

Master's Thesis

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Impacts of Cross-border Mergers and Acquisitions on Profitability in Industrial Sector

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Abstract**Author:** Jessica Rantanen**Title:** Impacts of Cross-border Merger and Acquisitions on Profitability in Industrial sector**Master's thesis:** Lappeenranta University of Technology

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Synergies, globalization and the need for companies to maintain their position and competitiveness in the market can be seen as the main motives for international mergers and acquisitions. According to statistics, cross-border mergers started to grow globally in 2014. Growth can be seen as a willingness on the part of companies to take advantage of the growth in demand for goods and services brought about by economic growth. Cross-border acquisitions are being made for access to international markets, which in turn improves the availability of resources.

Even if the market situation were favorable, it does not mean that the merger does not involve risks. Several studies have suggested that one of the risks associated with a merger is the successful integration of two companies. The same applies to acquisitions where the acquirer has the authority over the target company and the acquirer has the power to decide on the real processes of the acquired company. Challenges may arise when two companies from different industries or cultures are united. Mergers may not succeed if synergy benefits are overestimated or unexpected changes occur in market dynamics. Synergistic benefits can be difficult to implement due to the challenges related to the changed client base. Increased market competition may pose a threat to companies' profitability as well.

In this paper, the impact of cross-border mergers on profitability was studied using quantitative methods. The sample consisted of 505 industrial companies from 13 countries in the euro area. The results of the research showed that companies operating in the industrial sector will become more capital intensive as a result of mergers and acquisitions. Capital intensity creates barriers to entry and thus maintains profitability. This was reflected in the average improvement in the operating margin and EBITDA margin of the companies, but on the other hand as a weakened turnover. This confirms, as in previous studies, that it is easier to obtain cost benefits than to enhance revenue. The average Profit after tax margin of the companies was weakened so that, from the point of view of owners and investors, in the short term, mergers would not serve their interests because of the reduced profitability. In addition, the Return on assets seemed to weaken due to mergers and acquisitions. Based on statistical results, there was no evidence that cross-border mergers would affect profitability differently than domestic transactions. However, the results confirmed that mergers and acquisitions generally appear to have both positive and negative effects on the profitability of industrial companies in the short term.

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Synergioita, globalisaatiota sekä yritysten tarvetta ylläpitää asemaansa ja kilpailukykyään markkinoilla voidaan pitää kansainvälisten yritysjärjestelyiden tärkeimpinä motiiveina. Tilastojen mukaan rajat ylittävät fuusiot ja yrityskaupat lähtivät kasvuun maailmanlaajuisesti vuonna 2014. Kasvua voidaan pitää yritysten halukkuutena hyödyntää talouskasvun tuomaa tavaroiden ja palvelujen kysynnän kasvua. Rajat ylittäviä yrityskauppoja tehdään, jotta pääsy kansainvälisille markkinoille avautuisi, mikä puolestaan parantaa resurssien saatavuutta.

Vaikka markkinatilanne olisi suotuisa, se ei tarkoita, ettei sulautumiseen liittyisi riskejä. Useissa tutkimuksissa on esitetty, että yksi sulautumiseen liittyvistä riskeistä on kahden yrityksen onnistunut integroituminen. Sama koskee yrityskauppoja, joissa hankkijaosapuoli saa määräysvallan kohdeyrityksessä ja hankkijalla on päätäntävalta ostetun yhtiön reaali prosesseista. Haasteita voi syntyä, kun kaksi eri toimialaa tai kulttuuria edustavaa yritystä on yhdistyy. Yritysjärjestelyt eivät välttämättä onnistu, jos synergiaedut on yliarvioitu tai markkinoiden dynamiikassa tapahtuu ennalta-arvaamattomia muutoksia. Synergistisiä hyötyjä voi olla vaikea toteuttaa muuttuneeseen asiakaskuntaan liittyvien haasteiden vuoksi. Markkinoiden kiristynyt kilpailu voi myös olla uhkatekijä yritysten kannattavuudelle.

