was the earliest calendar year used. The final sample consisted of 822 companies. Analysis will be done using the econometrics software Gretl, Microsoft Excel and RStudio.

The results of the thesis are beneficial for future research and it adds to the current deficient research on the Baltic and Scandinavian region. On a more practical side, the thesis will provide additional information to the market participants active in the M&A space.

1. MERGERS AND ACQUISITIONS

Mergers and acquisitions (M&As) are one of multiple ways of company growth and corporate expansion (typically divided into two – organic/internal and inorganic/external). M&As are not the sole means of growth but an alternative to organic (or internal) growth. (Finkelstein & Cooper, 2018; Shleifer & Vishny, 1988; Sudarsanam, 1995)

1.1. Theoretical starting points for M&As

M&As can be differentiated between a plethora of categories (i.e., vertical and horizontal, strategic and financial, cash and equity, MBO (Management buy-out) and LBO financing structure to name the most common ones) (Figure 1).
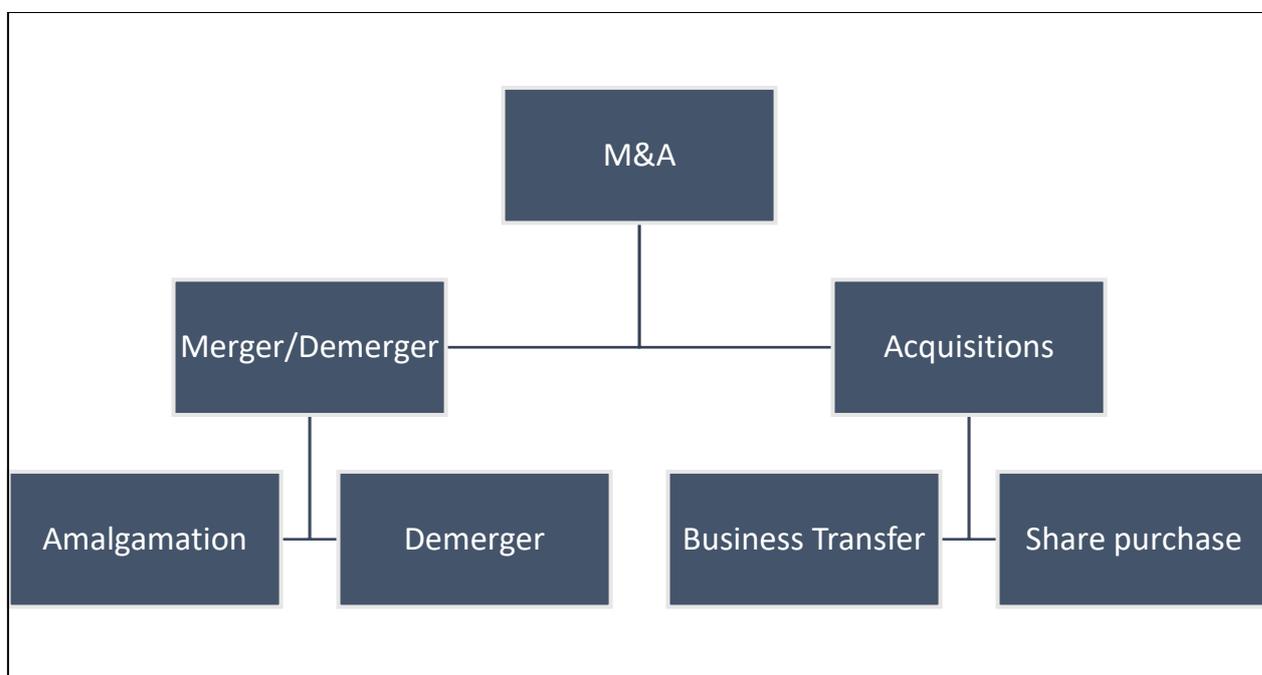
Figure 1. Subsections of M&As
Source: compiled by the author

The author will explain the classifications, different types of M&As and the factors which affect the success of an M&A in the following subchapters.

1.1.1. Types of M&As and classification

In most cases, the end goal of an M&A transaction is simple – generate higher profits to the shareholders (Homberg *et al.*, 2009). The justification of an M&A deal is mainly to achieve higher revenues or market share, diversify product/service portfolio, lower costs through synergies or as a result of economies of scale and/or scope (Homberg *et al.*, 2009). In the case of a merger, the companies join forces (or "merge") to share their resources (Sudarsanam, 1995). Acquirers hope to achieve synergies, increase market share in a particular region, increase bargaining power and/or diversify risks via, e.g., wider geographical or product range (Homberg *et al.*, 2009).
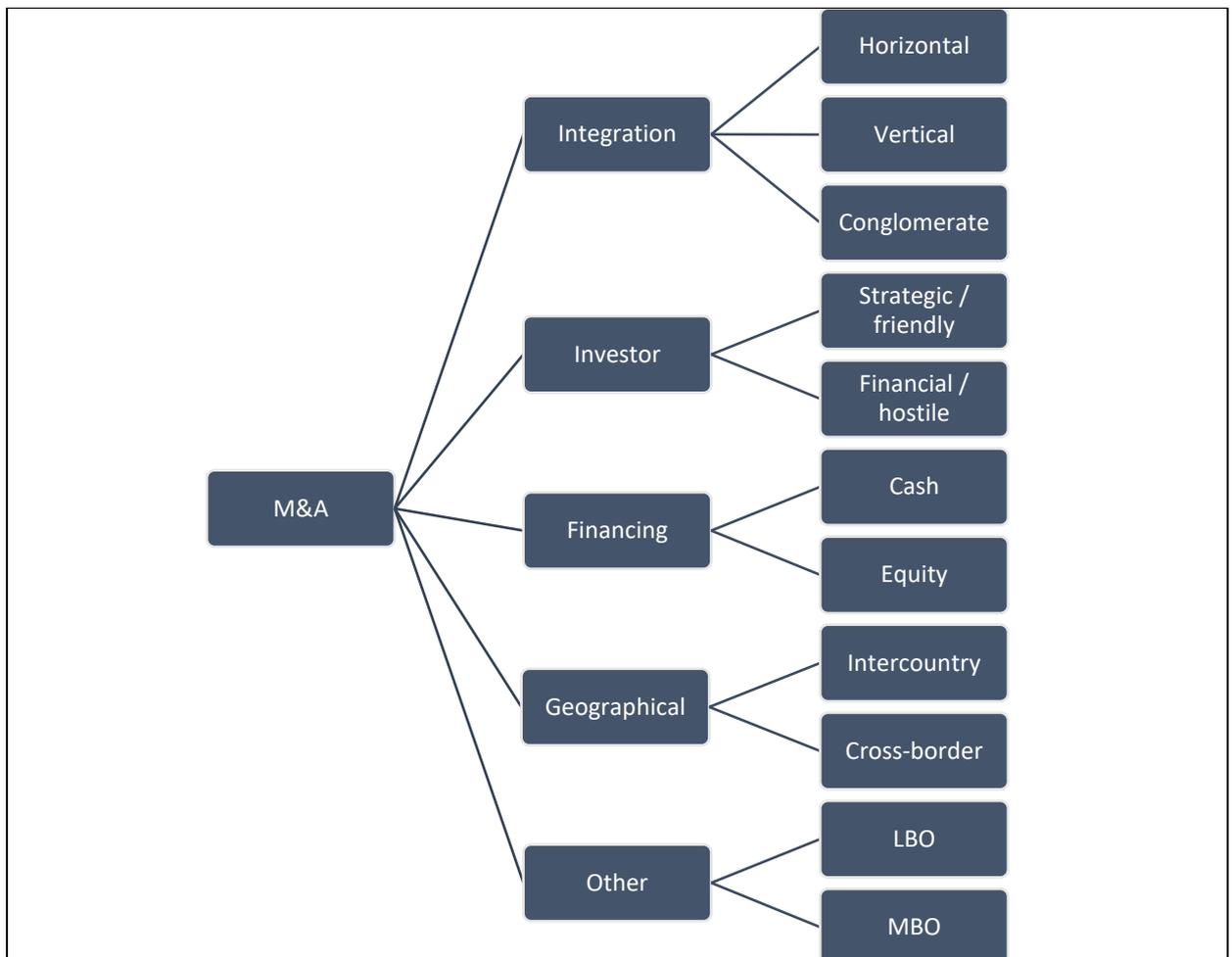
Figure 2. Most commonly used breakdowns of M&As

Source: compiled by the author

One of the most common differentiations made between M&As is whether the transactions is horizontal, vertical or conglomerate (or **integration**). A horizontal merger is between companies selling a similar product – essentially a union of previously competing firms (Becketti, 1986; Bertrand & Zitouna, 2008; Chunlai Chen & Findlay, 2003a; M. Rahman & Lambkin, 2015). Horizontal acquisitions made up roughly 70-80% of all transactions (value-wise) worldwide in the 1990s, 2000s and 2010s (M. Rahman & Lambkin, 2015; UNCTAD, 2000a; United Nations Conference on Trade and Development, 2007). Horizontal acquisitions made up about half of all transactions (number-wise) (UNCTAD, 2000b; United Nations Conference on Trade and Development, 2007). The incentive and motivation behind horizontal M&As is to increase market share, diversify product portfolio and potentially create collusive synergies (Chatterjee, 1986) which either increase revenues further or decrease the company's cost base (Chatterjee, 1986; Gomes *et al.*, 2013a; M. Rahman *et al.*, 2016; M. Rahman & Lambkin, 2015). Vertical acquisitions involve companies in client-supplier or buyer-seller relationships (Becketti, 1986). The motive for vertical acquisitions is typically to decrease uncertainty and transactions costs in the product chain (Chunlai Chen & Findlay, 2003b), to benefit from economies of scale and/or scope (Homberg *et al.*, 2009; UNCTAD, 2000b) and operational synergies (Chatterjee, 1986). Conglomerate M&As are between firms who do not fit into either of the two categories and usually involve companies in unrelated industries (Becketti, 1986). Motives for the companies are most often the diversification of risk, reaching economies of scale/scope and financial synergies. (Chatterjee, 1986; Chunlai Chen & Findlay, 2003b; M. Rahman & Lambkin, 2015; UNCTAD, 2000b)

Another way of classification can be done based on the **investor's motives**. Strategic investors are interested in how the potentially acquired company aligns with its own long-term plans. Usually, the acquired company is in a similar industry to the acquirer. Strategic investors typically expect significant synergies from the investments. Potential financial synergies can be achieved by reduced cost of capital of the merged firm, e.g., through tax benefits or improved leverage (Chatterjee, 1986; Homberg *et al.*, 2009). Other potential sources of synergies can be improved economies of scale and/or scope, enhanced efficiency, access to previously closed markets, customers or technologies (Homberg *et al.*, 2009). Financial investor approaches the acquisition more as an investment and are more open to investing in different industries. Strategic investors are said to have many potential advantages compared to financial investors. Mainly, the advantages comprise an already familiar industry, larger potential synergies, potentially better quality of information on the target company (due to industry-specific knowledge) which can potentially lead to better exploitation of information asymmetry. (Healy *et al.*, 1997)

Differences in financing can also be a differing subject for M&As. Cash acquisitions involve the acquired firm's shareholders to be bought out of the investment. Equity acquisitions mean that the shareholders of the acquired company receive a certain amount of the merged firm's stock instead of cash compensation. Cash acquisitions have historically lead to better financial performance in the post-M&A years compared to stock (equity) acquisitions. (M. Rahman & Lambkin, 2015). Other studies have found that cash acquisitions were more beneficial in case of public firms (with larger target companies) and less beneficial in private acquisitions (smaller target firms) (Gomes *et al.*, 2013a).

Geographical aspects can also be taken into account in the classification of M&As. Intercountry M&As refer to transactions which take place in the same region or country, whereas cross-border M&As involve companies in different countries (UNCTAD, 2000b). The most common motive for cross-border acquisitions are market entry, increase in scale and economies of skill (Jagersma, 2005). Acquisitions in other regions where the firm has yet to expand, can have multiple advantages compared to greenfields (recently established affiliates). The firm can potentially save time by not having to build the affiliate from the ground up, achieve better market power, overcome barriers of entry, acquire resources, local knowledge and know-how. (Barkema *et al.*, 1997; Barkema & Vermeulen, 1998; Vermeulen & Barkema, 2001) However, the potential upsides of an acquisition in a new market do not come without risks as takeover premiums typically range between 20-40% (Vermeulen & Barkema, 2001).

There is also a plethora of other ways of differentiating M&As. LBOs (leveraged buy-out) occur when a large part of the acquired firm's equity is bought out via debt, thus, incorporating the leverage effect. The consequence/effect of LBOs on the firm is usually a substantial increase in debt. Typically the sole intent behind LBOs is to achieve large profits in a relatively short time period. (Fox & Marcus, 1992) MBOs (management buy-out) occur when a certain number of investors (also including managers) decide to buy all of the firm's common stock with the intention of taking it private (Lee, 1992). In some studies, hostile and friendly takeovers are differentiated by the aforementioned "strategic" and "financial" investors where friendly transactions involve stock-based compensation ("strategic") and hostile takeovers involve cash payments ("financial") (Healy *et al.*, 1997). Hostile M&As made up only about 5% of total value and 0.2% of total transaction in 1999 (UNCTAD, 2000b).

1.1.2. Motives behind M&As and factors affecting the success of M&As

There are several different factors which affect the success of a transaction. Value creation in an M&A is a complex topic with varying theoretical standpoints and mixed empirical evidence, however, it is clear that there is no single success factor that warrants a satisfactory transaction, but rather a mix of interdependencies of several constructs (Bauer *et al.*, 2018; Bauer & Matzler, 2014; Gomes *et al.*, 2013a). Historically economists have believed takeovers to be somewhat motivated by the desire to improve poorly performing companies, however, empirical evidence supporting this is relatively weak (Agrawal & Jaffe, 2003). Agrawal & Jaffe (2003) found little information that the target firms had poor performance (either operating results or stock returns) before the acquisition. Overall, the significant failure rate among M&As indicates that neither researchers nor practitioners have a deep and thorough understanding of the variables and interrelationships involved in the M&A process (Gomes *et al.*, 2013a). In the following chapter, the author will bring forth what are believed to be the most crucial aspects of a successful takeover.

Relatedness	Experience	Size
Geographical	Research	Strategic/financial
Means of payment	Cultural fit	Other

Figure 3. Success factors affecting the outcome of an M&A transaction.
Source: compiled by the author.

According to Bauer & Matzler (2014) there is no single success factor but a plethora of interdependent factors. Bauer & Matzler (2014) also found that strategic complementarity is crucial for post-merger integration. "The result of strategic complementarity, in combination with cultural fit, give clear evidence that it is not only economies of sameness that foster value creation

in M&As but, moreover, it is economies of fitness that make M&As work" (Bauer & Matzler, 2014, p. 283).

A related acquisition is any transaction that can be considered horizontal or vertical, hence, an unrelated acquisition is any acquisition that cannot be considered as horizontal or vertical (Alhenawi & Krishnaswami, 2015). According to Alhenawi & Krishnaswami (2015), unrelated transactions have been underexplored among researchers compared to horizontal and vertical acquisitions. Somewhat similarly, empirical evidence shows that companies in related acquisitions have substantially greater dollar gains than companies in unrelated transactions (Hitt *et al.*, 1998; Renneboog & Vansteenkiste, 2019; Singh & Montgomery, 1987), partly due to the diversification of products which potentially reduce systematic risk (Salter & Weinhold, 1978). Rumelt (1974) has classified related businesses to (1) serve similar markets and use analogous distribution channels, (2) use similar production technologies, or (3) conduct similar scientific research. Although relatedness in and of itself can comprise business, cultural, technological, and size, the direct effect of these sources of synergies is still unclear. Hence, it might help giving an explanation as to why some authors find strong positive links between relatedness and the success/profitability of M&As (Flanagan, 1996; Healy *et al.*, 1997; Hitt *et al.*, 1998; Homberg *et al.*, 2009; Morck *et al.*, 1989; Singh & Montgomery, 1987), whereas others observe the opposite (Hambrick & Cannella, 1993; Limmack & Mcgregor, 1995; Sudarsanam *et al.*, 1996). Relatedness can be used synonymously for whether the acquisition was friendly or hostile. Friendly (or "strategic") acquisitions often have stock-based compensation, whereas hostile (or "financial") transactions are more associated with cash-based deals (Healy *et al.*, 1997; Yook, 2003). Interestingly, it has been noted and is generally accepted that strategic acquisitions tend to deliver better results for the acquirer vis-à-vis financial deals, although, many studies have also found that cash ("financial") transactions offer better returns than equity-financed ("strategic") deals which adds a further layer of inconsistencies to the study of M&As.

It is of little surprise that the likelihood of a successful M&A is directly related to past experience in transactions space for the acquiring firm (Collins *et al.*, 2009; Hu *et al.*, 2020). In fact, Hu *et al.*, (2020) found that a firm which had completed at least 12 transactions, is more likely to lead to a completion of the M&A deal. Also, more experienced firms in mega-deals generate positive abnormal stock returns for shareholders in both the short (at announcement) and long-term. The average dollar value gain around the deal announcement has been found to be over 50+ USDm. (Hu *et al.*, 2020) Another study also found that companies which had prior experience with

acquisitions were more likely to do both domestic and cross-border acquisitions. Additionally, the same study found that prior experience specifically in international transactions increased the likelihood of future acquisitions by the firm. (Collins *et al.*, 2009) On the other hand, experience in M&As (and the higher likelihood of a transaction according to Collins *et al.*, (2009) and Hu *et al.* (2020)) might not be a positive aspect after all. Many studies (Ahern, 2010; Aktas, 2009; Antoniou *et al.*, 2007; Conn *et al.*, 2005; Croci & Petmezas, 2009; Fuller *et al.*, 2002; Ismail, 2008; Laamanen & Keil, 2008; Renneboog & Vansteenkiste, 2019) have found the performance of frequently (or serially) acquiring companies typically show a downward trend from transaction to transaction, meaning that with each subsequent deal, the performance declines. However, it must be said that the definitions on experience and serial acquirer may vary significantly between studies. Renneboog & Vansteenkiste (2019) investigated multiple studies on the matter and found that 14 out of 17 short-run studies found negative or declining cumulative abnormal returns (CARs) and 7 out of 9 long-run studies found negative or declining CARs.

Evidence suggests that mega-M&A deals (500+ USDm) are deeply value-destroying to the acquirers shareholders (Hu *et al.*, 2020). Multiple studies indicate that firms are better off doing many smaller acquisitions rather than a few large ones (Guo & Petmezas, 2012). Filipović (2012) found that the relative size of the target compared to the acquirer played a significant role in whether the M&A was a success. Apparently, the smaller the relative size ratio, the more successful the target firm's performance after the takeover is (Filipović, 2012).

Fundamentally, the motives for cross-border (or geographically different) acquisitions is the same as for any other transaction (Barkema *et al.*, 1997; Barkema & Vermeulen, 1998; Erel *et al.*, 2012; Jagersma, 2005; UNCTAD, 2000a; Vermeulen & Barkema, 2001). Large distances between two merging firms and national borders add additional friction to an already difficult task (Erel *et al.*, 2012; Renneboog & Vansteenkiste, 2019). Geographical distance and border crossing clearly affect the number of mergers. *Ceteris paribus*, the shorter the distance between two countries, the more likely a transaction is to happen. Same can be said about countries which are frequent trade partners as the firms are more likely to generate synergies between each other. (Erel *et al.*, 2012). The acquirer in a cross-border acquisition is likely to be from a developed country with higher accounting standards and also higher tax rates (Erel *et al.*, 2012). Uysal *et al.* (2008) found that announcement returns were higher when the target was located geographically closer. That being said, Mayer-Sommer *et al.* (2006) found that in the case of the financial sector, mergers seldom

enhanced returns, regardless of whether the transaction deepens the market penetration or expands the current geographical reach.

Due diligence of any sort plays a crucial role in a successful M&A. It has been widely documented that acquiring firms that have delved into an extensive due diligence process, have outperformed companies which have neglected the thorough analysis. (Angwin, 2001; Denison & Ko, 2016; Harvey & Lusch, 1995; Hitt *et al.*, 1998; Kissin & Herrera, 1990; Wangerin, 2019) Hitt *et al.* (1998) found that lack of or inadequate evaluation of the Target was a significant factor in 11 of the 12 M&As with unsatisfactory outcomes. Whereas financial, legal and other types of due diligence have been relatively popular for decades, acquirers have started to increasingly also focus on cultural differences among the companies. According to Davidson (1988) and Harvey & Lusch (1995), many firms found that the cost of the acquisition was not only the amount what was paid for the target, but rather, also the prevailing costs post-acquisition to remedy problems which were not uncovered during the M&A process, thus, due diligence of all kinds are becoming more prevalent as acquirers have understood the importance of the post-acquisition phase.