Tässä tutkielmassa rajat ylittävien yritysjärjestelyiden vaikutusta kannattavuuteen tutkittiin kvantitatiivisin menetelmin. Otos käsitti 505 euroalueeseen kuuluvaa teollisuusalan yritystä 13:sta maasta. Tutkimustulokset osoittivat, että teollisuusalalla toimivista yrityksistä tulee pääomavaltaisempia yritysjärjestelyiden seurauksena. Pääomaintensiivisyys luo markkinoille pääsyn esteitä ja siten ylläpitää kannattavuutta. Tämä näkyi yritysten keskimäärin parantuneina liikevoitto- ja käyttökateprosentteina, mutta toisaalta heikentyneenä liikevaihtona. Tämä vahvistaa aikaisempien tutkimusten tavoin sen, että kustannushyötyjen saaminen on helpompaa, kuin tulojen lisääminen. Yritysten nettotuotto prosentti oli keskimäärin heikentynyt, jolloin omistajien ja sijoittajien näkökulmasta yritysjärjestelyt eivät lyhyellä aikavälillä palvele heidän etujaan heikentyneen voitonjakokyvyn vuoksi. Lisäksi pääoman tuotto prosentti näytti heikentyvän yritysjärjestelyiden johdosta. Tilastollisten tulosten perusteella ei saatu näyttöä siitä, että rajat ylittävät yritysjärjestelyt vaikuttaisivat eri tavalla kannattavuuteen, kuin maan sisäiset kaupat. Tulosten perusteella voitiin kuitenkin vahvistaa, että fuusioilla ja yrityskaupoilla yleisesti näyttää olevan lyhyellä aikavälillä sekä positiivisia että kielteisiä vaikutuksia teollisuusyritysten kannattavuuteen.

1. Introduction

1.1 Background of the study

Mergers and acquisitions have increased their popularity and significance materially since 1996 and the trend has continued to the next century. Cross-border deals started to represent an increasing amount of M&As since the beginning of the 2000s. The development was mainly due to the European Union and disappearance of nationalistic barriers which laid the foundation to the common market structure and market area. (Bryer & Simensky 2002) Harmonization of international financial reporting standards across national boundaries happened before the phenomenon. Harmonization facilitated corporations' activities through better information and capital flow. (Aghimien 1999, 83-84.)

In 2007 came into force Regulation of the European Parliament and of the Council to measure statistically the level of globalization of member countries economy, the effect of the European Union's internal market on the business activities of member countries and the global competitiveness of enterprises (OSF 2018). This tells about the significance of internationalization for companies. Through improved financial possibilities companies have concentrated on growing their businesses and thus enhancing their competitive position by having better availability of resources. For a corporate firm achieving the highest possible as well as sustainably effective growth level is one of the fundamental objectives. Growth is one of the two main reasons behind mergers as well. (Rashid & Naeem 2016, 10; Bryer & Simensky 2002.)

Organic way of growing business is achieved internally in the company. It may require large investments which makes an internal way of growing slower and possibly riskier choice for a company. However, the modern economy has brought up short-term opportunities for companies that seek to achieve competitive goals. By mergers and acquisitions, a company can get access to necessary resources without investments that can pay itself back over a longer period of time. Expansion of sales and assets can thus be gained through different strategies one of which is inorganic growth where a company creates new business opportunities by mergers, acquisitions, spin-offs, take-overs, etc. (Rashid & Naeem 2016, 10; Bryer & Simensky 2002.)

Not only M&As provide an alternative for other financing options, but they may also increase the value of a company, offer greater market share and cost efficiency. Two companies as combined yields a more valuable entity than two independent firms. This has been perceived as a certain kind of buffer for the future from the point of view of remaining competitive position in the dynamic global market. This phenomenon can be seen to create synergistic benefits which are the other main motive for M&As. Synergies come from lower per-unit costs, revenue enhancement or both. Cost benefits, in turn, can be gained through eliminated duplicate cost factors that can be related to research and development costs, personnel or overhead costs. In order M&As to be wealth creating pre-acquisition screening of the target company should be made properly. (Bryer & Simensky 2002; Collan & Kinnunen 2011, 118; Jallow et al. 2017, 75; Shukla et al. 2010, 45.)

Cross-border mergers and acquisitions can be seen as an important strategical solution for international corporations. Despite the huge possibilities of mergers and acquisitions, it has been provided evidence indicating that companies may overlook for instance the marketing synergies. This is because enhancing revenue is the more difficult way of realizing synergistic benefits. A company can believe that the use of the other company's customer base or that the combination of company A's research activity and company B's marketing resources would generate significant additional revenue. (Ferrer 2012, 35; Bryer & Simensky 2002.)

Overestimating the benefits of business combinations and their effects on profitability may thus lead to negative consequences of M&As. Problems in integrating two companies can turn expected gains of the transaction less efficient and thus weaken the profitability as well. Problems may arise from poorly conducted pre-M&A synergy evaluation which is crucial for the success of the deal. Based on the survey of KPMG it has been stated that by doing pre-M&A screening in a sensible way the probability of gaining positive effects from it increases by 28%. (Bryer & Simensky 2002; Collan & Kinnunen 2011, 118.)

The subject of M&A's effect on companies' financial performance is widely studied. The emphasis has most often been on the comparison of M&As' effect on pre-merger and post-merger period's profitability or efficiency. Many studies have dealt with the influence of M&A's on a performance of merged/acquirer company in some country or continent. There are also lots of studies concentrating on the same theme limiting the research to some specific industry.

Separation of the concepts of cross-border merger and domestic merger has been done as well because an increasing number of mergers occur across borders (Neary 2004, 2). Some of the authors (Blonigen & Pierce 2016, 2; Neary 2004, 2) that have studied mergers and acquisitions have found that previous studies of M&As concentrate on the consequences of them in certain situations. Findings of these studies have been based on individual cases when those studies cannot be used to explain the phenomenon generally (Blonigen & Pierce 2016, 2, 5).

Rashid & Naeem (2016, 11) present in their paper different observations from studies related to M&A's impact on companies' performance. They conclude that previous studies have proven contradictory research results about the effects of mergers and acquisitions on a company's performance and profitability. Theory of Beena (2000) advocates the idea of increased profitability of the merged/acquirer firms based on improved efficiency or monopoly position. From the managerial theory's point of view merged/acquirer firms' financial position would, in turn, be worse after deal-making. Rashid & Naeem (2016, 11) also bring out the finding that there are studies proving that M&A's don't have a significant influence on a company's financial performance. (Rashid & Naeem 2016, 11.) Jallow et al. (2017, 74-75) gained through their study this kind of outcome showing that net profit margin, unlike ROA, ROE and EPS, wasn't affected by M&As.

Valouch et al. (2015, 410) have studied M&A's effect of companies' profitability and returns with a post-merger period of three years. Like many other studies this one also seeks to find out whether the goals of mergers are met. The way that the approach of the study differs from others is its emphasis which is on the size of the merged companies. Thus, the study aims to answer the research question in a way that could be applied more widely. In the end, the conclusion of the authors was that it's more likely to larger companies to gain positive effects from merger, unlike their smaller counterparts. Despite not all the results were statistically significant they provided utilizable perspectives for further research with a different setting. (Valouch et al. 2015, 410-417.)

Davidsson et al. (2002) discussed firm size among other factors to determine business growth. The authors used results from previous studies as a basis for their further research with Swedish data. The authors conclude that larger firms' growth rates are smaller than the growth of newly formed firms. At least a number of employees have been mentioned as a used factor of business

size in studies described by the authors. (Davidsson et al. 2002, 332-335.) Thus, it has been suggested that small company size indicates a higher growth rate than a larger company. This is understandable because of the need for startup firms to achieve a certain size in order to survive and grow (Davidsson et al. 2002, 334-335). On the other hand, there's some evidence (Valouch et al. 2015) about larger companies gaining more positive effects and better profitability from mergers which usually aim to grow.

To sum up existing research information there have been issues associated with generalizability, contradiction as well as the significance of results about the effects of M&As on profitability. According to the paper of Davidsson et al. (2002, 334), there are findings that the industrial sector affects the growth rate of the company which, in turn, is proven to be significant when it comes to its profitability. There are many studies related to industrial sector providing a good basis for further research. Therefore, it's interesting and beneficial to conduct research with the setting of several comparable industrial sectors that share similar characteristics when it comes to the company's capital structure. Capital intensity has been related to a firm's ability to maintain its profitability due to entry barriers of the market (Bhuyan 2002, 69).

1.2 The purpose and objectives of the study

The purpose of this research is to gain an answer to the main research question: "Do cross-border mergers and acquisitions have an impact on the profitability of industrial companies?". Sub-question of the research is "How do cross-border mergers and acquisitions affect profitability?". An emphasis of the study is on the figures of an acquirer company, so the research is conducted from this point of view. Unlike many other studies, this one focuses on the post-M&A performance in terms of statistical tests. This is due to the fact that synergies and value creation are both obtained after the acquisition and the strategy have executed (Collan & Kinnunen 2011, 118).