M&As (especially larger ones) require significant funds and financing. Typically M&As are paid for with cash, equity or a mix of those (M. Rahman & Lambkin, 2015; Renneboog & Vansteenkiste, 2019). The pecking order theory and related studies suggest that equity-financed transactions should provide the acquirers lower returns vis-à-vis cash-financed deals. The idea behind the theories is that with equity-financed deals, the management of the acquirers indicates to the market that the firm's equity is overvalued. (Loughran & Vijh, 1997; Majluf & Myers, 1984; Mitchell & Stafford, 2000; Renneboog & Vansteenkiste, 2019) For example, to back the theory, Martynova *et al.*, (2006) found that the long-term operating results of the acquirers' increased by 1% in case of cash acquisitions and decreased by 1.2% and 1.9% for equity and mixed transactions, respectively. Fischer (2017) similarly discovered that in the short-run, acquisitions with more credit-financed funding tend to deliver superior performance. Fischer (2017) also noted that over a long-term period, equity financed acquirers underperformed significantly in the years following the acquisition. André *et al.* (2004) and Rahman & Lambkin (2015) similarly found that equity-financed deals underperformed. However, as with many other topics concerning M&As, there are a lot of inconsistencies regarding how and whether the method of payment for the acquisitions impacts the success of said transaction. In contrast, multiple studies have found no statistical significance on how the performance of cash, equity and mixed deals impact the success of the acquirer (Boateng & Bi, 2014; Heron & Lie, 2002; Mushidzhi & Ward, 2004; Yook, 2003).

The literature on the effect of corporate culture on a deal's success is relatively scarce as it is difficult to empirically measure (Renneboog & Vansteenkiste, 2019). Nonetheless, many researchers agree that the personal, interpersonal, group and intergroup dynamics and additional costs that emerge during the merging process of two firms, are significant determinants of whether the acquisition is a success or failure (Angwin, 2001; Bauer & Matzler, 2014; Buono & Nurick, 1992; Denison & Ko, 2016; Erel *et al.*, 2012; Renneboog & Vansteenkiste, 2019). The consequence of M&As can often be lowered employee commitment and productivity, increased dissatisfaction, high employee turnover, power and leadership struggles and a general rise in dysfunctional behaviours such as sabotage (Buono & Nurick, 1992). Angwin (2001) and Bauer & Matzler (2014) found that cultural differences play an integral part in whether the acquirer will go through with the transaction or not.

The debt level present in the acquisition plays a large role in the success probability of the acquisition. A study made by Hitt *et al.* (1998) found that in 21 of the 24 acquisitions, debt level played an integral part in the success (low to moderate debt) or lack of success (high or extraordinary debt).

1.2. Overview of empirical studies

As M&As are gaining popularity among companies and the funds spent on acquisitions have increased manyfold over the last decades, the topic has attracted many scholars to try and figure out the formula behind a successful transaction (Finkelstein & Cooper, 2018; *Number of M&A Deals Globally 1985-2021*, 2021). Although plenty of scholars have tried to explore and explain the topic, no consensus has been reached. Not only has there been no consensus regarding the results, the methodologies, dependent and independent variables are also up for debate. Overall, the evidence and results from M&A literature is highly inconsistent (Aggarwal & Garg, 2019; Finkelstein & Cooper, 2018; Renneboog & Vansteenkiste, 2019). For example, multiple studies (Aggarwal & Garg, 2019; Fernández *et al.*, 2018; Healy *et al.*, 1997; Rani *et al.*, 2013; Wu *et al.*, 2020) have found that profitability saw an increase in the post-acquisition periods, while others (Akben Selcuk & Altiok-Yilmaz, 2021; André *et al.*, 2004; Borodin *et al.*, 2020; Grigorieva & Petrunina, 2015; Muhammad *et al.*, 2019; Pazarskis *et al.*, 2006; Zaremba & Płotnicki, 2014) found the opposite evidence. Some scholars have even said "it is possible, judging from the

available evidence on the effects of mergers, that the US economy would be as or even more efficient today, if there had been no mergers over the last 50 years" (Mueller, 1997, p. 680) and that "M&As are value-destroying deals for the combined firms" (Grigorieva & Petrunina, 2015, p. 377). Additionally, there have been a plethora of studies which found statistically insignificant results, meaning that M&As had no effect on profitability whatsoever (Pervan *et al.*, 2015; Zollo & Meier, 2008). The significant failure rate among M&As (Akben Selcuk & Altiok-Yilmaz, 2021; André *et al.*, 2004; Borodin *et al.*, 2020; Cartwright & Schoenberg, 2006; Gomes *et al.*, 2013b; Grigorieva & Petrunina, 2015; Mayer-Sommer *et al.*, 2006; Muhammad *et al.*, 2019; Pazarskis *et al.*, 2006; Schoenberg, 2006; Zaremba & Płotnicki, 2014) indicates that neither researchers nor practitioners have a deep and thorough understanding of the variables and interrelationships involved in the M&A process. In the following chapter, the author will bring forth most relevant studies aligning with the current thesis.

The author of the thesis identified one previous master's thesis from Estonia on a similar subject, eight articles which used data from the US or Europe and ten articles from the rest of the world. The previously done research was studied with the purpose of getting a better overview of the subject and to map most common methodologies for the empirical part of the thesis.

1.2.1. Empirical studies on M&As done in Estonia

The most recent paper (from Estonia) found by the author was done in 2018 at Tallinn University of Technology as a master's thesis. Nurk (2018) investigated the profitability of mergers in Estonia with EBIT margin being the dependent variable. The author used the ordinary least squared (OLS) method alongside with statistical package Gretl. The thesis did not find a statistical significance on profitability. Nurk (2018) figured that the statistical insignificance can partly be explained by the fact that most acquisitions had a relatively small target size, meaning that the target could not have a significant impact on the profitability of the acquirer. Although, the author did not present this as a potential explanation, the author believes that the relatively small number of transactions used in the study (24) can potentially be misleading due to the number of transactions not amounting to a large sample size.

1.2.2. Empirical studies on M&As done in Europe and the United States

The author studied eight research papers with US and Europe data more closely. Three articles used the ACAR (average cumulative abnormal returns or the cumulative average residual) method in which stock price movements are analysed to research the impact of M&As on shareholder returns (or profitability for the shareholder). Four articles used accounting-based information via paired-sample T tests comparing either the acquirer's financials pre- and post-M&A or the acquirers with the industry averages. In some cases, OLS regression analysis has also been used. In one article, the authors used management questionnaires to estimate the impact of acquisitions on the acquirers. For a more detailed overview of the studies, please refer to Appendix 2.

Seth (1990), Zaremba & Płotnicki (2014) and Chatterjee (1986) used the average cumulative abnormal returns method for analysing M&As. Seth (1990) used US companies data from 1962-1979 (assets > \$10m) and found that value is created from M&As. Zaremba & Płotnicki (2014) used data from 109 companies in CEE from 2001 to 2014. In the short-term, positive and significant abnormal returns were identified for both the targets and the acquirers, however, in the long-term, acquirers had significant negative abnormal returns. Chatterjee (1986) found that both acquirers and targets showed abnormal returns during the 5-day period surrounding the acquisition, meaning that M&As significantly impact the shareholder returns of both companies.

Borodin *et al.* (2020), Pazarskis *et al.* (2006) and Pervan *et al.* (2015) used paired-samples T test in their research. Borodin *et al.* (2020) used 138 companies from US and Europe between 2016 and 2018 and found that EBIT margins decreased for both regions (US and Europe), however, the results were statistically insignificant. Pazarskis *et al.* (2006) used data on 50 listed companies on the Athens Stock Exchange. Pazarskis *et al.* (2006) found that profitability and solvency of the acquirer decreased significantly post-M&A while liquidity showed no statistically significant changes. Pervan *et al.* (2015) found that in the case of 116 Croatian companies (2008-2011), ROA, ROE and profit margin had statistically insignificant differences pre- and post-M&A both in comparison with the sample's historicals and vis-à-vis the peer group companies.

1.2.3. Empirical studies on M&As done elsewhere

The author also studied ten research papers where data used was not from Estonia, US nor Europe. Two articles used the ACAR (average cumulative abnormal returns or the cumulative average

residual) method in which stock price movements are analysed to research the impact of M&As on shareholder returns (or profitability for the shareholder). Five articles used accounting-based information via paired-sample T tests comparing either the acquirer's financials pre- and post-M&A or the acquirer's with the industry averages. Regression analysis has been used in five articles. In a couple of articles multiple methods have been used. For example, Muhammad *et al.* (2019) used paired-samples T test and OLS, Akben Selcuk & Altiok-Yilmaz (2021) used ACAR and paired-sample T tests, Grigorieva & Petrunina (2015) used regression analysis and economic profit models. For a more detailed overview of the studies, please refer to Appendix 3.

Purely ACAR was used only by Kinateder *et al.* (2017). Using a sample of 50 listed companies from BRICS (Brazil, Russia, India, China, and South Africa) countries between 2006-2015, they found that targets earn significant positive announcement returns, while acquirers lose slightly.

Paired-samples T tests were used by Aggarwal & Garg (2019), Rani *et al.* (2013) and Yeh & Hoshino (2002). Aggarwal & Garg (2019) used data from 68 acquisitions from India (2007-2012) and found that M&As provide positive results and improve accounting and financial position of a firm in the long-term. Similarly to Aggarwal & Garg (2019), Rani *et al.* (2013) also used data from India (383 acquisitions between 2003-2008) and identified similar results (improvement in cash flows and increase in long-term operating margins).

Regression models were used by Bertrand & Betschinger (2012), Rahman & Limmack (2004), Sharma & Ho (2002). Bertrand & Betschinger (2012) investigated 609 acquisitions from Russia (1999-2008) and found that both domestic and international acquisitions led to reduced performance compared to non-acquiring firms. Using data on 94 listed acquiring companies from Malaysia, Rahman & Limmack (2004) found that operating cash flow (OCF) improved significantly, both due to increased asset productivity and higher OCF margins. Sharma & Ho (2002) used information on 36 acquisitions from Australia (1986-1991) and found that corporate acquisitions do not lead to significant post-M&A improvements in operating performance.

Using information on 80 acquisitions from Asia, CEE and South America (2003-2009), Grigorieva & Petrunina (2015) used both regression analysis and economic profit model and arrived at the conclusion that M&As are value-destroying. More specifically, long-term analysis showed negative industry-adjusted differences between pre- and post-acquisition performance measures. Akben Selcuk & Altiok-Yilmaz (2021) researched 62 listed companies from Turkey (2003-2007)

using both ACAR and paired-sample T test. They found that the information weakly supported the hypothesis that acquiring companies are negatively affected by acquisitions. Muhammad *et al.* (2019) investigated 15 banks from Pakistan (2004-2015) using both paired-samples T tests and OLS regression models. They arrived at the conclusion that liquidity and profitability are significantly and positively increased, whereas solvency ratios are negatively affected (mostly due to larger debt to go through with the M&A).

2. DATA AND METHODOLOGY

In the following subchapters, the author will give an overview of the data used in the thesis, the selected sample, composition of the peer group and methodologies used in the analysis.

2.1. Data

Most of the data used in the thesis will be collected from Mergermarket (*Mergermarket*, 2022) and Orbis Europe (*Orbis | Bureau van Dijk*, 2022). Information and data on transactions which have occurred can be obtained on Mergermarket. Mergermarket is an online database which collects information on M&As. Most commonly, Mergermarket has info on the acquirers and targets, however, at times information is also available on the deal value, financial multiples etc. Mergermarket is not free to access (paid subscription), however, the author of the thesis has access to the database through his profession. Once the list of the acquiring companies has been compiled, financials on the acquirers can be accessed from Orbis. Orbis is an online database which collects financial information on close to 400 million companies (both public and private). Financials on peer groups will also be taken from Orbis as it offers extensive information on different sectors.

At first, the author will download information of the deals from Mergermarket during the years 2015-2017. Secondly, financial information for the acquirers will be taken from Orbis which can then be analysed. The approach chosen by the author requires financial information on the acquirer's three years before and after the acquisition to make conclusions on the impact. The period of 2015-2017 was chosen due to data constraints as Orbis only allows to subtract data from 2012 onwards and for most companies, the latest financials are for 2020. As three-year data is required for both pre- and post-M&A, the period 2015-2017 was chosen.

Unfortunately, Mergermarket does not provide the option to search by acquiring company but only by target. As the subject of the thesis is to see the impact of M&As on companies residing in the

Baltic or Scandinavian countries, the author will search for deals done in the region where the acquiring company is from one of the six countries.
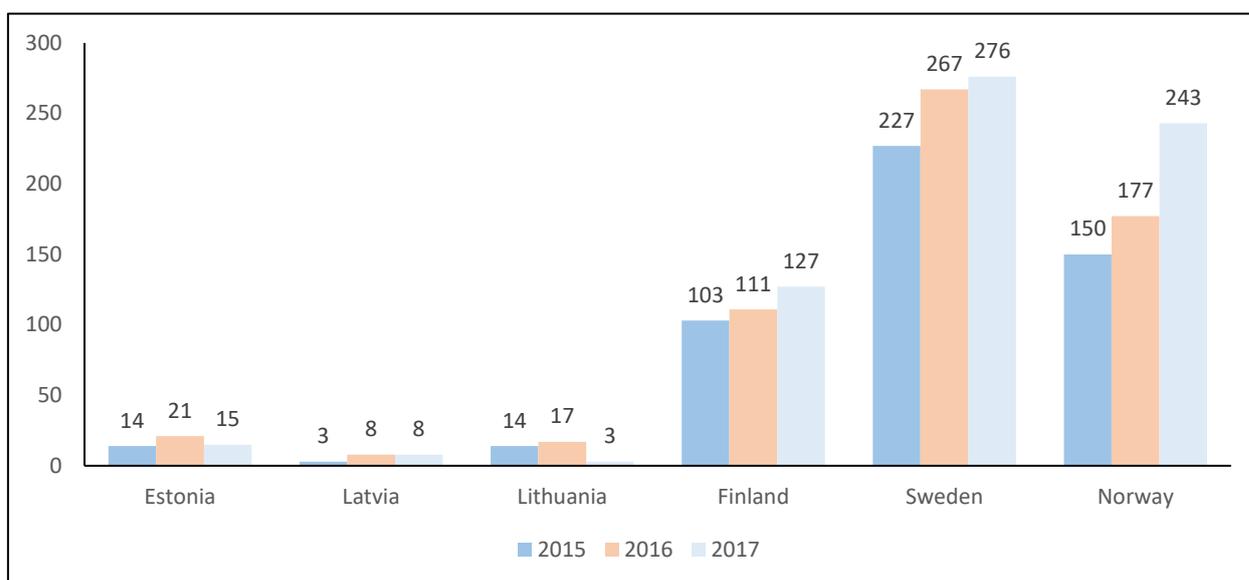
Figure 4. Transactions in the Baltics and Scandinavia during 2015-2017

Source: compiled by the author based on Mergermarket information

In total, 1784 transactions were available on Mergermarket where both the acquirer and the target were either from the Baltic or Scandinavian countries. More information on the breakdown of all acquisitions can be found in Figure 4 and Table 1. Latvia had the least transactions with 19 (1% of total) and Sweden had the most with 770 (43%). Estonia had 50 (3%), Lithuania 34 (2%), Finland 341 (19%) and Norway 570 (32%) transactions. For the three largest countries (Finland, Sweden, and Norway), the number of transactions has increased each observable period. Deals in the Baltic countries make up less than 6% of total number of transactions in the region. 1411 transactions were inter-country, meaning that cross-country transactions only made up 21% of all observable transactions.

Table 1. Descriptive statistics of original sample (before eliminations)

	Estonia	**Latvia**	**Lithuania**	**Finland**	**Sweden**	**Norway**	**Total**	**% of total**
2015	14	3	14	103	227	150	**511**	29%
2016	21	8	17	111	267	177	**601**	34%
2017	15	8	3	127	276	243	**672**	38%
Total	**50**	**19**	**34**	**341**	**770**	**570**	1784	**100%**
% of total	3%	1%	2%	19%	43%	32%	**100%**	-

Source: compiled by the author based on data from Mergermarket

Information on the acquirer's involved in the transactions were searched on Orbis. Of the 1784 acquirers, Orbis has information on 1152 – 30 from Estonia, 10 from Latvia, 27 from Lithuania, 242 from Finland, 463 from Sweden and 380 from Norway. Additionally, the author decided to run a separate test where duplicate acquirers (or "serial acquirers") were eliminated as otherwise the pre-M&A and post-M&A comparable periods for the analysis might disrupt the financial data on the transaction. With the duplicates eliminated, information on 822 acquirers remained – 23 from EE, 8 from LV, 27 from LT, 171 from FI, 324 from SE and 269 from NO. The author also divided the information into groups based on whether the acquisition is domestic (target and bidder companies have same dominant country) or international (Figure 5). The potential issue with dividing the acquisitions based on dominant country is that it is unknown to the author if holding companies (or companies established just for the acquisition) count as dominant countries. Thus, it is possible, that the domestic acquisitions are inflated. The author will also check whether there is a significant difference in variables in case of domestic/international mergers. In total there are 629 domestic acquisitions, 141 international acquisitions and for 52 acquisitions there was not enough information to make the distinction.
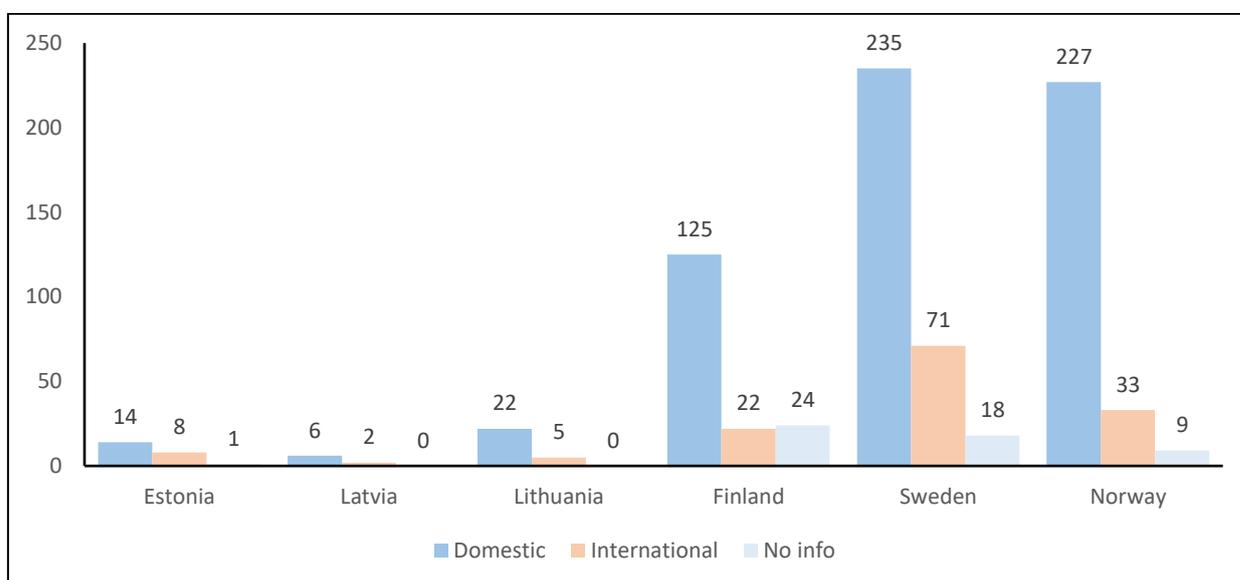
Figure 5. Acquisitions by country and type (domestic/international) in the Baltics and Scandinavia during 2015-2017

Source: compiled by the author based on Mergermarket information

The author of the thesis chose variables for the analysis based on previously studied articles. To check the effect on solvency, the author chose two ratios available from Orbis Europe – solvency

(asset based) and solvency (liabilities based) (Appendix 1). In terms of solvency, it is expected that solvency will decrease as often companies take on external financing to go through with the acquisition. To analyse the effect of M&As on liquidity, current and quick ratio were most used. The author will use current ratio and liquidity ratio (Appendix 1). The main goal of the study is to identify what the impact of acquisitions is on the acquirer's profitability. Most commonly used accounting-based variables were different profitability ratios such as gross profit margin, EBITDA margin, EBIT margin, net income margin, ROE, ROA etc. For the purpose of this thesis, the author chose to look more closely at the impact on EBIT margin, ROE and ROA (Appendix 1). EBIT margin was chosen to see the effect of the acquisition in a broader sense which is not altered by company-specific capital structure and country-specific income taxation. ROE was chosen to see how the acquisition impacts returns for shareholders as larger profits or higher margins may not necessarily translate into better returns for investors. ROA was chosen to analyse whether the new company uses assets more effectively.

For these 822 companies, Orbis data was obtained on Current ratio, Liquidity ratio, Solvency ratio (asset based), Solvency ratio (liquidity based), Return on Assets (ROA), Return on Equity (ROE), EBIT margin (Appendix 1).