The theoretical part of this paper starts with a description of the key terms of this work. The aim is to familiarize with the key issues that are used in the empirical study of this paper. It will be explained the motives for choosing a firm's total assets, operating revenue and growth percent as explanatory variables determining the size of a company. Measures of profitability used in empirical research will also be presented. More detailed information about the variables,

data, study setting, reliability and validity of the study as well as data collection is described in the third section.

In the literature review, the main goal is to be familiarized with the previous studies in order to get an understanding about what kind of findings have already been done related to the theme and what should be studied further. In the empirical part of this paper, the objective is to conduct quantitative research, discuss obtained results and whether they provide enough supporting evidence for solving the research problem. Ultimately, the aim is to find out whether a cross-border merger and acquisition affect industrial company's profitability. The fourth chapter presents the research results and the interpretation of them.

The research question will be addressed by conducted statistical tests that would show whether there is a statistically significant connection between acquirer companies' profitability ratios and cross-border mergers or not. In the fifth chapter, the research results are discussed not only from the point of view of their statistical significance but also reflecting them on previous research results. The last section of this work concludes the main findings of the empirical as well as theoretical part of the study. In addition, it is discussed the possible further research settings and issues that would be of interest based on the conclusions of this paper.

Independent variables of the study are margins of EBITDA, EBIT and Profit after tax as well Return on Assets. All these variables are measures of profitability and some of them have been used widely in other studies related to the theme. Explanatory variables include the dummy variable determining whether the completed transaction is cross-border or not, operating revenue or total assets, growth percent, and capital intensity ratio. Because merger or acquisition as a mere transaction doesn't necessarily affect a firm's profitability the explanatory variables have been chosen based on the factors that determine the size, growth and capital intensity of a company.

Operating revenue, as well as total assets, represent companies' scope of activities in a best and comparable way because of which they were selected first. Growth rate as an explanatory variable has been included in the regression equation because it describes more accurately the growth that has happened between the post-deal and pre-deal period. Capital intensity ratio, in turn, describes the nature of the key entry barrier for companies performing in the industrial sector where large investments are required. Therefore, the results of regressions represent the

joint effect of cross-border M&As, the size, growth and capital intensity on the company's profitability ratios.

After presenting the key terms in the following chapter it can already be stated that the study setting is relatively complicated because of the chosen variables. In addition to the nature of both the dependent and independent variables, other problematics related to intangible assets makes analyzing the results of statistical tests undoubtedly more complicated. Therefore, the expectation for the empirical study is that it doesn't necessarily provide unambiguous results. On the other hand, the objective is that obtained outcomes can be studied further as well.

2. Mergers and Acquisitions

2.1 Key terms

2.1.1 Cross-border mergers and acquisitions

There are a number of ways in which acquisition or merger can be recognized. The way in which the transaction is carried out is influenced by tax, economic and corporate reasons. At its simplest, shares in another company are acquired, whereby the acquired company becomes a subsidiary of the acquirer. It is also possible to acquire a business directly or to set up a completely new company to which all parties transfer their net assets. (Haaramo et al. 2016.)

Cross-border merger differs from the national merger by involving both domestic and foreign companies in the merger. There may be one or more domestic and foreign companies. According to the Finnish Companies Act, companies may also participate in cross-border mergers from more than two countries. The cross-border merger may be any of the mergers of Companies Act (2006) 16:1 and 2. Cross-border mergers can thus be absorption merger, combination merger, subsidiary merger or tripartite merger. (Mähönen & Villa 2012, 619-620.)

Legal effects of a cross-border merger registration to Finland are regulated in the 16th chapter of Companies Act (Companies Act 2006, 16:16, 16:27.1). The cross-border merger directive provides for more detailed provisions on cross-border mergers (Mähönen & Villa 2012, 556). The assets and liabilities of the merging company will be transferred without liquidation process to the receiving company which is registered to another country. Simultaneously, a merging Finnish company will be dissolved and the receiving company will be created when the execution of the merger is registered. Shareholders of the merging company and holders of the stock options and other special rights entitling to the shares will be entitled to the merger consideration in accordance with the merger plan. (Mähönen & Villa 2012, 628-629.)

The rights and obligations of merging companies based on employment contracts or employment relationships in force on the date of the merger will be transferred to the receiving company on the date of the merger's entry into force. The merger shall take effect in accordance with the law of the state of which the receiving company belongs. The legal effect of the cross-border merger registration in Finland thus corresponds to the national merger. Implementation

is registered in Finland at the time of entry into force of a cross-border merger. The shares of the merging company owned by the merging company do not entitle for the merger consideration. (Mähönen & Villa 2012, 628-629; Companies Act 2006, 16:27.2.)