Correlation matrix was done for all variables before and after M&A. Correlation is considered to display positive (negative) and strong association when the correlation is greater than or equal to 0.7 (-0.7). When the correlation coefficient for two variables is between -0.7 and 0.7 then there is moderate or weak association between the variables. Table 2 reveals that most variables have a moderate positive correlation. Pre-M&A, current ratio and ROA, liquidity and ROA, Solvency (liability) and EBIT margin show a moderate negative correlation with correlation less than -0.02 for each. Pre-M&A, strong association can be seen with current ratio and liquidity (0.98) and moderate association was identified between solvency (asset) and solvency (liability) (0.65), ROA and ROE (0.66), EBIT and ROE (0.42). Post-M&A, current ratio and solvency (liability), current ratio and ROA, current ratio and EBIT, liquidity and solvency (liability), liquidity and ROA show a negative correlation (less than -0.07 for each). Post-M&A, strong correlation is identified for current ratio and liquidity (0.97), solvency (asset) and solvency (liability) (0.84) and moderate correlation was found between ROA and ROE (0.64), ROE and EBIT (0.44). Strong associations identified for pre-M&A and post-M&A period were between the same groups. For an overview of correlations between the variables pre-M&A and post-M&A, please refer to Appendix 7.

Table 2. Correlation matrix (pre- and post-M&A)

Correlation matrix (before M&A)							
	Current	Liquidity	Solvency (asset)	Solvency (liability)	ROA	ROE	EBIT
Current	1	-	-	-	-	-	-
Liquidity	0.978014	1	-	-	-	-	-
Solvency (asset)	0.390787	0.386413	1	-	-	-	-
Solvency (liability)	0.103086	0.076616	0.650647	1	-	-	-
ROA	-0.019050	-0.016380	0.061043	0.066921	1	-	-
ROE	0.010146	0.018744	0.226961	0.125528	0.664043	1	-
EBIT	0.004483	0.034806	0.121737	-0.008760	0.289053	0.424853	1
Correlation matrix (after M&A)							
	Current	Liquidity	Solvency (asset)	Solvency (liability)	ROA	ROE	EBIT
Current	1	-	-	-	-	-	-
Liquidity	0.972992	1	-	-	-	-	-
Solvency (asset)	0.308836	0.272460	1	-	-	-	-
Solvency (liability)	-0.038320	-0.063240	0.848048	1	-	-	-
ROA	-0.000470	-0.000420	0.087636	0.141620	1	-	-
ROE	0.015951	0.019004	0.279432	0.231082	0.640374	1	-
EBIT	-0.016240	0.053754	0.173797	0.081505	0.239332	0.437162	1

Source: compiled by the author

The financials of the sample will also be compared to peers' financials. Information on peer companies were obtained from Orbis Europe. Ideally, industry performance indicators should be used as a benchmark (Sharma & Ho, 2002). To achieve this, peer companies were selected based on the NACE (Nomenclature of Economic Activities) codes of sample companies. NACE is the official European statistical classification of economic activities for companies operating in the European space. Peer group averages were then compared with the sample. The peer group comprises 60,069 companies from the Baltics and Scandinavia (Figure 6).
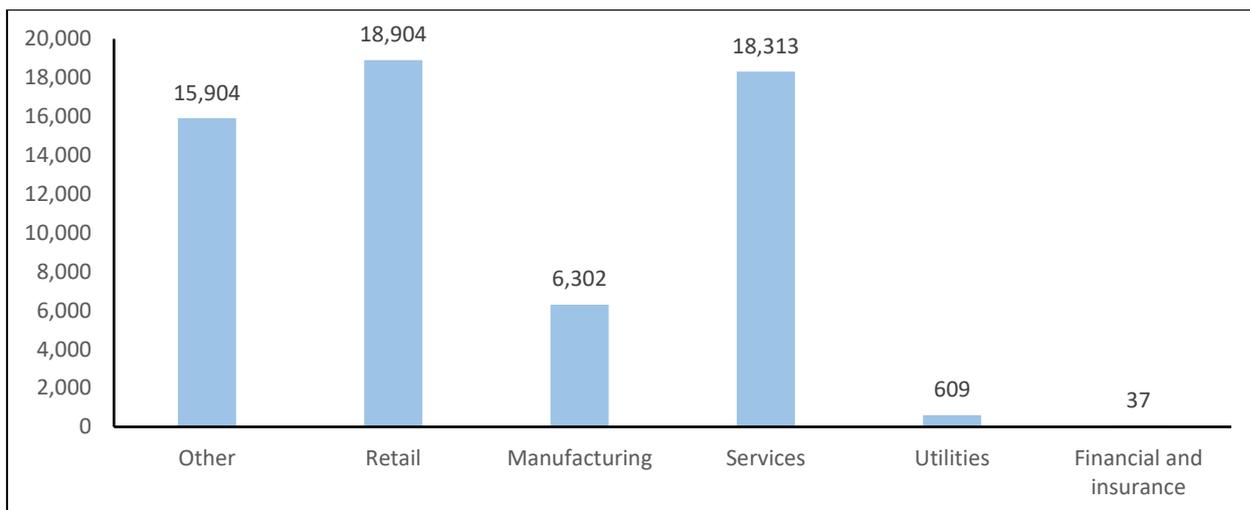
Figure 6: Peer group companies by sector

Source: Orbis Europe

The cut-off point for peer companies was chosen as $200k of revenue. The sample and peer companies were divided into wider sectors – financial and insurance, utilities, retail and wholesale, services, manufacturing and other. Companies were divided into five distinct sectors – retail, manufacturing, services, power & utilities, and financial & insurance services. Companies which did not fit into the aforementioned categories, were added under the 'Other' category (Figure 6). Information on how the NACE codes were divided into the broader groups can be found in Appendix 4.

2.2. Methodology

Scholars have used many methodologies for analysing the effects of M&As on the acquiring company (Das & Kapil, 2012; Meglio & Risberg, 2011). On the international level, event studies dominate the post-acquisition research, while in the Emerging Markets (especially India), the most common practise is using accounting returns and ratios. Other methodologies have also been used (e.g., data envelopment analysis and balanced score card method), however, these are not as popular. (Sethi & Krishnakumar, 2010)

Variables tested in the regression analysis will be financial performance, time, group (acquirers and peer group), industry, type (domestic, international). Industry of the acquirer will be included via dummies for financial sector, services sector, manufacturing, retail, energy sector, and other.

2.2.1. Wilcoxon test for sample comparison analysis

Two-sample Wilcoxon tests will be done to compare the results of acquirers before and after the transactions. Tests will be done to compare the results for three years before and after the transaction. The author calculated the averages and medians of the ratios before and after the transaction. The year of the transactions was not included in any of the calculations. Two-sample T-test was originally also considered by the author, however, Wilcoxon test was chosen instead of the two-sample T-test as the dependent variables are not normally distributed and a non-parametric test is more appropriate for such data. Wilcoxon test was chosen over the Mann-Whitney U-test as the samples are dependent (Mann-Whitney U-test is used for independent samples).

More specifically, the author will use double-difference (also difference-in-difference or "DD") estimation technique, which is mostly used with panel data. With panel data, DD estimation resolves the problem of missing data by measuring covariates and outcomes for both acquirers and non-acquirers in pre- and post-acquisition periods. DD essentially compares the sample with peer group in terms of outcomes and changes over time. For example, in a two-period setting where t = 0 before the treatment (in this case acquisition) and t = 1 after the treatment (acquisition), where Y_t^T and Y_t^C are the impact group and control group in period t, respectively. (Khandker *et al.*, 2009) According to DD, it assesses the impact of the event/program/treatment as follows (Khandker *et al.*, 2009):

$$DD = E(Y_1^T - Y_0^T \mid T_1 = 1) - E(Y_1^C - Y_0^C \mid T_1 = 0) \qquad (1)$$

$$DD = E(Y_1^T - Y_1^C \mid t = 1) - E(Y_0^T - Y_0^C \mid t = 0) \qquad (2)$$

where

$T_1 = 1$ – denotes the treatment or the presence of the program (or in this case, acquisition)

$T_1 = 0$ – denotes the untreated (or in this case, the peer group)

Y – comparable variable

t – time/period (t=0 is pre-acquisition and t=1 is post-acquisition)

E – mean

The heterogeneity of the data can be brought forth using the differences of the treatment group (acquiring companies) and control group (peer group companies). The easiest way to see whether the control group and treatment (acquirers) group have statistically significant differences is to calculate the differences of the groups pre- and post-treatment (acquisition) by using the equation

above (Equation 1). (Khandker *et al.*, 2009) The author has also visualised the logic of the calculation (Figure 7).
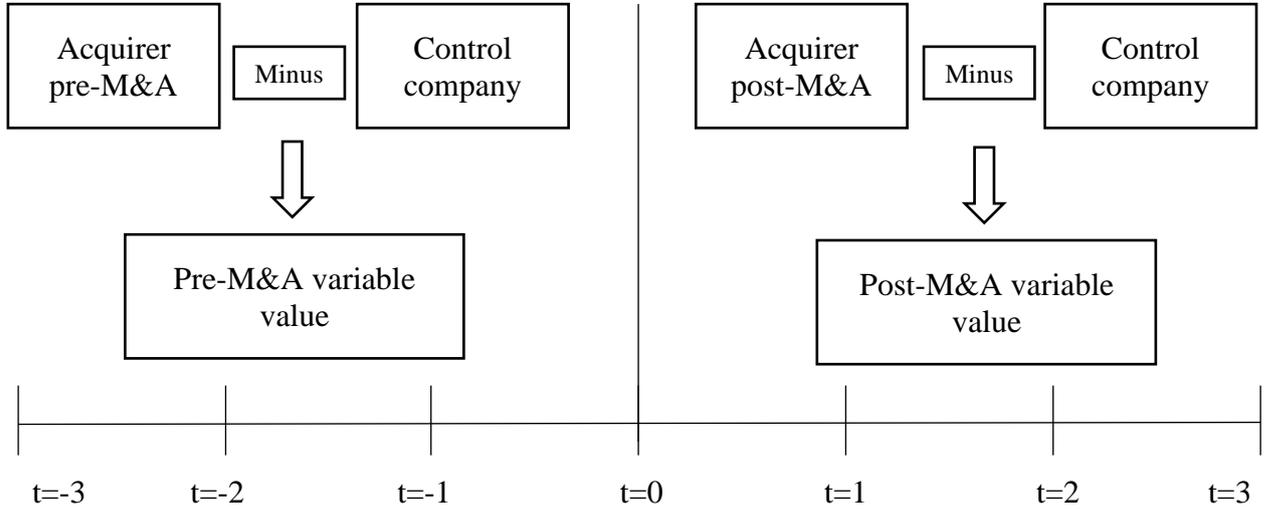
Figure 7. Design/methodology for computation of test variables for comparison with peer group companies

Source: Compiled by author based on example from Sharma & Ho (2002)

The differences approach will be used to analyse whether the two samples have statistically significant differences. This approach will be used for the Wilcoxon tests and also for the short OLS models.

2.2.2. Ordinary least squared (OLS) method

To estimate the effect of acquisitions on the acquirer's profitability, the author will use OLS regression analysis. As mentioned previously, three profitability measures (ROA, ROE and EBIT margin) will be tested with the model. The variables will also be tested for differences pre- and post-acquisition vis-à-vis the sample data and the peer group data (e.g., differences between sample and market EBIT margin before the transaction and after the transaction). The first model employed examines the correlation between the observed financial ratio and the realization of the acquisition. The base form of the model is as follows:

$$Y_{it}^{PostM\&A} = \alpha + \beta_1 X_{it}^{PreM\&A} + \varepsilon \qquad (3)$$

$$YD_{it}^{PostM\&A} = \alpha + \beta_1 XD_{it}^{PreM\&A} + \varepsilon \qquad (4)$$

where

Y_{it} – dependent variable (ROA, ROE and operating (EBIT) margin or differences of the variables between sample and market data after the acquisition),

YD_{it} – dependent variable (differences of the variables (ROA, ROE and operating (EBIT) margin) between sample and market data after the acquisition),

α – intercept,

β_1 – independent variable estimation parameter,

X_{it} – independent variable (ROA, ROE and operating (EBIT) margin or differences of the variables between sample and market data before the acquisition),

XD_{it} – dependent variable (differences of the variables (ROA, ROE and operating (EBIT) margin) between sample and market data before the acquisition),

ε – zero mean disturbance term,

i – company index,

t – time index.

A statistically significant parameter for the pre-M&A figure is to be expected. However, the main focus in case of the short OLS model is the intercept parameter and its statistical significance. A statistically significant intercept indicates that the pre- and post-M&A period differ significantly, which might indicate that the M&A had substantial impact on the financials. Same approach will also be used for the analysis against the peer group using Equation 1 (and figure 7).

2.2.3. Difference-in-difference ordinary least squares method

The following regression is similar in logic as Equation 1 and Equation 2. It is the double difference (or difference-in-difference) regression model form. The author will also use this approach to show the effect of M&As on the acquirer's profitability. It is possible to show the impact using the following regression model (Khandker *et al.*, 2009):

$$Y_i = \alpha + \theta I_a T + \beta I_a + \gamma T + \varepsilon_a \qquad (5)$$

where

Y_{it} – dependent variable (ROA, ROE or operating (EBIT) margin),

α – intercept,

θ – event and time coefficient estimation parameter, DD (from Equation 1 and Equation 2),

I_a – influence parameter, influenced group dummy variable (I = 1 if acquiring company),

T – time/period dummy variable (T=1 if post-acquisition),

β – independent variable estimation parameter,

γ – independent variable estimation parameter,

ε – zero mean disturbance term,

i – company index.

The author will also add additional variables to the base model to take into account the effects on whether the acquisition was domestic/international and what sector the acquirer operates in. The type of acquisition (domestic/international) was assumed based on data from Mergermarket. Mergermarket has the option to download data on the acquirer's and target's dominant country. If the two countries matched, the author assumed the acquisitions to be domestic. The following model was used (more detailed version in Appendix 5)

$$Y_{it} = \alpha + \theta I_a T + \gamma_1 I_a + \gamma_2 T + \gamma_3 S_1 + \gamma_4 S_2 + \gamma_5 S_3 + \gamma_6 S_4 + \gamma_7 S_5 + \gamma_8 S_6 \qquad (6)$$
$$+ \gamma_9 D + \varepsilon_a$$

where

Y_{it} – dependent variable (ROA, ROE and operating (EBIT) margin),

α – intercept,

θ – event and time coefficient estimation parameter, DD (from Equation 1 and Equation 2),

I_a – dummy variable for influenced group (acquiring companies),

T – dummy variable for time/period (post-acquisition period),

γ_1-γ_9 – independent variable parameter (dummy),

S_1-S_6 – independent dummy variable, which is equal to 1 if the acquirer is mainly active in a certain sector, otherwise the value is 0,

D – independent dummy variable, which is equal to 1 if the acquisition was domestic, otherwise (international acquisition) the value is 0,

ε – zero mean disturbance term,

i – company index,

t – time index.

Using the model for estimating the intercept, one of the dummy variables (sector) should be taken out. The author will leave out S_1 (retail sector) from the regression model to estimate the impact of other dummy variables on the intercept. Results of the models are presented in the following chapter.

3. RESULTS AND CONCLUSIONS

3.1. General overview of data with preliminary analysis

Research on profitability of M&As is highly debated and a heated topic among researchers. Results of studies are far from certain and do not provide concrete answers on the impacts (Annex 2 and Annex 3). In the following chapter, the author will provide results of the analysis on how and if transactions impact the acquiring company.

Table 2. Summary statistics on financial ratios

Variable	Increased post-M&A	Decreased post-M&A	N/A values
Current ratio	232	321	269
Liquidity ratio	232	317	273
Solvency (asset based)	281	293	248
Solvency (liability based)	177	184	461
ROA	257	300	265
ROE	263	310	249
EBIT	221	276	325

Source: compiled by the author

In case of all variables, more companies saw a decrease for the variables post-M&A vis-à-vis pre-M&A. In case of solvency (asset based) and solvency (liability based), the number of firms for which the ratio increased and decreased are relatively similar. For other variables, the firms for which the variable decreased outweighs the increased ones substantially. The decreasing figures (both Table 2 and Table 3) might not necessarily be that telling for the current ratio and liquidity ratio as the decrease of these ratios can be indicators of better, more efficient working capital management. In Table 3, the summary statistics indicate the comparison of all variables and financial ratios before and after M&A. The mean and median values for each of the variables decreased in the post-M&A period vis-à-vis pre-M&A.

Table 3. Summary statistics (pre- and post-M&A based on sample data)

	Current	Liquidity	Solvency (asset)	Solvency (liability)	ROA	ROE	EBIT
Sample							
Summary statistics (before M&A)							
Mean	3.100	2.655	42.273	48.523	5.948	10.416	7.135
Median	1.413	1.092	39.581	49.028	5.347	13.727	5.120
Maximum	67.319	67.319	100.000	99.801	87.697	482.595	99.324
Minimum	0.000	0.000	-80.000	0.047	-96.296	-900.000	-88.020
Skewness	5.539	5.988	0.146	0.101	-0.562	-4.327	0.124
Kurtosis	39.123	45.049	3.377	2.084	11.206	45.554	9.356
Summary statistics (after M&A)							
Mean	2.954	2.486	40.914	47.051	4.947	9.178	6.321
Median	1.297	1.029	38.085	45.626	4.346	12.262	4.230
Maximum	72.959	72.222	100.000	99.793	82.482	345.439	99.576
Minimum	0.005	0.005	-65.034	0.030	-87.118	-639.170	-90.909
Skewness	6.110	6.226	0.186	0.088	0.229	-3.198	0.366
Kurtosis	46.289	47.795	3.541	2.102	12.749	34.066	9.053

Source: compiled by author

In addition to all the variables decreasing by company (Table 2), same can be seen in the summary statistics table (Table 3, Appendix 6, and Figure 8) for the mean and median values. Decrease in solvency might indicate that the acquirer took on debt to go through with the acquisition. Both ROA and ROE decreased by more than 1 pp during the observable period. EBIT also decreased by roughly 1 pp.
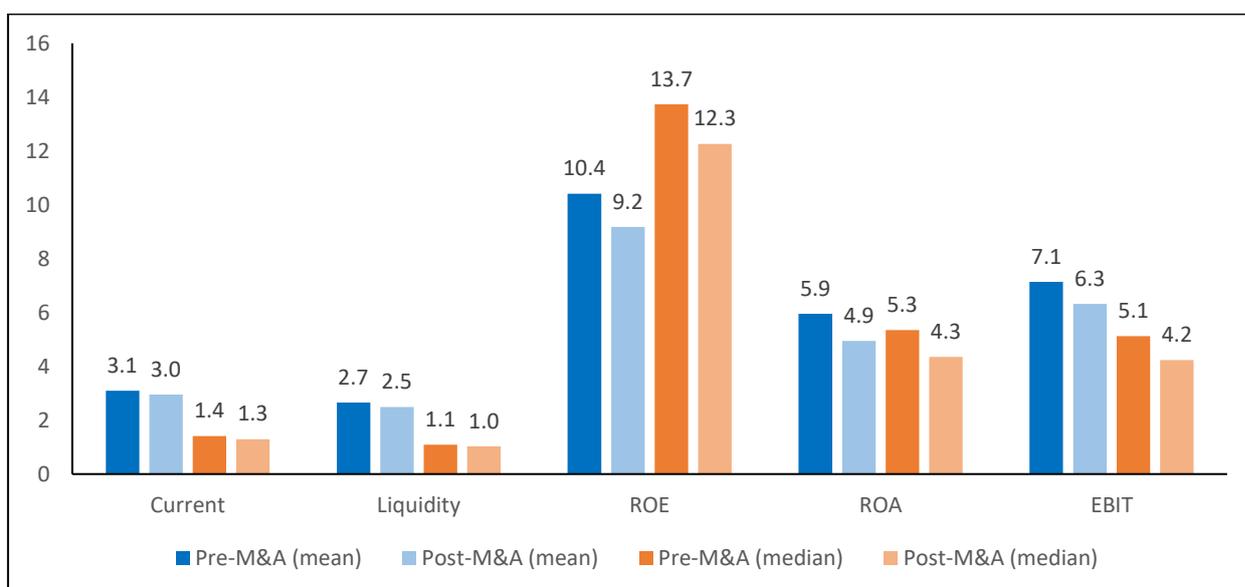
Figure 8. Mean and median values of the sample pre-M&A and post-M&A (Solvency values were excluded from the figure for optimal visualisation purposes)

Source: compiled by the author based on data from Mergermarket and Orbis Europe

Part of the decrease in financial ratios and margin might be explained by additional post-acquisition integration related processes. Potentially the acquisition can be burdensome both financially and in terms of workforce resources as employees may have to allocate additional time to the integration process, meaning that their daily tasks might be left without attention resulting in lower margins. It must be checked, however, whether the difference is statistically significant and whether overall market margins have similarly decreased to make further conclusions.

3.2. Results of Wilcoxon test for sample comparison analysis

Comparisons between the two periods (pre- and post-acquisition) were done with Wilcoxon sign tests. Wilcoxon test was chosen over the Student T-test as the variables in the sample did not have a normal distribution and had numerous outliers in which case a nonparametric test is preferrable. Two-sample Wilcoxon tests were done for each of the seven variables (both based on mean and median values). In case of the whole sample (mean values), two out of seven variables (ROE, EBIT) were statistically significant ($p<0.05$) pre- and post-M&A. Three of the seven variables – current ratio, liquidity ratio, ROA – were statistically significant on a 1% ($p<0.01$) level. In case of median values for the whole sample, two variables (ROA, ROE) were statistically significant ($p<0.05$) in comparison of pre- and post-M&A figures. EBIT margin was significant on a 10% level, while current ratio and liquidity ratio were significant on a 1% level.

Table 4. Wilcoxon test results based on sample historicals (pre- and post-M&A)

Wilcoxon test based on mean values			
Variable	**Sample size**	**W-value**	**P-value**
Current ratio	553	76,591	0.000 ***
Liquidity	549	75,488	0.000 ***
Solvency (asset based)	574	82,513	0.235
Solvency (liability based)	361	32,671	0.590
ROE	573	82,226	0.011 **
ROA	557	77,702	0.006 ***
EBIT	497	61,877	0.017 **
Wilcoxon test based on median values			
Variable	**Sample size**	**W-value**	**P-value**
Current ratio	553	76,591	0.000 ***
Liquidity	547	75,486	0.000 ***
Solvency (asset based)	573	82,512	0.273
Solvency (liability based)	361	32,671	0.807
ROE	573	82,226	0.018 **
ROA	557	77,702	0.016 **
EBIT	497	61,877	0.069 *

Source: compiled by the author
Notes: Significance levels: * 0.1; ** 0.05; ***0.01.

Table 4 is representative of only the sample data and does not take into account the overall market movements (peer group), thus, a similar analysis was done in comparison to the peer companies. For the peer group analysis, Equation 1 (and figure 7) from chapter 2.2.1 was used. The author calculated the differences in the variables pre-acquisition (variable value pre-acquisition for the sample minus variable values pre-acquisition for the peer companies) and post-acquisition (variable value post-acquisition for the sample minus variable values post-acquisition for the peer companies) to see the effect of acquisition relative to the market. Essentially the author analyses whether the differences have changed. A statistically significant p-value indicates that the differences between the sample and peer group changed significantly pre- and post-M&A. Peer group data was calculated for 2015-2017 similarly as for sample companies (three-year averages/median for each year). Peer group was divided into sectors (Figure 6) based on the respective NACE codes to assure that each company is compared with its industry. Mean and median values for variables were calculated based on sectors for each of the years (2015-2017). Market comparison for each sample company was taken based on the respective sector and acquisition year.

Table 5. Wilcoxon test results – comparison of sample and peer group (pre- and post-M&A)

Wilcoxon test based on mean values				
Variable	**Sample size**	**W-value**	**P-value**	
Current ratio	508	64,643	0.000	***
Liquidity	505	63,883	0.000	***
Solvency (asset based)	513	65,921	0.000	***
Solvency (liability based)	340	28,985	0.152	
ROE	512	65,664	0.000	***
ROA	497	61,877	0.001	***
EBIT	463	53,708	0.002	***
Wilcoxon test based on median values				
Variable	**Sample size**	**W-value**	**P-value**	
Current ratio	508	64,643	0.000	***
Liquidity	505	63,883	0.000	***
Solvency (asset based)	513	65,921	0.000	***
Solvency (liability based)	340	28,985	0.091	*
ROE	512	65,664	0.000	***
ROA	497	61,877	0.000	***
EBIT	463	53,708	0.016	**

Source: compiled by the author
Notes: Significance levels: * 0.1; ** 0.05; ***0.01.

Table 5 is representative of the Wilcoxon test results where the sample data (acquiring companies) are compared with the peer group companies' figures. Based on mean values, six of the seven variables (current ratio, liquidity ratio, solvency (asset based), ROA, ROE, EBIT margin) were statistically significant ($p<0.01$) on a 1% level. Liabilities based solvency was the sole variable which did not result in a statistically significant p-value. Based on median values, five of the seven variables (current ratio, liquidity ratio, solvency (asset based), ROA and ROE) were statistically significant on a 1% level ($p<0.01$). Liabilities based solvency and EBIT margin were significant on a 10% and 5% level, respectively. Wilcoxon tests were done for all countries and industries separately. The results of the tests are shown in Appendixes 18-38.

3.3. Results of regression models

3.3.1. Results of the simple ordinary least squared (OLS) model

In addition to Wilcoxon tests, the author also used ordinary least squares (OLS) regression analysis to identify whether acquisitions impact the post-acquisition profitability figures. The author used ROA, ROE and EBIT margin for the analysis of profitability. Firstly, results from Equation 4 and

Equation 5 will be presented to check whether based on the regression models, it can be concluded that M&As have a significant impact on the profitability figures.

Table 6. Regression analysis results on EBIT for comparison with sample historicals and peer group companies

	Against sample historical figures	Against peer group figures
	(1) Simple OLS	(2) Simple OLS
Dependent variable	Post-acquisition EBIT margin	Post-acquisition EBIT margin diff
Constant	1.1722 (0.8989)	-1.3996 ** (0.6419)
Pre-acquisition EBIT margin / EBIT margin difference	0.7127 *** (0.0698)	0.7284 *** (0.0777)
R-squared	0.4960	0.4971
Adjusted R-squared	0.4949	0.4961
P-value	0.0000 ***	0.0000 ***
Observations	497	463

Source: compiled by the author
Notes:
1. Standard deviations in parenthesis.
2. Significance levels: * 0.1; ** 0.05; ***0.01.

As can be seen in Table 6, the intercept for EBIT margin compared to the sample historicals (left model) is not statistically significant ($p>0.05$), meaning that M&As do not have a significant effect on the post-M&A period vis-à-vis pre-M&A. However, interestingly enough, the basic regression model provides a different result than the Wilcoxon test which showed that the two periods had significant differences. The difference in results might be explained by the differences in how the tests are done. The model does show that pre-M&A EBIT margin is statistically significant ($p<0.05$) and explains the post-acquisition EBIT margin, which was expected. Assuming a 10% pre-acquisition EBIT margin for company i, the post-acquisition EBIT margin would be 1.172+0.713*10 = 8.3% (based on the model on the left). For testing in comparison to the peer group companies, the author used differences in the company and peer group values pre- and post-acquisition. The regression using peer group data (right model) resulted in a statistically significant intercept ($p<0.05$), meaning that compared to control firms, the sample companies were significantly affected by the M&A. The EBIT margin differences are calculated by sample minus peer group. Thus, assuming that the pre-acquisition difference between the company i and peer group was 0, after the acquisition, the company i would have an EBIT margin 1.4% (model on the right) lower than the peer group companies (difference between sample and peer group companies is -1.4%). Both models on EBIT had adjusted R-squared between 0.49 and 0.5 and had p-values

significant on a 5% level. OLS with robust standard errors were used in both model as heteroskedasticity was present in both cases. Models without robust standard errors with Breusch-Pagan and White tests are presented in Appendix 8.

Table 7. Regression analysis results on ROA for comparison with sample historicals and peer group companies

	Against sample historical figures	Against peer group figures
	(1) Simple OLS	(2) Simple OLS
Dependent variable	Post-acquisition ROA margin	Post-acquisition ROA margin diff
Constant	2.9190 *** (0.6026)	-5.1193 *** (0.5392)
Pre-acquisition ROA margin / ROA margin difference	0.3760 *** (0.0581)	0.3883 *** (0.0601)
R-squared	0.2150	0.2427
Adjusted R-squared	0.2136	0.2412
P-value	0.0000 ***	0.0000 ***
Observations	573	512

Source: compiled by the author
Notes:
1. Standard deviations in parenthesis.
2. Significance levels: * 0.1; ** 0.05; ***0.01.

As can be seen in Table 7, the intercept for ROA compared to both the sample historicals (left model) and peer group (right model) are statistically significant, meaning that M&As do have a significant effect on the post-M&A period vis-à-vis pre-M&A. This was also confirmed by the Wilcoxon tests. Assuming a 10% pre-acquisition ROA margin for company i, the post-acquisition EBIT margin would be 2.979+0.376*10 = 6.7% (based on the model on the left). For testing in comparison to the peer group companies, the author used differences in the company and peer group values pre- and post-acquisition. The ROA margin differences are calculated by sample minus peer group. Thus, assuming that the pre-acquisition difference between the company i and peer group was 0, after the acquisition, the company i would have an ROA margin 5.1% (model on the right) lower than the peer group companies (difference between sample and peer group companies is -5.1%). For both models, the independent variable (pre-M&A value) was statistically significant on a 5% level. Both models were statistically significant on a 5% level. Adjusted R-squared for the sample and peer group models were 0.214 and 0.241, respectively. OLS with robust standard errors were used in both model as heteroskedasticity was present in both cases. Models without robust standard errors with Breusch-Pagan and White tests are presented in Appendix 9.

Table 8. Regression analysis results on ROE for comparison with sample historicals and peer group companies

	Against sample historical figures		Against peer group figures	
	(1) Simple OLS		(2) Simple OLS	
Dependent variable	Post-acquisition ROE margin		Post-acquisition ROE margin diff	
Constant	7.6298	***	-18.9816	***
	(2.8391)		(2.2604)	
Pre-acquisition ROE margin / ROE margin difference	0.1962	**	0.2149	**
	(0.0851)		(0.0923)	
R-squared	0.0790		0.0932	
Adjusted R-squared	0.0773		0.0913	
P-value	0.0214	**	0.0203	**
Observations	557		497	

Source: compiled by the author
Notes:
1. Standard deviations in parenthesis.
2. Significance levels: * 0.1; ** 0.05; ***0.01.

As can be seen in Table 8, the intercept for ROE compared to both the sample historicals (left model) and peer group (right model) are statistically significant, meaning that M&As do have a significant effect on the post-M&A period vis-à-vis pre-M&A. This was also confirmed by the Wilcoxon tests. Assuming a 20% pre-acquisition ROE margin for company i, the post-acquisition EBIT margin would be 7.63+0.196*20 = 10.8% (based on the model on the left). For testing in comparison to the peer group companies, the author used differences in the company and peer group values pre- and post-acquisition. The ROE margin differences are calculated by sample minus peer group. Thus, assuming that the pre-acquisition difference between the company i and peer group was 0, after the acquisition, the company i would have an ROE margin 19% (model on the right) lower than the peer group companies (difference between sample and peer group companies is -19%). Interestingly, the sample and peer group had large differences in terms of ROE both pre- and post-acquisition (Appendix 6, Appendix 16, Appendix 17). For both models, the independent variable (pre-M&A value) was statistically significant on a 5% level. Both models were statistically significant on a 5% level. Adjusted R-squared for the sample and peer group models were 0.077 and 0.091, respectively. OLS with robust standard errors were used in both model as heteroskedasticity was present in both cases. Models without robust standard errors with Breusch-Pagan and White tests are presented in Appendix 10.

3.3.2. Results of the difference-in-difference regression models

In addition to two-sample comparison tests and simple OLS models, the author also analysed the data with a difference-in-difference model (from here on out "DiD model") for all three profitability figures (Equation 5). As Heteroskedasticity was present in all models (models without robust standard errors with White and Breusch-Pagan tests shown in Appendix 11, Appendix 12 and Appendix 13), robust standard errors were used. All models presented in the following chapter have accounted for heteroskedasticity. The author will show four models per profitability figure (adding independent variables shown in Equation 5 and eventually arriving at Equation 6).

Table 9. Difference-in-difference (DiD) regression analysis results on ROA

	(1) DiD OLS		(2) DiD OLS		(3) DiD OLS		(4) DiD OLS	
Dependent variable	ROA		ROA		ROA		ROA	
Constant	7.918	***	9.925	***	9.441	***	7.715	***
	(0.319)		(0.216)		(0.104)		(0.477)	
Post-acquisition period	0.019		0.173		1.141	***	1.141	**
	(0.411)		(0.406)		(0.156)		(0.084)	
Acquiring company (vs Market)	-		-4.603	***	-3.493	***	-3.435	***
			(0.441)		(0.719)		(0.758)	
DiD	-		-		-2.142	**	-2.201	**
					(0.890)		(0.884)	
Industry_Manufacturing	-		-		-		1.504	**
							(0.662)	
Industry_Financial	-		-		-		5.862	***
							(0.816)	
Industry_Services	-		-		-		1.985	***
							(0.624)	
Industry_Other	-		-		-		0.817	
							(0.675)	
Industry_Utilities	-		-		-		-1.065	
							(0.703)	
International (vs Domestic)	-		-		-		-0.031	
							(1.069)	
R-squared	0.000		0.0448		0.0472		0.0720	
Adjusted R-squared	-0.000		0.0441		0.0462		0.0691	
P-value	0.963		0.000	***	0.000	***	0.000	***
Observations	704		704		704		704	

Source: compiled by the author
Notes:
1) Robust standard errors used as heteroskedasticity was present in the models (models without robust standard errors with White and Breusch-Pagan test results provided in Appendix 11).
2) Standard errors presented in parenthesis.
3) Significance levels: * 0.1; ** 0.05; ***0.01.

The regular DiD model (model 3 in Table 9) as a whole is statistically significant with the period and influenced group (acquirers vs market) being statistically significant on a 1% level while the DiD estimate is significant on a 5% level. According to the third model, acquiring companies in the post-acquisition period had over 2pp-s lower ROA margin than peer group companies. In the fourth model, the author added industry dummies (retail industry being the default) and type of the acquisition (international or domestic with domestic being the default). Adding additional variables increased the model's R-squared. In addition to previous significant variables, manufacturing industry, financial industry and services industry were statistically significant on at least a 5% level. Utilities and other industries did not yield statistically significant results.

Table 10. Difference-in-difference (DiD) regression analysis results on ROE

	(1) DiD OLS	(2) DiD OLS	(3) DiD OLS	(4) DiD OLS
Dependent variable	ROE	ROE	ROE	ROE
Constant	18.099 *** (1.550)	24.612 *** (0.968)	23.907 *** (0.159)	26.630 *** (1.911)
Post-acquisition period	0.000 (1.919)	0.510 (1.922)	1.921 *** (0.229)	1.921 *** (0.174)
Acquiring company (vs Market)	-	-15.130 *** (2.120)	-13.491 *** (3.575)	-22.338 *** (3.743)
DiD	-	-	-3.159 (4.300)	-3.129 (4.295)
Industry_Manufacturing	-	-	-	-5.694 ** (2.895)
Industry_Financial	-	-	-	-1.633 (2.641)
Industry_Services	-	-	-	-0.239 (2.669)
Industry_Other	-	-	-	-6.105 * (3.215)
Industry_Utilities	-	-	-	-6.984 ** (2.784)
International (vs Domestic)	-	-	-	7.347 (4.869)
R-squared	0.000	0.0224	0.0227	0.0272
Adjusted R-squared	-0.000	0.0217	0.0216	0.0240
P-value	0.999	0.000 ***	0.000 ***	0.000 ***
Observations	697	697	697	697

Source: compiled by the author
Notes:
1) Robust standard errors used as heteroskedasticity was present in the models (models without robust standard errors with White and Breusch-Pagan test results provided in Appendix 12).
2) Standard errors presented in parenthesis.
3) Significance levels: * 0.1; ** 0.05; ***0.01.

The regular DiD model (model 3 in Table 10) as a whole is statistically significant with the period and influenced group (acquirers vs market) being statistically significant on a 1% level while the DiD estimate is not statistically significant. In the fourth model, the author added industry dummies (retail industry being the default) and type of the acquisition (international or domestic). In addition to previous significant variables, manufacturing industry, utilities industry and other industries were statistically significant on at least a 10% level. Financial and services sector did not yield statistically significant results. Type of the acquisition (international or domestic) is not statistically significant.

Table 11. Difference-in-difference (DiD) regression analysis results on EBIT margin

	(1) DiD OLS	(2) DiD OLS	(3) DiD OLS	(4) DiD OLS
Dependent variable	EBITm	EBITm	EBITm	EBITm
Constant	8.013 *** (0.434)	8.767 *** (0.376)	8.610 *** (0.316)	3.605 *** (0.425)
Post-acquisition period	-0.442 (0.604)	-0.380 (0.603)	-0.066 (0.424)	-0.066 (0.133)
Acquiring company (vs Market)	-	-1.864 *** (0.687)	-1.475 (1.017)	4.156 ** (2.102)
DiD	-	-	-0.748 (1.378)	-0.830 (1.302)
Industry_Manufacturing	-	-	-	2.323 *** (0.534)
Industry_Financial	-	-	-	22.245 *** (1.303)
Industry_Services	-	-	-	1.418 ** (0.594)
Industry_Other	-	-	-	5.885 *** (0.886)
Industry_Utilities	-	-	-	6.828 *** (1.139)
International (vs Domestic)	-	-	-	-3.785 ** (1.560)
R-squared	0.0002	0.0040	0.0038	0.1709
Adjusted R-squared	-0.0002	0.0029	0.0027	0.1681
P-value	0.465	0.020 **	0.048 **	0.000 ***
Observations	666	666	666	666

Source: compiled by the author
Notes:
1) Robust standard errors used as heteroskedasticity was present in the models (models without robust standard errors with White and Breusch-Pagan test results provided in Appendix 13).
2) Standard errors presented in parenthesis.
3) Significance levels: * 0.1; ** 0.05; ***0.01.

The regular DiD model (model 3 in Table 11) as a whole is statistically significant while none of the independent variables are statistically significant (other than the constant). In the fourth model, the author added industry dummies (retail industry being the default) and type of the acquisition (international or domestic). Influenced group (acquiring companies vs peer group), type of acquisition (international vs domestic), manufacturing industry, financial industry, services industry, utilities and other industries were statistically significant on at least a 5% level. Interestingly, in case of EBIT margin, the type of acquisition impacts the EBIT margin of the acquiring company

3.4. Conclusions and suggestions

Wilcoxon tests were done for all the chosen variables (current ratio, liquidity, solvency (asset based), solvency (liquidity based), ROA, ROE and EBIT margin). Using purely sample data (comparing company figures pre- and post-M&A), all variables besides the two solvency figures and EBIT margin (vis-à-vis peer group) were statistically relevant on a 5% level for both the mean and median values. Using mean values, current ratio, liquidity, ROA and EBIT margin were statistically relevant on a 5% level. Using median values, current ratio, ROA and ROE were statistically significant on a 5% level. To compare the sample data against market figures, double-difference (DD) approach was chosen. In comparison against market data, six of the seven (all besides solvency (liability based)) variables were statistically significant on a 5% level in case of both mean and median values. The movement on these variables has been downwards in terms of both mean values and median values, indicating that M&As decrease all figures, including profitability.

In addition to Wilcoxon tests, OLS models were used to estimate the differences between pre- and post-M&A figures. OLS models were only done for profitability (ROA, ROE, EBIT margin) as this is the main focus of the thesis. All of the OLS regression models where the sole variable was the profitability figure pre-acquisition, were statistically significant for estimating the post-acquisition figure. In case of EBIT margin, the intercept was not statistically significant, meaning that M&As do not have an impact on the post-acquisition EBIT margin in comparison to the sample historicals. Intercepts for ROA and ROE models, however, were both statistically relevant, meaning that the acquisition does have an impact on the post-acquisition results. The OLS was

also done for comparison with the peer group. All three models had a statistically significant intercept on a 5% level.

Additionally, difference-in-difference (DD) models were constructed for additional analysis. In case of the DD models, only ROA had a statistically significant DD parameter while the results for ROE and EBIT margin were inconclusive. For example, in case of ROA, the sample companies had roughly 2 pp-s lower ROA margin than the peer group. Further analysis with the DD models was made by adding industry dummies and type of acquisition dummy (international or domestic). In multiple models, different industries and/or type of the acquisition were statistically significant.

Overall, the research indicates that pre- and post-acquisition profitability figures are statistically significant both vis-à-vis sample historicals and peer group companies. It was observed that the average and median figures for the sample decreased post-acquisition, while the peer group saw steady margins or even slight increases, however, not all models showed the statistical significance of the movements, thus, a conclusive conclusion cannot be drawn. However, overall, the data does seem more skewed towards M&As being detrimental to the acquirer's profitability.

CONCLUSION

The two main growth possibilities for companies are through organic growth and through external growth (M&As). An M&A involves a target company's assets and/or operations being taken over by an acquirer. To remain competitive and to not lose one's competitive advantage, companies often need to turn some of their focus and resources to M&As. Acquisitions are typically done to increase market share, broaden the product pool, increase sales and to generate synergies (usually through economies of scale and/or scope) to name a few. The number of M&As and the overall deal values have increased rapidly in the past couple decades. Although acquisitions have become increasingly popular, the theoretical standpoints and empirical evidence is highly contradictory and conflicting. Researchers nor practitioners seem to have a clear understanding of the impact of M&As on the acquirers. While some researchers have found positive impacts, a plethora of others present the exact opposite findings. Despite the contradictory findings, companies still allocate significant resources towards M&As.