In the case of a combination merger, the receiving company may be located in a country other than merging companies (Companies Act 16:19.3). The tripartite merger which is not recognized in all EEA countries requires that the arrangement may also be implemented in those states under whose law the merging companies or the giver of merger consideration are subject. Combination merger makes it possible to choose the domicile of a company quite freely. The domicile doesn't need to be in contact with merging companies. Thus, two foreign companies can merge and establish a Finnish company, for example. (Mähönen & Villa 2012, 619-620.)

A cross-border merger is only permitted under the Companies Act with a foreign company registered in another EEA country and subject to the legislation of another EEA country based on the location of the company's domicile, central administration or principal place of business. Reference rule of The Companies Act states that a foreign subsidiary can merge with a Finnish parent company and a Finnish subsidiary to a foreign parent company. (Mähönen & Villa 2012, 620-621; Companies Act 2006, 16:9.1-2.)

In addition, a Finnish company may merge with a foreign legal entity owning all shares in a limited liability company, which is treated as a Finnish cooperative, a cooperative bank, a savings bank or a mutual insurance company registered in another EEA country and subject to the legislation of another EEA country. Both for the merging Finnish company and the acquiring foreign legal entity it is applied the regulation in Companies Act Chapter 16, which provides for a cross-border merger. (Mähönen & Villa 2012, 620-621; Companies Act 2006, 16:20.1-2.)

2.1.2 Measures of profitability

One of the key operating condition for a successful business is profitability. There are several key figures representing the profitability of a company. Profitability ratios can be fully based on the numbers of profit and loss statement or they can be formed with both information from

the P&L and balance sheet. A margin of earnings before interest, taxes, depreciation, and amortization (EBITDA) provides information about a firm's ability to make a profit before costs of financial activities and wear and tear of fixed assets. The first intermediate result of the profit and loss statement is earnings before interest and taxes (EBIT) which is equal to operating result. EBIT shows the operating income adjusted with total costs as well as costs of wear and tear of fixed assets. The final ratio before profit before extraordinary items is net profit representing the net income adjusted with financial costs and taxes. (Alma Talent 2018.)

The EBITDA can be calculated by adding depreciation and amortization to the operating result. The EBITDA margin is affected by a firm's capital structure as well as the nature of competition and industry. In addition, the fact that if a company owns its means of production the absence of depreciation cost makes the ratio higher compared to a firm leasing them when lease costs are included in other operational costs. Interpretation can be based on the point of view of the adequacy of the EBITDA when it comes to borrowing costs, taxes, investments, and profit distribution. (Alma Talent 2018.) In the empirical study, all the sum of margins has been divided with operating revenue in order to get comparable ratios for regression analyses.

Return on assets is a measure telling about the profitability of capital that is committed to the company's activity. Return on assets may vary materially and depend highly on the industry due to fiscal and tax policy. Thus, in order to use ratio in a comparable way results should be either compared against similar company's ROA or use the form of formula that eliminates the influence of company's tax payment policy as well as taxation technique related to company form. Proceeding this way formula is formed in the following way: $\text{net income} + \text{financial expenses} + \text{tax} / \text{adjusted average balance sheet total}$. The other way of measuring a firm's capability to accumulate profit in relation to its total assets can be done simply by dividing a company's net income with its average total assets. The result generally indicates how efficiently a company's management uses its assets to generate earnings. (Alma Talent 2018; Investopedia 2018a.)

2.1.3 Key figures of firm size

The scope of a company's activities can be determined through several different ways depending on the desired point of view. In addition, it is determined in the Accounting Act (1997, 1:4a-c) that balance sheet total, operating revenue/turnover and the number of employees during the financial year are the key figures determining the size of a company. Operating revenue tells about the volume of activities and turnover can be compared against other companies. However, the structure of a company, as well as inflation and changes in the recognition of revenue in different years and among companies, should be taken into consideration. Thus, the comparable amount of turnover is vital when estimating its development of the same business entity's operating revenue. Depending on the industry the operating revenue may also be formed of large one-time deliveries the delivery of which has lasted more than one financial year. (Alma Talent 2018.)

Growth percentage of turnover is a ratio reflecting the growth development of a firm. In addition to the success of sales, the ratio can be influenced by the acquisition of a business, or group company's business transfer causing increase or decline due to selling a business. The rate of growth not only depends highly on the development of the industry but also the regional competitive situation may affect. (Alma Talent 2018.)