The main aim of the thesis is to identify, quantify and explain the impact of M&As on the acquirers' financials in the Baltics and Scandinavia. Although other financial figures are also analysed, the main focus is the impact on profitability. The author used acquisitions from 2015-2017 in which the acquirer was from the Baltics or Scandinavia. After certain eliminations, 822 acquisitions comprised the sample. The author selected three profitability figures for analysis – ROA, ROE and EBIT margin – based on previous research. The author analysed if and how the acquisitions impacted the acquirer companies. Analysis post-acquisition was done both in comparison to the sample companies' pre-acquisition and vis-à-vis more than 60 000 peer group companies from the Baltics and Scandinavia. Analysis was done by comparing three-year figures pre- and post-acquisition.

At the beginning of the thesis, the author raised three research questions which will be analysed throughout the thesis:

1) What is the impact of acquisitions on the acquirer's liquidity?

2) What is the impact of acquisitions on the acquirer's solvency?

3) What is the impact of acquisitions on the acquirer's profitability?

Three separate methodologies were used. Analysis on liquidity and solvency was only done with paired samples Wilcoxon tests, whereas profitability was analysed through Wilcoxon tests, a shorter simple OLS model and through a difference-in-difference OLS model. Based on the Wilcoxon tests, liquidity was significantly different pre- and post-acquisition comparing with the sample itself and to the peer group. Solvency of the acquirer did not have much of an effect on the acquirer in comparison to the sample historical figures, however, in comparison to the peer group, significant differences were observed. Using the Wilcoxon test, all profitability figures (ROA, ROE, EBIT margin) were statistically significant (at least on a 10% level) both in vis-à-vis sample historicals and the peer group. The simple OLS model indicated that in comparison to the sample historical figures, EBIT margin was not significantly affected by the acquisition, whereas vis-à-vis the peer group, the difference was significant on a 5% level. ROA and ROE revealed to be significant on a 1% level both in comparison to the sample and to the peer group. Using the difference-in-difference model, the event and time parameter was statistically significant only in case of ROA which shows a significant decrease in ROA in case on acquiring companies in the post-acquisition period. The parameters were insignificant for ROE and EBIT margin. Additionally, the author added subsequent variables to the difference-in-difference model (industry dummies and acquisition type dummy). Many sectors turned out to be statistically significant in case of all profitability figures. Acquisition type (international vs domestic acquisition) was statistically significant (5% level) only in case of EBIT margin. According to the model, EBIT margin in case of international acquisitions was close to 4% lower in comparison to domestic acquisitions.

The analysis done by the author showed somewhat contradictory results in terms of significance, although, not in terms of impact differences (positive/negative). Based off previous research and the analysis done in the thesis, the author does believe that M&As do have a negative impact on profitability. For example, it was observed that the average and median figures for the sample decreased post-acquisition, while the peer group saw steady margins or even slight increases, however, not all models showed the statistical significance of the movements, thus, a conclusive conclusion cannot be drawn. However, the data does seem more skewed towards M&As being detrimental to the acquirer's profitability. The chosen methodologies have its faults and there are many other approaches to choose from. For example, the current approach does not take into

account synergy effects which might realize after a longer period. For future research, the author advises the following implementations:

- Check whether there are differences profitability (or other figures) depending on at what point in the M&A wave the acquisition was made.
- Using the same approach as the author, it would be worth experimenting with different time periods instead of 3 years before and after the M&A (e.g., 2 years or even 5 years).
- Eliminating smaller acquisitions relative to the acquirer's size (or where the acquisition was for minority share).
- Experimenting with different methodologies (e.g., event studies, case-specific research, ACAR, interviews/questionnaires).

KOKKUVÕTE

OMANDAMISTEHINGUTE MÕJU OMANDAJA LIKVIIDSUSELE, MAKSEVÕIMELISUSELE JA KASUMLIKKUSELE BALTIKUMI JA SKANDINAAVIA ETTEVÕTETE NÄITEL AASTATEL 2015-2017

Marnet Meister

Ettevõtete kaks peamist kasvuallikat on orgaaniline kasv ja mitteorgaaniline kasv (ehk läbi omandamistehingute). Omandamistehing hõlmab ostetava ettevõtte varade ja/või äritegevuse ülevõtmist omandaja poolt. Et püsida konkurentsivõimelise, peavad ettevõtted sageli suunama osa oma fookusest ja ressurssidest ühinemis- ja omandamistehingutele (M&A-d). Omandamistehinguid tehakse enamasti turuosa suurendamiseks, tootevaliku laiendamiseks, käibe suurendamiseks ja sünergiate tekitamiseks (üldiselt mastaabi- ja/või mitmekülgsussäästu kaudu). M&A-de arv ning tehingute väärtused on viimase paarikümne aasta jooksul kiiresti kasvanud. Kuigi omandamised on muutunud üha populaarsemaks, on teoreetilised seisukohad ja empiirilised tõendid väga vastuolulised. Ei teadlastel ega praktikutel pole selget arusaama M&A-de mõjust omandajale. Kuigi mõned teadlased on leidnud M&A-de positiivset mõju, on mitmed teised saanud täpselt vastupidised tulemused. Vaatamata vastuolulistele järeldustele, eraldavad ettevõtted siiski märkimisväärseid ressursse ühinemis- ja ülevõtmistehingutele.

Lõputöö põhieesmärgiks on kvantifitseerida ja selgitada ühinemis- ja omandamistehingute mõju omandajate finantsidele Baltikumis ja Skandinaavias. Kuigi analüüsitakse ka teisi finantsnäitajaid, on põhifookus mõjul kasumlikkusele. Autor kasutas tehinguid aastatel 2015-2017, mille puhul omandaja oli Baltikumist või Skandinaaviast. Pärast mõningasi elimineerimisi (nt ettevõtted, mis olid mitmeid omandamisi teinud) hõlmas valim 822 tehingut. Autor valis varasemate uuringute põhjal analüüsimiseks kolm kasumlikkuse näitajat – ROA, ROE ja ärikasumi marginaali. Autor analüüsis, kas ja kuidas omandamistehingud mõjutasid omandavaid ettevõtteid. M&A-järgne analüüs tehti nii võrdluses valimis olnud ettevõtetega kui ka enam kui 60 000 Baltikumis ja Skandinaavias tegutseva kontrollgrupi ettevõtete suhtes. Analüüs tehti kolme aasta andmete võrdlemise teel enne ja pärast omdandamist.

Töö alguses püstitas autor kolm uurimisküsimust:

1) Milline on omandamistehingute mõju omandaja likviidsusele?

2) Milline on omandamistehingute mõju omandaja maksevõimele?

3) Milline on omandamistehingute mõju omandaja kasumlikkusele?

Autor kasutas kolme erinevat metoodikat andmete analüüsimiseks. Likviidsuse ja maksevõime analüüsimiseks kasutati ainult kahe valimi Wilcoxoni testi, samas kui kasumlikkust analüüsiti Wilcoxoni testi, lühikese vähimruutude regressioonmudeliga (OLS) ning topelterinevuse regressioonmudeliga. Wilcoxoni testide põhjal selgus, et likviidsus enne ja pärast omandamistehingut erinesid oluliselt (võrreldes nii valimi enda kui ka kontrollgrupiga). Võrreldes valimi ajalooliste näitajatega, siis M&A omandaja maksevõimele erilist mõju ei avaldanud, kui kontrollgrupiga võrreldes täheldati olulisi erinevusi. Wilcoxoni testi kasutades olid kõik kasumlikkuse näitajad (ROA, ROE ja ärikasumi marginaal) statistiliselt olulised (vähemalt 10% tasemel). Võrreldes valimi ajalooliste andmetega, näitas lühike OLS mudel, et EBIT marginaali puhul statistiliselt olulist erinevust kahe perioodi vahel pole. Võrreldes aga kontrollgrupiga, oli statistiliselt oluline erinevus olemas (5% tasemel). ROA ja ROE osutusid 1% tasemel oluliseks võrreldes nii valimi enda kui ka kontrollgrupiga. Topelterinevuse meetodit kasutades oli sündmuse ja aja parameeter statistiliselt oluline ainult ROA puhul, mis näitab ROA olulist langust omandavate ettevõtete puhul omandamisjärgsel perioodil. ROE ja ärikasumi marginaali puhul olid parameetrid statistiliselt ebaolulised. Autor lisas topelterinevuse mudelitele täiendavad muutujad (sektorite fiktiivmuutujad, omandamistüübi – rahvusvaheline või riigisisene – fiktiivmuutuja). Mitmed sektorid osutusid ROA, ROE ja ärikasumi marginaali mudelitel statistiliselt oluliseks. Omandamise tüüp (rahvusvaheline või riigisisene) oli 5% tasemel statistiliselt oluline ainult ärikasumi marginaali puhul. Mudeli kohaselt oli EBIT marginaal rahvusvaheliste tehingute puhul ligi 4% madalam võrreldes riigisiseste tehingutega.

Autori tehtud analüüsid näitasid olulisuse osas mõnevõrra vastuolulisi tulemusi, kuigi mõju suuna (positiivne/negatiivne mõju) poolest vastuolulisi tulemusi ei identifitseeritud. Varasemate uuringute ja lõputöös tehtud analüüside põhjal leiab autor, et ühinemis- ja omandamistehingud avaldavad kasumlikkusele negatiivset mõju. Näiteks täheldati, et valimi keskmised ja mediaannäitajad langesid pärast omandamist, samal ajal kui kontrollgrupi marginaalid jäid samaks või lausa paranesid. Samas peab tõdema, et kõik mudelid ei viidanud statistiliselt olulistele muutustele, seega lõplikku järeldust ei saa teha.

50

Valitud uurimismeetoditel on omad puudujäägid ja uurimist saab läbi viia ka mitmete muude meetoditega. Näiteks ei võta praegune lähenemisviis arvesse sünergiaefekte, mis võivad ilmneda pikema aja pärast. Edasiste uuringute jaoks soovitab autor järgmisi tähelepanekuid:

- Uurida, kas kasumlikkuses (või muudes näitajates) on erinevusi sõltuvalt sellest, millises omandamislaine faasis tehing toimus.

- Autoriga sama lähenemist kasutades tasuks katsetada erinevate ajaperioodidega. Antud juhul kasutas autor kolme aasta andmeid enne ja pärast tehingut, kuid oleks soovitatav uurida ka kahe või viieaastast perioodi.

- Elimineerida valimist väiksemad tehingud võrreldes omandaja suurusega (või kui omandati vähemusosalus).

- Erinevate metodoloogiate katsetamine (näiteks sündmuste uuringud (*case study*), juhtumipõhised uuringud, aktsiahinna liikumiste analüüs M&A uudiste peale, intervjuud/ankeedid).

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APPENDICES

Appendix 1. Financial ratios used in the thesis and formulas used for the calculation

FINANCIAL RATIO	FORMULA
Current ratio	Current assets / Current liabilities
Liquidity ratio	(Current assets – Stocks) / Current liabilities
Solvency (asset based)	(Shareholder funds / Total assets) * 100
Solvency (liquidity based)	(Shareholder funds / (Non-current liabilities + Current liabilities)) * 100
ROA	(Net income / Total assets) * 100
ROE	(Net income / Shareholder funds) * 100
EBIT margin	(EBIT / Operating revenue) * 100

Source: *Orbis Europe User Guide*, (2020)

Appendix 2. Overview of previously done research in Europe and the United States

Author(s)	Year	Title	Sample	Methodology & variables	Key findings
Pervan M., Višić J., Barnjak K.	2015	The Impact of M&A on Company Performance: Evidence from Croatia	116 from Croatia (2008-2011)	M: paired-samples T test V: ROA, ROE, PM	Statistically insignificant differences pre- and post-M&A. Same result when vis-à-vis peer group companies
Seth A.	1990	Value Creation in Acquisitions: A Re-Examination of Performance Issues	104 from US (1962-1979). Assets > $10m	M: CAR V: stock prices	Value is created in both unrelated and related acquisitions. No indication that related acquisitions create more value
Pazarskis M., Vogiatzogloy M., Christodoulou P. Drogalas G.	2006	Exploring The Improvement of Corporate Performance After Mergers – The Case of Greece	50 firms listed on the Athens Stock Exchange	M: paired-samples T test V: Profitability (EBT, ROA, GP); Liquidity (QR, CR); Solvency (MC/TA, D/MC)	Profitability (below GP) and solvency of the acquirer decreased post-M&A, whereas, liquidity showed no statistically significant change
Filipovič D.	2012	Impact of Company's Size on Takeover Success	Original sample size 598 from Croatia (1998-2010). 43 completed questionnaires	M: questionnaire for management	According to respondents, 70% performed better after the takeover and 30% performed worse. Statistically significant correlation (performance of acquirer) between relative size of the acquirer and the target
Borodin A., Ziyadin S., Islyam G., Panaedova G.	2020	Impact of Mergers and Acquisitions on Companies' Financial Performance	138 from US and Europe (2016-2018)	M: paired T test and OLS V: EBIT and EQ/EV	EBIT margin decreased significantly for both regions, however, the results were statistically insignificant
Zaremba A., Płotnicki M.	2014	Mergers and Acquisitions: Evidence on Post-Announcement Performance From CEE Stock Markets	109 from CEE (2001-2014)	M: ACAR V: stock prices	In the short-term, positive and significant abnormal returns for both acquirers and targets. Long-term non-significant negative abnormal returns for acquiring companies
Dickerson A., Gibson H., Tsakalotos E.	1997	The Impact of Acquisitions on Company Performance: Evidence from a Large Panel of UK Firms	613 from UK	M: OLS regression V: size, leverage, profitability	Acquisitions have a detrimental impact on company performance as measured by profitability

Appendix 2. Overview of previously done research in Europe and the United States (cont.)

Author(s)	Year	Title	Sample	Methodology & variables	Key findings
Chatterjee S.	1986	Types of Synergy and Economic Value: The Impact of Acquisitions on Merging and Rival Firms	157 from US (1969-1972)	M: ACAR V: stock returns	Both acquiring firms and target firms experienced statistically significant abnormal returns during the 5-day period surrounding the acquisition.

Appendix 3. Overview of previously done research in the rest of the world

Author(s)	Year	Title	Sample	Methodology & variables	Key findings
Rani N., Yadav S., Jain P.	2013	Post-M&A Operating Performance of Indian Acquiring Frims: A Du Pont Analysis	383 from India (2003-2008)	M: paired-samples T test (5y) V: EBITDA/Assets; EBITDA/Sales; ROA	Statistically significant improvement in operating cash flow for the acquiring firms post-M&A. Statistically significant improvement in the long-term operating margins
Muhammad H., Waqas M., Migliori S.	2019	The Imapct of M&A on Bank's Financial Performance: Evidence from Emerging Economy	15 banks from Pakistan (2004-2015)	M: paired-samples T test, OLS V: 13 financial ratios (e.g. CR, ROA, ROE, ROI, EPS, D/E)	Liquidity, profitability and investment ratios are positively and significantly increased after the M&A. Solvency ratios have negative effects (mostly due to larger debt)
Akben-Selcuk E., Altiok-Yilmaz A.	2011	The Impact of Mergers and Acquisitions on Acquirer Performance: Evidence from Turkey	62 listed companies from Turkey (2003-2007)	M: ACAR and accounting analysis (paired-sample T test) V: stock prices and ROE, ROA, ROS	Analysis of both stock market and accounting data weakly support the hypothesis that acquirer companies are negatively affected by M&A activities
Kinateder H., Fabich M., Wagner N.	2017	Domestic Mergers and Acquisitions in BRICS countries: Acquirers and Targets	50 listed companies from BRICS (2006-2015). 6 (B), 7 (R), 12 (I), 19 (C), 6 (S), respectively.	M: ACAR V: stock prices	Targets earn significant positive announcement returns, while acquirers lose slightly. Target returns are negatively related to pre-announcement returns and firm size, while positively related with GDP growth
Aggarwal P., Garg S.	2019	Impact of Mergers and Acquisitions on Account-based Performance of Acquiring Firms in India	68 mergers from India (2007-2012)	M: paired-samples T test (3y) V: 7 variables (profitability, liquidity, solvency)	M&As provide positive results and improve accounting and financial position of a firm in the long-term. More than 50% of firms showed improvements 5 years post-M&A
Rahman R., Limmack R.J.	2004	Corporate Acquisitions and the Operating Performance of Malayisian Companies	94 listed acquiring and 113 private targets from Malaysia (1988-1992)	M: OLS regression V: operating cash flow to operationg assets ratio	OCF improves significantly in combined firms. Increase is driven by both increase in asset productivity and higher OCF margins

Appendix 3. Overview of previously done research in the rest of the world (cont.)

Author(s)	Year	Title	Sample	Methodology & variables	Key findings
Bertrand O., Betschinger M.	2011	Performance of Domestic and Cross-border Acquisitions: Empirical Evidence from Russian Acquirers	609 acquisitions from Russia (1999-2008)	M: OLS regression V: EBIT for profitability, D/A for solvency	Both domestic and international acquisitions lead to reduced performance compared to non-acquiring firms
Yeh T., Hoshino Y.	2002	Productivity and Operating Performance of Japanese Merging Firms: Keiretsu-related and Independent Mergers	86 non-financial Japanese firms (1970-1994)	M: paired-samples T test V: ROA, ROE, sales growth, # of employees, R&D growth	Merging firms suffer in terms of productivity, profitability, sales growth and employee growth
Sharma D., Ho J.	2002	The Impact of Acquisitions on Operating Performance: Some Australian Evidence	36 acquisitions from Australia (1986-1991)	M: regression analysis V: ROA, ROE, PM, EPS, CFO/TA, CFO margin	On the basis on four accrual and four cash flow performance measures, corporate acquisitions do not lead to significant post-acquisition improvements in operating performance
Grigorieva S., Petrunina T.	2015	The Performance of Mergers and Acquisitions in Emerging Capital Markets: New Angle	80 acquisitions (2003-2009). Acquisitions from Asia, CEE, SA	M: regression model and economic profit model V: four operating measures (e.g. EBITDA margin)	M&As are value-destroying for the combined firms. Long-run analysis shows negative industry-adjusted differences between post-acquisitions and pre-acquisition performance measures

Appendix 4. NACE codes grouping

Category	Short description of the sector	Grouping used in the models (dummies)
A1	Growing of non-perennial crops	Other
A1	Growing of perennial crops	Other
A1	Plant propagation	Other
A1	Animal production	Other
A1	Mixed farming	Other
A1	Support activities to agriculture and post-harvest crop activities	Other
A1	Hunting, trapping and related service activities	Other
A2	Silviculture and other forestry activities	Other
A2	Logging	Other
A2	Gathering of wild growing non-wood products	Other
A2	Support services to forestry	Other
A3	Fishing	Other
A3	Aquaculture	Other
B5	Mining of hard coal	Other
B5	Mining of lignite	Other
B6	Extraction of crude petroleum	Other
B6	Extraction of natural gas	Other
B7	Mining of iron ores	Other
B7	Mining of non-ferrous metal ores	Other
B8	Quarrying of stone, sand and clay	Other
B8	Mining and quarrying n	Other
B9	Support activities for petroleum and natural gas extraction	Other
B9	Support activities for other mining and quarrying	Other
C10	Processing and preserving of meat and production of meat products	Manufacturing
C10	Processing and preserving of fish, crustaceans and molluscs	Manufacturing
C10	Processing and preserving of fruit and vegetables	Manufacturing
C10	Manufacture of vegetable and animal oils and fats	Manufacturing
C10	Manufacture of dairy products	Manufacturing
C10	Manufacture of grain mill products, starches and starch products	Manufacturing
C10	Manufacture of bakery and farinaceous products	Manufacturing
C10	Manufacture of other food products	Manufacturing
C10	Manufacture of prepared animal feeds	Manufacturing
C11	Manufacture of beverages	Manufacturing
C12	Manufacture of tobacco products	Manufacturing
C13	Preparation and spinning of textile fibres	Manufacturing
C13	Weaving of textiles	Manufacturing
C13	Finishing of textiles	Manufacturing
C13	Manufacture of other textiles	Manufacturing
C14	Manufacture of wearing apparel, except fur apparel	Manufacturing
C14	Manufacture of articles of fur	Manufacturing
C14	Manufacture of knitted and crocheted apparel	Manufacturing

C15	Tanning and dressing of leather; manufacture of luggage, handbags, saddlery and harness; dressing and dyeing of fur	Manufacturing
C15	Manufacture of footwear	Manufacturing
C16	Sawmilling and planing of wood	Manufacturing
C16	Manufacture of products of wood, cork, straw and plaiting materials	Manufacturing
C17	Manufacture of pulp, paper and paperboard	Manufacturing
C17	Manufacture of articles of paper and paperboard	Manufacturing
C18	Printing and service activities related to printing	Manufacturing
C18	Reproduction of recorded media	Manufacturing
C19	Manufacture of coke oven products	Manufacturing
C19	Manufacture of refined petroleum products	Manufacturing
C20	Manufacture of basic chemicals, fertilisers and nitrogen compounds, plastics and synthetic rubber in primary forms	Manufacturing
C20	Manufacture of pesticides and other agrochemical products	Manufacturing
C20	Manufacture of paints, varnishes and similar coatings, printing ink and mastics	Manufacturing
C20	Manufacture of soap and detergents, cleaning and polishing preparations, perfumes and toilet preparations	Manufacturing
C20	Manufacture of other chemical products	Manufacturing
C20	Manufacture of man-made fibres	Manufacturing
C21	Manufacture of basic pharmaceutical products	Manufacturing
C21	Manufacture of pharmaceutical preparations	Manufacturing
C22	Manufacture of rubber products	Manufacturing
C22	Manufacture of plastics products	Manufacturing
C23	Manufacture of glass and glass products	Manufacturing
C23	Manufacture of refractory products	Manufacturing
C23	Manufacture of clay building materials	Manufacturing
C23	Manufacture of other porcelain and ceramic products	Manufacturing
C23	Manufacture of cement, lime and plaster	Manufacturing
C23	Manufacture of articles of concrete, cement and plaster	Manufacturing
C23	Cutting, shaping and finishing of stone	Manufacturing
C23	Manufacture of abrasive products and non-metallic mineral products n	Manufacturing
C24	Manufacture of basic iron and steel and of ferro-alloys	Manufacturing
C24	Manufacture of tubes, pipes, hollow profiles and related fittings, of steel	Manufacturing
C24	Manufacture of other products of first processing of steel	Manufacturing
C24	Manufacture of basic precious and other non-ferrous metals	Manufacturing
C24	Casting of metals	Manufacturing
C25	Manufacture of structural metal products	Manufacturing
C25	Manufacture of tanks, reservoirs and containers of metal	Manufacturing
C25	Manufacture of steam generators, except central heating hot water boilers	Manufacturing
C25	Manufacture of weapons and ammunition	Manufacturing
C25	Forging, pressing, stamping and roll-forming of metal; powder metallurgy	Manufacturing
C25	Treatment and coating of metals; machining	Manufacturing
C25	Manufacture of cutlery, tools and general hardware	Manufacturing
C25	Manufacture of other fabricated metal products	Manufacturing
C26	Manufacture of electronic components and boards	Manufacturing
C26	Manufacture of computers and peripheral equipment	Manufacturing
C26	Manufacture of communication equipment	Manufacturing
C26	Manufacture of consumer electronics	Manufacturing
C26	Manufacture of instruments and appliances for measuring, testing and navigation; watches and clocks	Manufacturing

C26	Manufacture of irradiation, electromedical and electrotherapeutic equipment	Manufacturing
C26	Manufacture of optical instruments and photographic equipment	Manufacturing
C26	Manufacture of magnetic and optical media	Manufacturing
C27	Manufacture of electric motors, generators, transformers and electricity distribution and control apparatus	Manufacturing
C27	Manufacture of batteries and accumulators	Manufacturing
C27	Manufacture of wiring and wiring devices	Manufacturing
C27	Manufacture of electric lighting equipment	Manufacturing
C27	Manufacture of domestic appliances	Manufacturing
C27	Manufacture of other electrical equipment	Manufacturing
C28	Manufacture of general-purpose machinery	Manufacturing
C28	Manufacture of other general-purpose machinery	Manufacturing
C28	Manufacture of agricultural and forestry machinery	Manufacturing
C28	Manufacture of metal forming machinery and machine tools	Manufacturing
C28	Manufacture of other special-purpose machinery	Manufacturing
C29	Manufacture of motor vehicles	Manufacturing
C29	Manufacture of bodies (coachwork) for motor vehicles; manufacture of trailers and semi-trailers	Manufacturing
C29	Manufacture of parts and accessories for motor vehicles	Manufacturing
C30	Building of ships and boats	Manufacturing
C30	Manufacture of railway locomotives and rolling stock	Manufacturing
C30	Manufacture of air and spacecraft and related machinery	Manufacturing
C30	Manufacture of military fighting vehicles	Manufacturing
C30	Manufacture of transport equipment n	Manufacturing
C31	Manufacture of furniture	Manufacturing
C32	Manufacture of jewellery, bijouterie and related articles	Manufacturing
C32	Manufacture of musical instruments	Manufacturing
C32	Manufacture of sports goods	Manufacturing
C32	Manufacture of games and toys	Manufacturing
C32	Manufacture of medical and dental instruments and supplies	Manufacturing
C32	Manufacturing n	Manufacturing
C33	Repair of fabricated metal products, machinery and equipment	Manufacturing
C33	Installation of industrial machinery and equipment	Manufacturing
D35	Electric power generation, transmission and distribution	Utilities
D35	Manufacture of gas; distribution of gaseous fuels through mains	Utilities
D35	Steam and air conditioning supply	Utilities
E36	Water collection, treatment and supply	Utilities
E37	Sewerage	Utilities
E38	Waste collection	Utilities
E38	Waste treatment and disposal	Utilities
E38	Materials recovery	Utilities
E39	Remediation activities and other waste management services	Utilities
F41	Development of building projects	Other
F41	Construction of residential and non-residential buildings	Other
F42	Construction of roads and railways	Other
F42	Construction of utility projects	Other
F42	Construction of other civil engineering projects	Other
F43	Demolition and site preparation	Other

F43	Electrical, plumbing and other construction installation activities	Other
F43	Building completion and finishing	Other
F43	Other specialised construction activities	Other
G45	Sale of motor vehicles	Retail
G45	Maintenance and repair of motor vehicles	Retail
G45	Sale of motor vehicle parts and accessories	Retail
G45	Sale, maintenance and repair of motorcycles and related parts and accessories	Retail
G46	Wholesale on a fee or contract basis	Retail
G46	Wholesale of agricultural raw materials and live animals	Retail
G46	Wholesale of food, beverages and tobacco	Retail
G46	Wholesale of household goods	Retail
G46	Wholesale of information and communication equipment	Retail
G46	Wholesale of other machinery, equipment and supplies	Retail
G46	Other specialised wholesale	Retail
G46	Non-specialised wholesale trade	Retail
G47	Retail sale in non-specialised stores	Retail
G47	Retail sale of food, beverages and tobacco in specialised stores	Retail
G47	Retail sale of automotive fuel in specialised stores	Retail
G47	Retail sale of information and communication equipment in specialised stores	Retail
G47	Retail sale of other household equipment in specialised stores	Retail
G47	Retail sale of cultural and recreation goods in specialised stores	Retail
G47	Retail sale of other goods in specialised stores	Retail
G47	Retail sale via stalls and markets	Retail
G47	Retail trade not in stores, stalls or markets	Retail
H49	Passenger rail transport, interurban	Services
H49	Freight rail transport	Services
H49	Other passenger land transport	Services
H49	Freight transport by road and removal services	Services
H49	Transport via pipeline	Services
H50	Sea and coastal passenger water transport	Services
H50	Sea and coastal freight water transport	Services
H50	Inland passenger water transport	Services
H50	Inland freight water transport	Services
H51	Passenger air transport	Services
H51	Freight air transport and space transport	Services
H52	Warehousing and storage	Services
H52	Support activities for transportation	Services
H53	Postal activities under universal service obligation	Services
H53	Other postal and courier activities	Services
I55	Hotels and similar accommodation	Services
I55	Holiday and other short-stay accommodation	Services
I55	Camping grounds, recreational vehicle parks and trailer parks	Services
I55	Other accommodation	Services
I56	Restaurants and mobile food service activities	Services
I56	Event catering and other food service activities	Services
I56	Beverage serving activities	Services

J58	Publishing of books, periodicals and other publishing activities	Services
J58	Software publishing	Services
J59	Motion picture, video and television programme activities	Services
J59	Sound recording and music publishing activities	Services
J60	Radio broadcasting	Services
J60	Television programming and broadcasting activities	Services
J61	Wired telecommunications activities	Services
J61	Wireless telecommunications activities	Services
J61	Satellite telecommunications activities	Services
J61	Other telecommunications activities	Services
J62	Computer programming, consultancy and related activities	Services
J63	Data processing, hosting and related activities; web portals	Services
J63	Other information service activities	Services
K64	Monetary intermediation	Financial
K64	Activities of holding companies	Financial
K64	Trusts, funds and similar financial entities	Financial
K64	Other financial service activities, except insurance and pension funding	Financial
K65	Insurance	Financial
K65	Reinsurance	Financial
K65	Pension funding	Financial
K66	Activities auxiliary to financial services, except insurance and pension funding	Financial
K66	Activities auxiliary to insurance and pension funding	Financial
K66	Fund management activities	Financial
L68	Buying and selling of own real estate	Other
L68	Renting and operating of own or leased real estate	Other
L68	Real estate activities on a fee or contract basis	Other
M69	Legal activities	Services
M69	Accounting, bookkeeping and auditing activities; tax consultancy	Services
M70	Activities of head offices	Services
M70	Management consultancy activities	Services
M71	Architectural and engineering activities and related technical consultancy	Services
M71	Technical testing and analysis	Services
M72	Research and experimental development on natural sciences and engineering	Services
M72	Research and experimental development on social sciences and humanities	Services
M73	Advertising	Services
M73	Market research and public opinion polling	Services
M74	Specialised design activities	Services
M74	Photographic activities	Services
M74	Translation and interpretation activities	Services
M74	Other professional, scientific and technical activities n	Services
M75	Veterinary activities	Services
N77	Renting and leasing of motor vehicles	Services
N77	Renting and leasing of personal and household goods	Services
N77	Renting and leasing of other machinery, equipment and tangible goods	Services
N77	Leasing of intellectual property and similar products, except copyrighted works	Services
N78	Activities of employment placement agencies	Services

N78	Temporary employment agency activities	Services
N78	Other human resources provision	Services
N79	Travel agency and tour operator activities	Services
N79	Other reservation service and related activities	Services
N80	Private security activities	Services
N80	Security systems service activities	Services
N80	Investigation activities	Services
N81	Combined facilities support activities	Services
N81	Cleaning activities	Services
N81	Landscape service activities	Services
N82	Office administrative and support activities	Services
N82	Activities of call centres	Services
N82	Organisation of conventions and trade shows	Services
N82	Business support service activities n	Services
O84	Administration of the State and the economic and social policy of the community	Other
O84	Provision of services to the community as a whole	Other
O84	Compulsory social security activities	Other
P85	Pre-primary education	Services
P85	Primary education	Services
P85	Secondary education	Services
P85	Higher education	Services
P85	Other education	Services
P85	Educational support activities	Services
Q86	Hospital activities	Services
Q86	Medical and dental practice activities	Services
Q86	Other human health activities	Services
Q87	Residential nursing care activities	Services
Q87	Residential care activities for mental retardation, mental health and substance abuse	Services
Q87	Residential care activities for the elderly and disabled	Services
Q87	Other residential care activities	Services
Q88	Social work activities without accommodation for the elderly and disabled	Services
Q88	Other social work activities without accommodation	Services
R90	Creative, arts and entertainment activities	Other
R91	Libraries, archives, museums and other cultural activities	Other
R92	Gambling and betting activities	Other
R93	Sports activities	Other
R93	Amusement and recreation activities	Other
S94	Activities of business, employers and professional membership organisations	Other
S94	Activities of trade unions	Other
S94	Activities of other membership organisations	Other
S95	Repair of computers and communication equipment	Other
S95	Repair of personal and household goods	Other
S96	Other personal service activities	Other
T97	Activities of households as employers of domestic personnel	Other
T98	Undifferentiated goods-producing activities of private households for own use	Other
T98	Undifferentiated service-producing activities of private households for own use	Other

U99	Activities of extraterritorial organisations and bodies	Other

Source: *EUROPA - Competition - List of NACE Codes* (2022)

Appendix 5. Detailed version of Difference-in-difference (DiD or DD) OLS model (Equation 6)

$$Y_{it} = \alpha + \theta I_a T + \gamma_1 I_a + \gamma_2 T + \gamma_3 S_1 + \gamma_4 S_2 + \gamma_5 S_3 + \gamma_6 S_4 + \gamma_7 S_5 + \gamma_8 S_6 \qquad (6)$$
$$+ \gamma_9 D + \varepsilon_a$$

where

Y_{it} – dependent variable (ROA, ROE and operating (EBIT) margin) post-acquisition,

α – intercept,

θ – event and time coefficient estimation parameter, DD (from Equation 1 and Equation 2),

I_a – dummy variable for influenced group (acquiring companies),

T – dummy variable for time/period (post-acquisition period),

γ_1-γ_9 – independent variable parameter (dummy),

S_1 – independent dummy variable, which is equal to 1 if the acquirer is mainly active in financial and insurance services, otherwise the value is 0,

S_2 – independent dummy variable, which is equal to 1 if the acquirer is mainly active in manufacturing, otherwise the value is 0,

S_3 – independent dummy variable, which is equal to 1 if the acquirer is mainly active in the services sector, otherwise the value is 0,

S_4 – independent dummy variable, which is equal to 1 if the acquirer is mainly active in energy/utilities, otherwise the value is 0,

S_5 – independent dummy variable, which is equal to 1 if the acquirer is mainly active in retail, otherwise the value is 0,

S_6 – independent dummy variable, which is equal to 1 if the acquirer is mainly active in other sectors, otherwise the value is 0,

D – independent dummy variable, which is equal to 1 if the acquisition was domestic, otherwise (international acquisition) the value is 0,

ε – zero mean disturbance term,

i – company index,

t – time index.

Appendix 6. Descriptive statistics of variables (Sample values, market values and corresponding differences

Variable	Category	Mean		Median	
		Pre-M&A	Post-M&A	Pre-M&A	Post-M&A
Current ratio	Sample	3.10	2.95	1.41	1.30
	Market	1.89	1.85	1.66	1.73
	Difference	1.26	1.13	-0.30	-0.45
Liquidity ratio	Sample	2.66	2.49	1.09	1.03
	Market	1.65	1.57	1.40	1.47
	Difference	1.09	0.94	-0.30	-0.45
Solvency (asset based)	Sample	42.27	40.91	39.58	38.08
	Market	43.70	45.13	40.72	44.13
	Difference	-0.99	-4.18	-1.59	-5.19
Solvency (liability based)	Sample	48.52	47.05	49.03	45.63
	Market	39.52	40.26	39.79	41.11
	Difference	8.96	6.25	8.14	5.49
ROA	Sample	5.95	4.95	5.35	4.35
	Market	9.44	10.58	8.82	10.19
	Difference	-3.44	-5.64	-3.05	-5.66
ROE	Sample	10.42	9.18	13.73	12.26
	Market	23.91	25.83	21.26	23.91
	Difference	-13.58	-16.73	-9.48	-13.80
EBIT	Sample	7.13	6.32	5.12	4.23
	Market	8.61	8.54	5.98	6.26
	Difference	-0.20	-1.13	-0.11	-1.23

Source: compiled by the author based on data from Mergermarket and Orbis Europe

Note: Differences presented do not match with table sample and market data as the differences were calculated by assigning each sample company an industry figure (and then calculating the difference).

Appendix 7. Correlation matrix for all variables

	Current PRE3	Current POST3	Liquidity PRE3	Liquidity POST3	SolA PRE3	SolA POST3	SolL PRE3	SolL POST3	ROE PRE3	ROE POST3	ROA PRE3	ROA POST3	EBIT PRE3	EBIT POST3
CurrentPRE3	1.00	-	-	-	-	-	-	-	-	-	-	-	-	-
CurrentPOST3	0.36	1.00	-	-	-	-	-	-	-	-	-	-	-	-
LiquidityPRE3	0.98	0.36	1.00	-	-	-	-	-	-	-	-	-	-	-
LiquidityPOST3	0.41	0.97	0.38	1.00	-	-	-	-	-	-	-	-	-	-
SolAPRE3	0.42	0.25	0.40	0.22	1.00	-	-	-	-	-	-	-	-	-
SolAPOST3	0.35	0.31	0.34	0.27	0.69	1.00	-	-	-	-	-	-	-	-
SolLPRE3	0.09	0.03	0.07	0.01	0.88	0.37	1.00	-	-	-	-	-	-	-
SolLPOST3	0.05	-0.04	0.01	-0.06	0.41	0.85	0.51	1.00	-	-	-	-	-	-
ROEPRE3	-0.02	-0.08	-0.02	-0.10	0.10	-0.05	0.12	0.05	1.00	-	-	-	-	-
ROEPOST3	0.02	0.00	0.01	0.00	0.02	0.09	-0.01	0.14	0.28	1.00	-	-	-	-
ROAPRE3	0.00	-0.11	0.00	-0.15	0.22	0.15	0.13	0.18	0.73	0.37	1.00	-	-	-
ROAPOST3	0.05	0.02	0.04	0.02	0.12	0.28	-0.01	0.23	0.21	0.64	0.46	1.00	-	-
EBITPRE3	0.02	-0.13	0.05	-0.04	0.11	0.17	0.01	0.07	0.33	0.19	0.45	0.32	1.00	-
EBITPOST3	0.11	-0.02	0.16	0.05	0.02	0.17	-0.02	0.08	0.17	0.24	0.28	0.44	0.70	1.00

Source: compiled by the author based on data from Mergermarket and Orbis Europe

Appendix 8. OLS regression models (EBIT) before tests for heteroskedasticity with White and Breusch-Pagan tests

	Against sample historical figures	Against peer group figures
	(1) Simple OLS	(2) Simple OLS
Dependent variable	Post-acquisition EBIT margin	Post-acquisition EBIT margin diff
Constant	1.1722 (0.7017)	-1.3996** (0.6659)
Pre-acquisition EBIT margin / EBIT margin difference	0.7127*** (0.0323)	0.7284*** (0.0341)
R-squared	0.4960	0.4971
Adjusted R-squared	0.4949	0.4961
P-value	0.000***	0.000***
White's test	0.000***	0.000***
Breusch-Pagan test	0.000***	0.000***
Observations	497	463

Source: compiled by the author

Notes:

1. Coefficients/estimates without parenthesis, standard errors in parenthesis
2. Significance levels: * 0.1; ** 0.05; ***0.01

Appendix 9. OLS regression models (ROA) before tests for heteroskedasticity with White and Breusch-Pagan tests

	Against sample historical figures	Against peer group figures
	(1) Simple OLS	(2) Simple OLS
Dependent variable	Post-acquisition ROA margin	Post-acquisition ROA margin diff
Constant	2.9790 (0.5138)	-5.1193** (0.5071)
Pre-acquisition ROA / ROA difference	0.3760*** (0.0301)	0.3883*** (0.0304)
R-squared	0.2150	0.2427
Adjusted R-squared	0.2136	0.2412
P-value	0.000***	0.000***
White's test	0.000***	0.000***
Breusch-Pagan test	0.7835	0.000***
Observations	573	512

Source: compiled by the author

Notes:

1. Coefficients/estimates without parenthesis, standard errors in parenthesis
2. Significance levels: * 0.1; ** 0.05; ***0.01

Appendix 10. OLS regression models (ROE) before tests for heteroskedasticity with White and Breusch-Pagan tests

	Against sample historical figures	Against peer group figures
	(1) Simple OLS	(2) Simple OLS
Dependent variable	Post-acquisition ROE margin	Post-acquisition ROE margin diff
Constant	7.630*** (2.251)	-18.982*** (2.533)
Pre-acquisition ROE margin / ROE margin difference	0.196*** (0.028)	0.215** (0.030)
R-squared	0.079	0.093
Adjusted R-squared	0.077	0.091
P-value	0.000***	0.000***
White's test	0.000***	0.000***
Breusch-Pagan test	0.000***	0.000***
Observations	557	497

Source: compiled by the author

Notes:
1. Coefficients/estimates without parenthesis, standard errors in parenthesis
2. Significance levels: * 0.1; ** 0.05; ***0.01

Appendix 11. DiD regression analysis results for ROA before tests for heteroskedasticity

	(3) DiD OLS	(4) DiD OLS
Dependent variable	ROA	ROA
Constant	9.441*** (0.381)	7.715*** (0.612)
Post-acquisition period	1.141*** (0.539)	1.141*** (0.532)
Acquiring company (vs Market)	-3.493*** (0.577)	-3.435*** (1.065)
DiD	-2.142** (0.802)	-2.201** (0.792)
Industry_Manufacturing	-	1.504** (0.712)
Industry_Financial	-	5.862*** (0.778)
Industry_Services	-	1.985*** (0.617)
Industry_Other	-	0.817 (0.689)
Industry_Utilities	-	-1.065 (1.089)
International (vs Domestic)	-	-0.031 (0.761)
R-squared	0.0472	0.0720
Adjusted R-squared	0.0462	0.0691
P-value	0.000***	0.000***
Observations	704	704
White's test	0.000	0.000
Breusch-Pagan test	0.000	0.000

Source: compiled by the author

Notes:

1. Coefficients/estimates without parenthesis, standard errors in parenthesis
2. Significance levels: * 0.1; ** 0.05; ***0.01

Appendix 12. DiD regression analysis results for ROE before tests for heteroskedasticity

	(3) DiD OLS	(4) DiD OLS
Dependent variable	ROE	ROE
Constant	23.907***	26.630***
	(1.790)	(2.916)
Post-acquisition period	1.921	1.921
	(2.531)	(2.528)
Acquiring company (vs Market)	-13.491***	-22.338***
	(2.728)	(5.107)
DiD	-3.159	-3.129
	(3.787)	(3.783)
Industry_Manufacturing	-	-5.694*
		(3.400)
Industry_Financial	-	-1.633
		(3.711)
Industry_Services	-	-0.239
		(2.946)
Industry_Other	-	-6.105*
		(3.286)
Industry_Utilities	-	-6.984
		(5.177)
International (vs Domestic)	-	7.347**
		(3.647)
R-squared	0.0272	0.0272
Adjusted R-squared	0.0240	0.0240
P-value	0.000***	0.000***
Observations	697	697
White's test	0.000	0.001
Breusch-Pagan test	0.000	0.000

Source: compiled by the author
Notes:
1. Coefficients/estimates without parenthesis, standard errors in parenthesis
2. Significance levels: * 0.1; ** 0.05; ***0.01

Appendix 13. DiD regression analysis results for EBIT before tests for heteroskedasticity

	(3) DiD OLS	(4) DiD OLS
Dependent variable	EBITm	EBITm
Constant	8.610*** (0.560)	3.605*** (0.838)
Post-acquisition period	-0.066 (0.793)	-0.066 (0.724)
Acquiring company (vs Market)	-1.475* (0.881)	4.156*** (1.527)
DiD	-0.748 (1.222)	-0.830 (1.117)
Industry_Manufacturing	-	2.323** (0.975)
Industry_Financial	-	22.245*** (1.120)
Industry_Services	-	1.418* (0.849)
Industry_Other	-	5.885*** (0.958)
Industry_Utilities	-	6.828*** (1.483)
International (vs Domestic)	-	-3.785*** (1.087)
R-squared	0.0038	0.1709
Adjusted R-squared	0.0027	0.1681
P-value	0.048**	0.000***
Observations	666	666
White's test	0.000	0.000
Breusch-Pagan test	0.000	0.000

Source: compiled by the author
Notes:
1. Coefficients/estimates without parenthesis, standard errors in parenthesis
2. Significance levels: * 0.1; ** 0.05; ***0.01

Appendix 14. R script for Wilcoxon test

```
library(readxl)
library(ggplot2)
library(stringr)
library(tidyverse)
library(ggpubr)
library(rstatix)
library(tidyr)
library(dplyr)
library(car)
library(lmtest)
library(MASS)
library(moments)
library(robustbase)


###############################################################
sapply(data_mean, class)

#make columns into numeric values
cols.num <- c("Current3", "Liquidity3", "SolA3", "SolL3", "ROA3", "ROE3", "EBIT3",
        "Current3M", "Liquidity3M", "SolA3M", "SolL3M", "ROA3M", "ROE3M", "EBIT3M",
        "Current3D", "Liquidity3D", "SolA3D", "SolL3D", "ROA3D", "ROE3D", "EBIT3D")
data[cols.num] <- sapply(data[cols.num],as.numeric)

cols.num2 <- c("CurrentPRE3", "LiquidityPRE3", "SolAPRE3", "SolLPRE3", "ROAPRE3",
"ROEPRE3", "EBITPRE3",
        "CurrentPRE3M", "LiquidityPRE3M", "SolAPRE3M", "SolLPRE3M", "ROAPRE3M",
"ROEPRE3M", "EBITPRE3M",
        "CurrentPRE3D", "LiquidityPRE3D", "SolAPRE3D", "SolLPRE3D", "ROAPRE3D",
"ROEPRE3D", "EBITPRE3D",
        "CurrentPOST3", "LiquidityPOST3", "SolAPOST3", "SolLPOST3", "ROAPOST3",
"ROEPOST3", "EBITPOST3",
```

```
                "CurrentPOST3M",    "LiquidityPOST3M",    "SolAPOST3M",    "SolLPOST3M",
"ROAPOST3M", "ROEPOST3M", "EBITPOST3M",
                "CurrentPOST3D",    "LiquidityPOST3D",    "SolAPOST3D",    "SolLPOST3D",
"ROAPOST3D", "ROEPOST3D", "EBITPOST3D")
data_mean[cols.num2] <- sapply(data_mean[cols.num2],as.numeric)


cols.num3 <- c("CurrentPRE3", "LiquidityPRE3", "SolAPRE3", "SolLPRE3", "ROAPRE3",
"ROEPRE3", "EBITPRE3",
                "CurrentPRE3M", "LiquidityPRE3M", "SolAPRE3M", "SolLPRE3M", "ROAPRE3M",
"ROEPRE3M", "EBITPRE3M",
                "CurrentPRE3D", "LiquidityPRE3D", "SolAPRE3D", "SolLPRE3D", "ROAPRE3D",
"ROEPRE3D", "EBITPRE3D",
                "CurrentPOST3", "LiquidityPOST3", "SolAPOST3", "SolLPOST3", "ROAPOST3",
"ROEPOST3", "EBITPOST3",
                "CurrentPOST3M",    "LiquidityPOST3M",    "SolAPOST3M",    "SolLPOST3M",
"ROAPOST3M", "ROEPOST3M", "EBITPOST3M",
                "CurrentPOST3D",    "LiquidityPOST3D",    "SolAPOST3D",    "SolLPOST3D",
"ROAPOST3D", "ROEPOST3D", "EBITPOST3D")
data_median[cols.num3] <- sapply(data_median[cols.num2],as.numeric)


################################################################################
#convert data to longer format
longer_data_mean <- data_mean %>% pivot_longer(CurrentPRE3:EBITPOST3D, names_to =
"variable", values_to = "value")


longer_data_median <- data_median %>% pivot_longer(CurrentPRE3:EBITPOST3D, names_to
= "variable", values_to = "value")
longer_data_median


################################################################################
#MW tests for mean values
#MW tests for comparison with market
curr_datasetD_mean  <-  longer_data_mean  %>%  dplyr::select(variable,  value)  %>%
group_by(variable) %>% filter(variable == "CurrentPRE3D" | variable == "CurrentPOST3D")
```

```
liq_datasetD_mean    <-    longer_data_mean    %>%    dplyr::select(variable,    value)    %>%
group_by(variable) %>% filter(variable == "LiquidityPRE3D" | variable == "LiquidityPOST3D")
SolA_datasetD_mean    <-    longer_data_mean    %>%    dplyr::select(variable,    value)    %>%
group_by(variable) %>% filter(variable == "SolAPRE3D" | variable == "SolAPOST3D")
SolL_datasetD_mean    <-    longer_data_mean    %>%    dplyr::select(variable,    value)    %>%
group_by(variable) %>% filter(variable == "SolLPRE3D" | variable == "SolLPOST3D")
ROA_datasetD_mean    <-    longer_data_mean    %>%    dplyr::select(variable,    value)    %>%
group_by(variable) %>% filter(variable == "ROAPRE3D" | variable == "ROAPOST3D")
ROE_datasetD_mean    <-    longer_data_mean    %>%    dplyr::select(variable,    value)    %>%
group_by(variable) %>% filter(variable == "ROEPRE3D" | variable == "ROEPOST3D")
EBIT_datasetD_mean    <-    longer_data_mean    %>%    dplyr::select(variable,    value)    %>%
group_by(variable) %>% filter(variable == "EBITPRE3D" | variable == "EBITPOST3D")


MWcurrD_mean <- wilcox.test(value ~ variable, data = curr_datasetD_mean, na.rm = TRUE,
paired = TRUE)
MWliqD_mean <- wilcox.test(value ~ variable, data = liq_datasetD_mean, na.rm = TRUE, paired
= TRUE)
MWsolAD_mean <- wilcox.test(value ~ variable, data = SolA_datasetD_mean, na.rm = TRUE,
paired = TRUE)
MWSolLD_mean <- wilcox.test(value ~ variable, data = SolL_datasetD_mean, na.rm = TRUE,
paired = TRUE)
MWROAD_mean <- wilcox.test(value ~ variable, data = ROA_datasetD_mean, na.rm = TRUE,
paired = TRUE)
MWROED_mean <- wilcox.test(value ~ variable, data = ROE_datasetD_mean, na.rm = TRUE,
paired = TRUE)
MWEBITD_mean <- wilcox.test(value ~ variable, data = EBIT_datasetD_mean, na.rm = TRUE,
paired = TRUE)


MWcurrD_mean
MWliqD_mean
MWsolAD_mean
MWSolLD_mean
MWROAD_mean
MWROED_mean
```

MWEBITD_mean

```r
#comparison with historicals
curr_dataset_mean <- longer_data_mean %>% dplyr::select(variable, value) %>% group_by(variable) %>% filter(variable == "CurrentPRE3" | variable == "CurrentPOST3")
liq_dataset_mean <- longer_data_mean %>% dplyr::select(variable, value) %>% group_by(variable) %>% filter(variable == "LiquidityPRE3" | variable == "LiquidityPOST3")
SolA_dataset_mean <- longer_data_mean %>% dplyr::select(variable, value) %>% group_by(variable) %>% filter(variable == "SolAPRE3" | variable == "SolAPOST3")
SolL_dataset_mean <- longer_data_mean %>% dplyr::select(variable, value) %>% group_by(variable) %>% filter(variable == "SolLPRE3" | variable == "SolLPOST3")
ROA_dataset_mean <- longer_data_mean %>% dplyr::select(variable, value) %>% group_by(variable) %>% filter(variable == "ROAPRE3" | variable == "ROAPOST3")
ROE_dataset_mean <- longer_data_mean %>% dplyr::select(variable, value) %>% group_by(variable) %>% filter(variable == "ROEPRE3" | variable == "ROEPOST3")
EBIT_dataset_mean <- longer_data_mean %>% dplyr::select(variable, value) %>% group_by(variable) %>% filter(variable == "EBITPRE3" | variable == "EBITPOST3")


MWcurr_mean <- wilcox.test(value ~ variable, data = curr_dataset_mean, na.rm = TRUE, paired = TRUE)
MWliq_mean <- wilcox.test(value ~ variable, data = liq_dataset_mean, na.rm = TRUE, paired = TRUE)
MWsolA_mean <- wilcox.test(value ~ variable, data = SolA_dataset_mean, na.rm = TRUE, paired = TRUE)
MWSolL_mean <- wilcox.test(value ~ variable, data = SolL_dataset_mean, na.rm = TRUE, paired = TRUE)
MWROA_mean <- wilcox.test(value ~ variable, data = ROA_dataset_mean, na.rm = TRUE, paired = TRUE)
MWROE_mean <- wilcox.test(value ~ variable, data = ROE_dataset_mean, na.rm = TRUE, paired = TRUE)
MWEBIT_mean <- wilcox.test(value ~ variable, data = EBIT_dataset_mean, na.rm = TRUE, paired = TRUE)


MWcurr_mean
```

MWliq_mean

MWsolA_mean

MWSolL_mean

MWROA_mean

MWROE_mean

MWEBIT_mean


```
################################################################################
#MW tests for median values
#MW tests for comparison with market
curr_datasetD_median <- longer_data_median %>% dplyr::select(variable, value) %>%
group_by(variable) %>% filter(variable == "CurrentPRE3D" | variable == "CurrentPOST3D")
liq_datasetD_median <- longer_data_median %>% dplyr::select(variable, value) %>%
group_by(variable) %>% filter(variable == "LiquidityPRE3D" | variable == "LiquidityPOST3D")
SolA_datasetD_median <- longer_data_median %>% dplyr::select(variable, value) %>%
group_by(variable) %>% filter(variable == "SolAPRE3D" | variable == "SolAPOST3D")
SolL_datasetD_median <- longer_data_median %>% dplyr::select(variable, value) %>%
group_by(variable) %>% filter(variable == "SolLPRE3D" | variable == "SolLPOST3D")
ROA_datasetD_median <- longer_data_median %>% dplyr::select(variable, value) %>%
group_by(variable) %>% filter(variable == "ROAPRE3D" | variable == "ROAPOST3D")
ROE_datasetD_median <- longer_data_median %>% dplyr::select(variable, value) %>%
group_by(variable) %>% filter(variable == "ROEPRE3D" | variable == "ROEPOST3D")
EBIT_datasetD_median <- longer_data_median %>% dplyr::select(variable, value) %>%
group_by(variable) %>% filter(variable == "EBITPRE3D" | variable == "EBITPOST3D")


MWcurrD_median <- wilcox.test(value ~ variable, data = curr_datasetD_median, na.rm = TRUE,
paired = TRUE)
MWliqD_median <- wilcox.test(value ~ variable, data = liq_datasetD_median, na.rm = TRUE,
paired = TRUE)
MWsolAD_median <- wilcox.test(value ~ variable, data = SolA_datasetD_median, na.rm =
TRUE, paired = TRUE)
MWSolLD_median <- wilcox.test(value ~ variable, data = SolL_datasetD_median, na.rm =
TRUE, paired = TRUE)
```

```
MWROAD_median <- wilcox.test(value ~ variable, data = ROA_datasetD_median, na.rm = TRUE, paired = TRUE)
MWROED_median <- wilcox.test(value ~ variable, data = ROE_datasetD_median, na.rm = TRUE, paired = TRUE)
MWEBITD_median <- wilcox.test(value ~ variable, data = EBIT_datasetD_median, na.rm = TRUE, paired = TRUE)


MWcurrD_median
MWliqD_median
MWsolAD_median
MWSolLD_median
MWROAD_median
MWROED_median
MWEBITD_median


#comparison with historicals
curr_dataset_median <- longer_data_median %>% dplyr::select(variable, value) %>% group_by(variable) %>% filter(variable == "CurrentPRE3" | variable == "CurrentPOST3")
liq_dataset_median <- longer_data_median %>% dplyr::select(variable, value) %>% group_by(variable) %>% filter(variable == "LiquidityPRE3" | variable == "LiquidityPOST3")
SolA_dataset_median <- longer_data_median %>% dplyr::select(variable, value) %>% group_by(variable) %>% filter(variable == "SolAPRE3" | variable == "SolAPOST3")
SolL_dataset_median <- longer_data_median %>% dplyr::select(variable, value) %>% group_by(variable) %>% filter(variable == "SolLPRE3" | variable == "SolLPOST3")
ROA_dataset_median <- longer_data_median %>% dplyr::select(variable, value) %>% group_by(variable) %>% filter(variable == "ROAPRE3" | variable == "ROAPOST3")
ROE_dataset_median <- longer_data_median %>% dplyr::select(variable, value) %>% group_by(variable) %>% filter(variable == "ROEPRE3" | variable == "ROEPOST3")
EBIT_dataset_median <- longer_data_median %>% dplyr::select(variable, value) %>% group_by(variable) %>% filter(variable == "EBITPRE3" | variable == "EBITPOST3")


MWcurr_median <- wilcox.test(value ~ variable, data = curr_dataset_median, na.rm = TRUE, paired = TRUE)
```

MWliq_median <- wilcox.test(value ~ variable, data = liq_dataset_median, na.rm = TRUE, paired = TRUE)

MWsolA_median <- wilcox.test(value ~ variable, data = SolA_dataset_median, na.rm = TRUE, paired = TRUE)

MWSolL_median <- wilcox.test(value ~ variable, data = SolL_dataset_median, na.rm = TRUE, paired = TRUE)

MWROA_median <- wilcox.test(value ~ variable, data = ROA_dataset_median, na.rm = TRUE, paired = TRUE)

MWROE_median <- wilcox.test(value ~ variable, data = ROE_dataset_median, na.rm = TRUE, paired = TRUE)

MWEBIT_median <- wilcox.test(value ~ variable, data = EBIT_dataset_median, na.rm = TRUE, paired = TRUE)

MWcurr_median
MWliq_median
MWsolA_median
MWSolL_median
MWROA_median
MWROE_median
MWEBIT_median

Source: compiled by the author in R

Appendix 15. Peer group three-year financial figures for 2015-2017

	Mean			Median		
	2015	2016	2017	2015	2016	2017
Current (pre)	2.77	2.81	2.83	1.66	1.68	1.69
Current (post)	2.82	2.88	2.97	1.70	1.70	1.76
Liquidity (pre)	2.25	2.29	2.31	1.30	1.32	1.34
Liquidity (post)	2.30	2.31	2.37	1.36	1.36	1.40
Solvency_A (pre)	39.27	39.84	40.60	38.46	39.20	39.86
Solvency_A (post)	40.65	41.16	42.15	40.24	40.96	42.13
Solvency_L (pre)	42.20	42.40	42.93	38.93	39.32	40.12
Solvency_L (post)	43.30	43.27	44.09	40.89	40.76	42.07
ROE (pre)	30.09	30.64	32.31	22.18	22.52	23.47
ROE (post)	32.02	30.40	33.13	24.30	23.36	24.67
ROA (pre)	10.25	10.62	11.13	7.90	8.16	8.53
ROA (post)	11.51	11.33	12.29	8.78	8.58	9.55
EBIT (pre)	6.99	7.13	7.38	4.66	4.74	4.87
EBIT (post)	7.53	7.27	7.70	5.00	4.75	5.19

Source: compiled by the author
Note: Each figure is either three-year average/median pre- or post the year presented above. For example, Current (pre) in 2015 is 2012-2014 average/median etc.

Appendix 16. Peer group vs sample based on mean figures
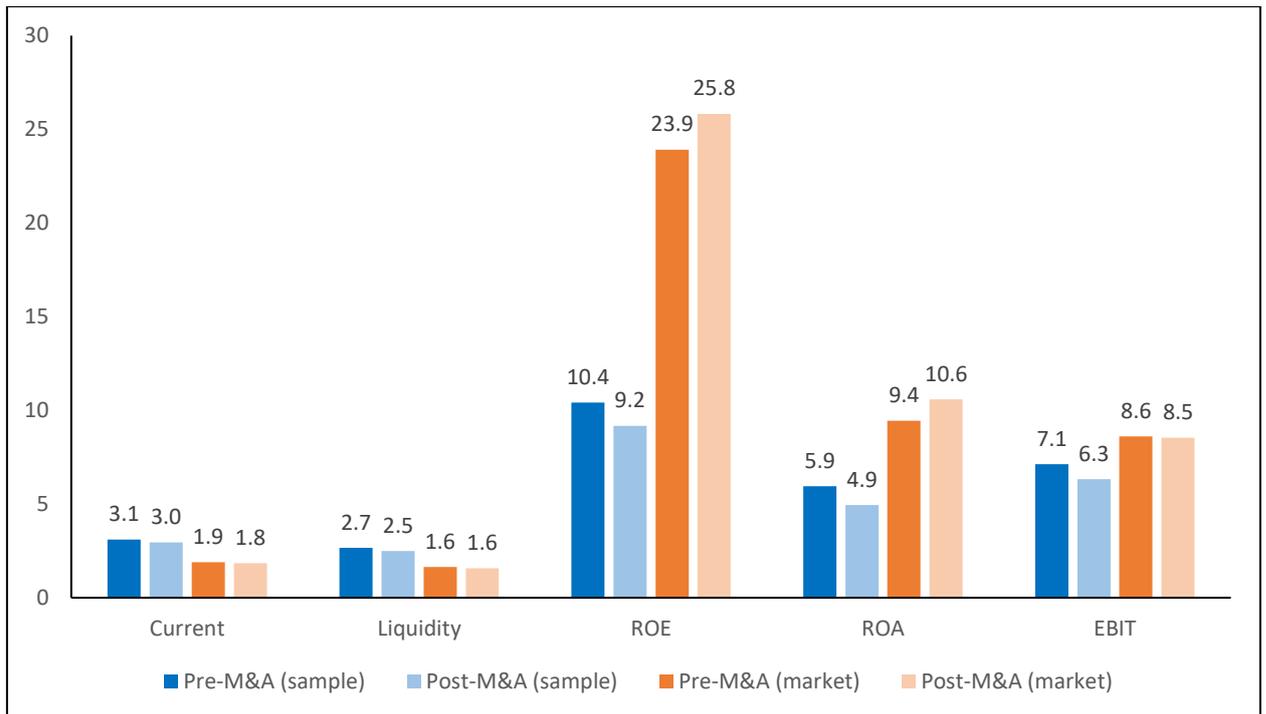
Source: compiled by the author based on data from Mergermarket and Orbis Europe

Appendix 17. Peer group vs sample based on median figures
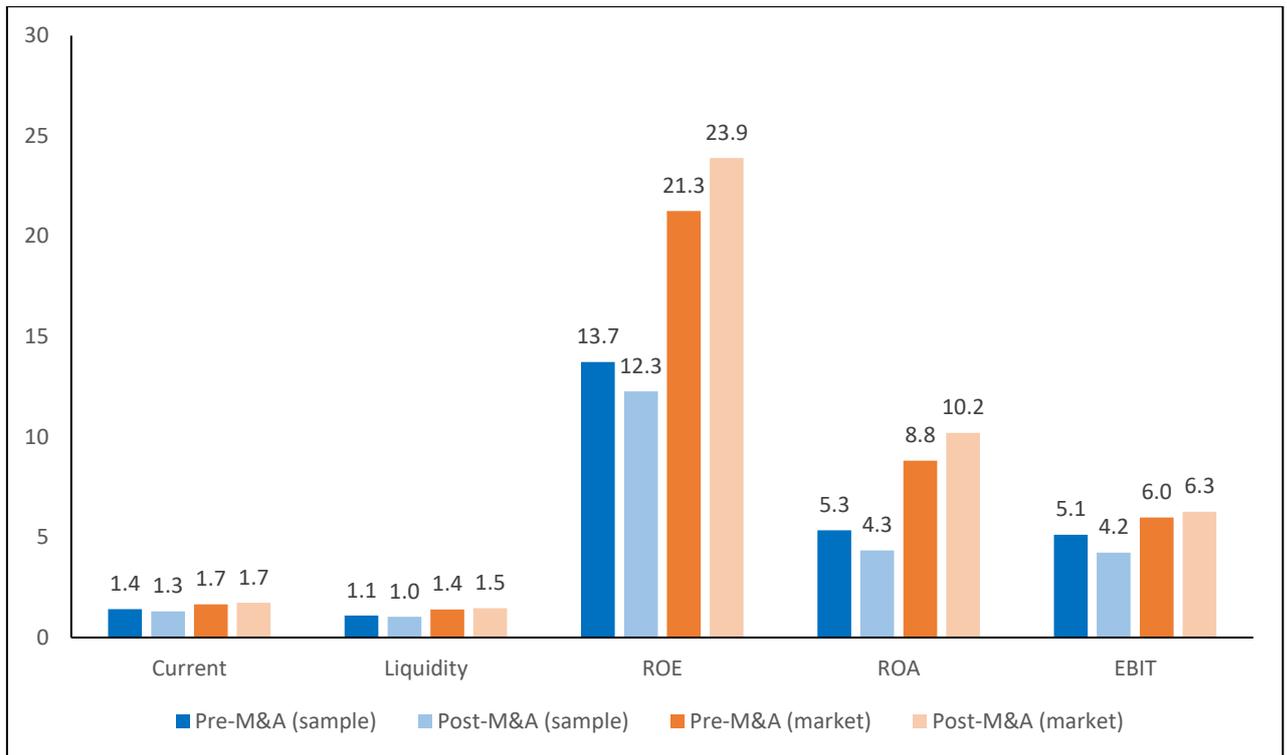
Source: compiled by the author based on data from Mergermarket and Orbis Europe

Appendix 18. Wilcoxon test on sample company historicals for Estonia

Wilcoxon test based on mean values			
Variable	**Sample size**	**W-value**	**P-value**
Current ratio	14	53	0.346
Liquidity	12	39	0.784
Solvency (asset based)	14	53	0.706
Solvency (liability based)	6	-	-
ROE	14	53	0.660
ROA	14	53	0.802
EBIT	11	33	0.689
Wilcoxon test based on median values			
Variable	**Sample size**	**W-value**	**P-value**
Current ratio	14	53	0.346
Liquidity	12	39	0.845
Solvency (asset based)	14	53	0.572
Solvency (liability based)	6	-	-
ROE	14	53	0.490
ROA	14	53	0.530
EBIT	11	33	0.824

Source: compiled by the author
Note:

1. Comparing sample company performance pre- and post-acquisition.
2. Empty values due to insufficient sample size.

Appendix 19. Wilcoxon test on sample company historicals for Lithuania

Wilcoxon test based on mean values			
Variable	**Sample size**	**W-value**	**P-value**
Current ratio	11	33	0.894
Liquidity	11	33	0.824
Solvency (asset based)	12	39	0.147
Solvency (liability based)	3	-	-
ROE	12	39	0.610
ROA	12	39	0.410
EBIT	11	33	0.056
Wilcoxon test based on median values			
Variable	**Sample size**	**W-value**	**P-value**
Current ratio	11	33	0.505
Liquidity	11	33	0.965
Solvency (asset based)	12	39	0.290
Solvency (liability based)	3	-	-
ROE	12	39	0.845
ROA	12	39	0.556
EBIT	11	33	0.168

Source: compiled by the author

Note:

1. Comparing sample company performance pre- and post-acquisition.
2. Empty values due to insufficient sample size.

Appendix 20. Wilcoxon test on sample company historicals for Finland

Wilcoxon test based on mean values			
Variable	**Sample size**	**W-value**	**P-value**
Current ratio	116	3393	0.001***
Liquidity	116	3393	0.007***
Solvency (asset based)	119	3570	0.100*
Solvency (liability based)	77	1502	0.831
ROE	111	3108	0.671
ROA	118	3511	0.449
EBIT	114	3278	0.230
Wilcoxon test based on median values			
Variable	**Sample size**	**W-value**	**P-value**
Current ratio	116	3393	0.004***
Liquidity	115	3393	0.015**
Solvency (asset based)	119	3570	0.140
Solvency (liability based)	77	1502	0.947
ROE	111	3108	0.624
ROA	118	3511	0.817
EBIT	114	3278	0.760

Source: compiled by the author

Note: Comparing sample company performance pre- and post-acquisition

Appendix 21. Wilcoxon test on sample company historicals for Sweden

Wilcoxon test based on mean values			
Variable	**Sample size**	**W-value**	**P-value**
Current ratio	235	13865	0.000***
Liquidity	233	13631	0.000***
Solvency (asset based)	241	14581	0.325
Solvency (liability based)	154	5968	0.418
ROE	239	14340	0.011**
ROA	240	14460	0.137
EBIT	208	10868	0.094*
Wilcoxon test based on median values			
Variable	**Sample size**	**W-value**	**P-value**
Current ratio	235	13865	0.000***
Liquidity	233	13631	0.000***
Solvency (asset based)	240	14580	0.287
Solvency (liability based)	154	5968	0.401
ROE	239	14340	0.028**
ROA	240	14460	0.128
EBIT	208	10868	0.125

Source: compiled by the author

Note: Comparing sample company performance pre- and post-acquisition

Appendix 22. Wilcoxon test on sample company historicals for Norway

Wilcoxon test based on mean values			
Variable	**Sample size**	**W-value**	**P-value**
Current ratio	170	7268	0.132
Liquidity	170	7268	0.128
Solvency (asset based)	181	8236	0.395
Solvency (liability based)	117	3452	0.689
ROE	174	7613	0.130
ROA	182	8327	0.033**
EBIT	146	5366	0.287
Wilcoxon test based on median values			
Variable	**Sample size**	**W-value**	**P-value**
Current ratio	170	7268	0.121
Liquidity	169	7267	0.087*
Solvency (asset based)	181	8236	0.327
Solvency (liability based)	117	3452	0.448
ROE	174	7613	0.042**
ROA	182	8327	0.043**
EBIT	146	5366	0.390

Source: compiled by the author

Note: Comparing sample company performance pre- and post-acquisition

Appendix 23. Wilcoxon test on sample company historicals against peer group for Estonia

Wilcoxon test based on mean values			
Variable	**Sample size**	**W-value**	**P-value**
Current ratio	12	39	0.724
Liquidity	11	33	0.756
Solvency (asset based)	12	39	0.224
Solvency (liability based)	6	-	-
ROE	12	39	0.610
ROA	12	39	0.505
EBIT	10	-	-
Wilcoxon test based on median values			
Variable	**Sample size**	**W-value**	**P-value**
Current ratio	12	39	0.844
Liquidity	11	33	0.824
Solvency (asset based)	12	39	0.126
Solvency (liability based)	6	-	-
ROE	12	39	0.610
ROA	12	39	0.367
EBIT	10	-	-

Source: compiled by the author
Note:

1. Comparing differences of sample companies and peer group companies pre- and post-acquisition (Figure 7).
2. Empty values due to insufficient sample size.

Appendix 24. Wilcoxon test on sample company historicals against peer group for Lithuania

Wilcoxon test based on mean values			
Variable	**Sample size**	**W-value**	**P-value**
Current ratio	11	33	0.894
Liquidity	11	33	0.965
Solvency (asset based)	11	33	0.100
Solvency (liability based)	3	-	-
ROE	11	33	0.307
ROA	11	33	0.142
EBIT	11	33	0.056
Wilcoxon test based on median values			
Variable	**Sample size**	**W-value**	**P-value**
Current ratio	11	33	0.450
Liquidity	11	33	0.824
Solvency (asset based)	11	33	0.197
Solvency (liability based)	3	-	-
ROE	11	33	0.450
ROA	11	33	0.197
EBIT	11	33	0.168

Source: compiled by the author
Note:

1. Comparing differences of sample companies and peer group companies pre- and post-acquisition (Figure 7).
2. Empty values due to insufficient sample size.

Appendix 25. Wilcoxon test on sample company historicals against peer group for Finland

Wilcoxon test based on mean values			
Variable	**Sample size**	**W-value**	**P-value**
Current ratio	104	2730	0.000***
Liquidity	104	2730	0.004***
Solvency (asset based)	104	2730	0.006***
Solvency (liability based)	71	1278	0.465
ROE	97	2377	0.496
ROA	103	2678	0.139
EBIT	103	2678	0.199
Wilcoxon test based on median values			
Variable	**Sample size**	**W-value**	**P-value**
Current ratio	104	2730	0.001***
Liquidity	104	2730	0.003***
Solvency (asset based)	104	2730	0.004***
Solvency (liability based)	71	1278	0.486
ROE	97	2377	0.974
ROA	103	2678	0.238
EBIT	103	2678	0.765

Source: compiled by the author

Note: Comparing differences of sample companies and peer group companies pre- and post-acquisition (Figure 7)

Appendix 26. Wilcoxon test on sample company historicals against peer group for Sweden

Wilcoxon test based on mean values			
Variable	**Sample size**	**W-value**	**P-value**
Current ratio	214	11503	0.000***
Liquidity	212	11289	0.000***
Solvency (asset based)	216	11718	0.003***
Solvency (liability based)	143	5148	0.132
ROE	214	11503	0.003***
ROA	215	11610	0.000***
EBIT	195	9555	0.015**
Wilcoxon test based on median values			
Variable	**Sample size**	**W-value**	**P-value**
Current ratio	214	11503	0.000***
Liquidity	212	11289	0.000***
Solvency (asset based)	216	11718	0.000***
Solvency (liability based)	143	5148	0.071*
ROE	214	11503	0.001***
ROA	215	11610	0.000***
EBIT	195	9555	0.035**

Source: compiled by the author

Note: Comparing differences of sample companies and peer group companies pre- and post-acquisition (Figure 7)

Appendix 27. Wilcoxon test on sample company historicals against peer group for Norway

Wilcoxon test based on mean values			
Variable	**Sample size**	**W-value**	**P-value**
Current ratio	160	6640	0.008***
Liquidity	160	6640	0.042**
Solvency (asset based)	163	6683	0.853
Solvency (liability based)	113	3321	0.989
ROE	156	6123	0.092*
ROA	164	6765	0.001***
EBIT	137	4727	0.211
Wilcoxon test based on median values			
Variable	**Sample size**	**W-value**	**P-value**
Current ratio	160	6440	0.037**
Liquidity	160	6440	0.022**
Solvency (asset based)	163	6683	0.598
Solvency (liability based)	113	3221	0.979
ROE	156	6123	0.013**
ROA	164	6765	0.005***
EBIT	137	4727	0.243

Source: compiled by the author

Note: Comparing differences of sample companies and peer group companies pre- and post-acquisition (Figure 7)

Appendix 28. Wilcoxon test on sample company historicals for Retail industry

Wilcoxon test based on mean values			
Variable	**Sample size**	**W-value**	**P-value**
Current ratio	89	2003	0.004***
Liquidity	89	2003	0.017**
Solvency (asset based)	89	2003	0.064*
Solvency (liability based)	64	1040	0.249
ROE	87	1914	0.261
ROA	89	2003	0.067*
EBIT	87	1914	0.098*
Wilcoxon test based on median values			
Variable	**Sample size**	**W-value**	**P-value**
Current ratio	89	2003	0.011**
Liquidity	89	2003	0.025**
Solvency (asset based)	89	2003	0.061*
Solvency (liability based)	64	1040	0.230
ROE	87	1914	0.125
ROA	89	2003	0.074*
EBIT	87	1914	0.188

Source: compiled by the author

Note: Comparing sample company performance pre- and post-acquisition

Appendix 29. Wilcoxon test on sample company historicals against peer group for Retail industry

Wilcoxon test based on mean values			
Variable	**Sample size**	**W-value**	**P-value**
Current ratio	89	2003	0.000***
Liquidity	89	2003	0.000***
Solvency (asset based)	89	2003	0.015**
Solvency (liability based)	64	1040	0.123
ROE	87	1914	0.141
ROA	89	2003	0.009***
EBIT	87	1914	0.040**
Wilcoxon test based on median values			
Variable	**Sample size**	**W-value**	**P-value**
Current ratio	89	2003	0.001***
Liquidity	89	2003	0.004***
Solvency (asset based)	89	2003	0.007***
Solvency (liability based)	64	1040	0.047**
ROE	87	1914	0.032**
ROA	89	2003	0.013**
EBIT	87	1914	0.088*

Source: compiled by the author

Note: Comparing differences of sample companies and peer group companies pre- and post-acquisition (Figure 7)

Appendix 30. Wilcoxon test on sample company historicals for Manufacturing industry

Wilcoxon test based on mean values			
Variable	**Sample size**	**W-value**	**P-value**
Current ratio	100	2525	0.031**
Liquidity	100	2525	0.092*
Solvency (asset based)	100	2525	0.966
Solvency (liability based)	65	1073	0.269
ROE	98	2425	0.542
ROA	100	2525	0.669
EBIT	96	2328	0.972
Wilcoxon test based on median values			
Variable	**Sample size**	**W-value**	**P-value**
Current ratio	100	2525	0.014**
Liquidity	99	2525	0.048**
Solvency (asset based)	100	2525	0.993
Solvency (liability based)	65	1073	0.166
ROE	98	2426	0.293
ROA	100	2525	0.493
EBIT	96	2328	0.958

Source: compiled by the author

Note: Comparing sample company performance pre- and post-acquisition

Appendix 31. Wilcoxon test on sample company historicals against peer group for Manufacturing industry

Wilcoxon test based on mean values			
Variable	**Sample size**	**W-value**	**P-value**
Current ratio	100	2525	0.010***
Liquidity	100	2525	0.027**
Solvency (asset based)	100	2525	0.459
Solvency (liability based)	65	1073	0.410
ROE	98	2426	0.407
ROA	100	2525	0.094*
EBIT	96	2328	0.585
Wilcoxon test based on median values			
Variable	**Sample size**	**W-value**	**P-value**
Current ratio	100	2525	0.006***
Liquidity	100	2525	0.010***
Solvency (asset based)	100	2525	0.228
Solvency (liability based)	65	1073	0.505
ROE	98	2525	0.033**
ROA	100	2525	0.062*
EBIT	96	2328	0.582

Source: compiled by the author

Note: Comparing differences of sample companies and peer group companies pre- and post-acquisition (Figure 7)

Appendix 32. Wilcoxon test on sample company historicals for Financial industry

Wilcoxon test based on mean values			
Variable	**Sample size**	**W-value**	**P-value**
Current ratio	45	518	0.031**
Liquidity	44	495	0.028**
Solvency (asset based)	61	946	0.752
Solvency (liability based)	21	116	0.972
ROE	60	915	0.301
ROA	61	946	0.385
EBIT	34	298	0.289
Wilcoxon test based on median values			
Variable	**Sample size**	**W-value**	**P-value**
Current ratio	45	518	0.021
Liquidity	44	495	0.030
Solvency (asset based)	61	946	0.886
Solvency (liability based)	21	-	-
ROE	60	915	0.558
ROA	661	946	0.943
EBIT	34	298	0.383

Source: compiled by the author
Note:

1. Comparing sample company performance pre- and post-acquisition.
2. Empty values due to insufficient sample size.

Appendix 33. Wilcoxon test on sample company historicals for Services industry

Wilcoxon test based on mean values			
Variable	**Sample size**	**W-value**	**P-value**
Current ratio	205	10558	0.004***
Liquidity	202	10252	0.005***
Solvency (asset based)	208	10868	0.146
Solvency (liability based)	136	4658	0.604
ROE	199	9950	0.021**
ROA	207	10764	0.080*
EBIT	183	8418	0.025**
Wilcoxon test based on median values			
Variable	**Sample size**	**W-value**	**P-value**
Current ratio	205	10558	0.011**
Liquidity	202	10252	0.017**
Solvency (asset based)	207	10868	0.203
Solvency (liability based)	136	4658	0.585
ROE	199	9950	0.109
ROA	207	10764	0.025**
EBIT	183	8418	0.049**

Source: compiled by the author

Note: Comparing sample company performance pre- and post-acquisition

Appendix 34. Wilcoxon test on sample company historicals against peer group for Services industry

Wilcoxon test based on mean values			
Variable	**Sample size**	**W-value**	**P-value**
Current ratio	205	10558	0.000***
Liquidity	202	10252	0.005***
Solvency (asset based)	208	10868	0.000***
Solvency (liability based)	136	4658	0.317
ROE	199	9950	0.010**
ROA	207	10764	0.000***
EBIT	183	8418	0.004***
Wilcoxon test based on median values			
Variable	**Sample size**	**W-value**	**P-value**
Current ratio	205	10558	0.000***
Liquidity	202	10252	0.000***
Solvency (asset based)	208	10868	0.000***
Solvency (liability based)	136	4658	0.155
ROE	199	9950	0.042**
ROA	207	10764	0.000***
EBIT	183	8418	0.018**

Source: compiled by the author

Note: Comparing differences of sample companies and peer group companies pre- and post-acquisition (Figure 7)

Appendix 35. Wilcoxon test on sample company historicals for Utilities industry

Wilcoxon test based on mean values			
Variable	**Sample size**	**W-value**	**P-value**
Current ratio	24	150	0.225
Liquidity	24	150	0.449
Solvency (asset based)	24	150	0.184
Solvency (liability based)	20	150	0.305
ROE	24	150	0.989
ROA	24	150	0.338
EBIT	24	150	0.875
Wilcoxon test based on median values			
Variable	**Sample size**	**W-value**	**P-value**
Current ratio	24	150	0.074*
Liquidity	23	150	0.198
Solvency (asset based)	24	150	0.214
Solvency (liability based)	20	105	0.467
ROE	24	150	0.484
ROA	24	150	0.898
EBIT	24	150	0.617

Source: compiled by the author

Note: Comparing sample company performance pre- and post-acquisition

Appendix 36. Wilcoxon test on sample company historicals against peer group for Utilities industry

Wilcoxon test based on mean values			
Variable	**Sample size**	**W-value**	**P-value**
Current ratio	24	150	0.029**
Liquidity	24	150	0.260
Solvency (asset based)	24	150	0.027**
Solvency (liability based)	20	105	0.185
ROE	24	150	0.449
ROA	24	150	0.119
EBIT	24	150	0.764
Wilcoxon test based on median values			
Variable	**Sample size**	**W-value**	**P-value**
Current ratio	24	150	0.106
Liquidity	24	150	0.384
Solvency (asset based)	24	150	0.027**
Solvency (liability based)	20	105	0.255
ROE	24	150	0.353
ROA	24	150	0.830
EBIT	24	150	0.617

Source: compiled by the author

Note: Comparing differences of sample companies and peer group companies pre- and post-acquisition (Figure 7)

Appendix 37. Wilcoxon test on sample company historicals for Other industry

Wilcoxon test based on mean values			
Variable	**Sample size**	**W-value**	**P-value**
Current ratio	90	2048	0.778
Liquidity	90	2048	0.939
Solvency (asset based)	92	2139	0.084*
Solvency (liability based)	55	770	0.728
ROE	89	2003	0.725
ROA	92	2139	0.887
EBIT	73	1351	0.839
Wilcoxon test based on median values			
Variable	**Sample size**	**W-value**	**P-value**
Current ratio	90	2048	0.303
Liquidity	90	2048	0.400
Solvency (asset based)	92	2139	0.098*
Solvency (liability based)	55	770	0.372
ROE	89	2003	0.572
ROA	92	2139	0.872
EBIT	73	1351	0.809

Source: compiled by the author

Note: Comparing sample company performance pre- and post-acquisition

Appendix 38. Wilcoxon test on sample company historicals against peer group for Other industry

Wilcoxon test based on mean values			
Variable	**Sample size**	**W-value**	**P-value**
Current ratio	90	2048	0.286
Liquidity	90	2048	0.372
Solvency (asset based)	92	2139	0.260
Solvency (liability based)	55	770	0.766
ROE	89	2003	0.439
ROA	92	2139	0.187
EBIT	73	1351	0.934
Wilcoxon test based on median values			
Variable	**Sample size**	**W-value**	**P-value**
Current ratio	90	2048	0.071*
Liquidity	90	2048	0.070*
Solvency (asset based)	92	2139	0.449
Solvency (liability based)	55	770	0.877
ROE	89	2003	0.122
ROA	92	2139	0.195
EBIT	73	1351	0.783

Source: compiled by the author

Note: Comparing differences of sample companies and peer group companies pre- and post-acquisition (Figure 7)

Appendix 39. Data used in the thesis

https://drive.google.com/drive/folders/1oGvMjwoxyM-g9KG9chcbBA8muX7TRCLE?usp=sharing

Source: Mergermarket, Orbis Europe

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