Balance sheet total describes the amount of capital that is committed to the company's operations. The first side of the balance sheet is the sum of the company's assets and the other represents the sum of equity and liabilities of the company. The total sum of both sides is equal. Balance sheet total measures the firm size because of the fact that committed capital grows as the company's activity expands. In the industrial sector and other capital intensive industries the balance sheet total can be substantial. This can be explained through double-entry bookkeeping where a debit in one account offsets a credit in another. This means, for instance, that credits increase revenue in the profit and loss accounts while debits increase the asset side of the balance sheet with accounts receivable. Investments, in turn, can expand both sides of balance sheet increasing the asset side with the non-current asset as well as the liability side with long-term debt. The counter entry of the long-term investment can, however, be in expenses in the profit and loss statement if it's leased. (Alma Talent 2018; Investopedia 2018b.)

2.2 Possibilities and risks of cross-border M&As

Companies planning and conducting mergers and acquisitions can have different motives for doing them. Many times they are used as an expansion strategy (Bryer & Simensky 2002, 1.4-1.5). If the primary motive isn't to expand but for example to diversify risks and enter the new market, risks associated with entry barriers have to be taken into account. On the other hand, the company may want to create entry barriers to prevent excess competition and sustain the profitability of its business. (Porter 1979, 137-138.) Whatever the goal of the M&A is, existing and possible future competition should be considered in the strategy and decision-making.

One of the most significant determinants for almost any company in the private sector is the degree and nature of competition. According to Porter (1979, 137), there are five forces determining the competition of an industry. A threat of new entrants, bargaining power of customers, bargaining power of suppliers, threat of substitutive products and services and finally competition among current contestants. The combined strength of the forces formulates the potential of profits in an industry. When understanding these forces of industrial competition companies can find a way of taking advantage of them. (Porter 1979, 137.)

A corporate firm that finds market situation too risky it has several strategical options to conduct. It can, for instance, diversify competition related risks by expanding its activities to new segments, capture economies of scope or scale, internalize externalities based on the make-or-buy decision or assure market position or buyer. (Porter 1979, 137,141; Bhuyan 2002, 61-62; Besanko et al. 2009, 120.) Many of above-mentioned strategical moves can be conducted through M&As which explains the popularity of them. There are several ways for companies to avoid excess competition by creating barriers to that are high enough for new entrants. The scale of economies in production is mentioned to be a key barrier to entry. A new entrant has to enter the market either on a large scale or settle with a cost disadvantage. The disadvantage to the potential rivals can also occur due to the lack of available resources. (Porter 1979, 137-139.)

Another important barrier to entry is product differentiation that can be achieved through strong brand and customer loyalty that a potential competitor has to overcome. The importance of product differentiation as a barrier to entry, however, depends on the industry. As mentioned earlier in this paper, capital intensity can form a key barrier to entry for companies performing

in the sectors that require large investments. The especially massive research and development activities and learning profits can create a crucial barrier for new entrants. In addition to resources, a new entrant needs access to distribution channels which can be one of the barriers for entering the market. (Porter 1979, 138-139.)

2.3 Trend in deal making 2012-2017

According to history, mergers tend to occur at the time when the economy expands and on the other hand, merger waves slow down alongside the market. The increase in mergers is due to companies' willingness to take advantage of the economic growth that brings increased demand for goods and services. As the economy slows down expansion strategies are based on other choices than M&As because of the stock market's uncertainty. (Bryer & Simensky 2002, 1.4.)

From figure 1 it can be noticed that the popularity of cross-border mergers and acquisitions have significantly increased during 2013-2017. In 2012 cross-border M&As were driven by industrial as well as consumer staples sectors comprising 42% of all deals crossing national boundaries. In the next year, overall M&A volume decreased 18% which can be seen from the figure. Energy and power represented the biggest share of deals in the industrial sector between 2012-2013. A share of public equity companies in worldwide deal making between the same period of time has been slightly bigger than private equity increasing 22% from 2012. (Thomson Reuters 2019.)

The number of cross-border deals was 31% of overall M&As. In 2014 worldwide deal making volume grew almost 50% due to the increase in both by the quantity and value of deals being the strongest annual period since 2007. When it comes to European targets M&A activity increased over 50% from 2013. Energy and Power M&As represented 66% and healthcare sector even 94% increase based on the value of deals. Cross-border deals, in turn, increased 78% from 2013 and accounted for 37% of total M&A activity. (Thomson Reuters 2019.)

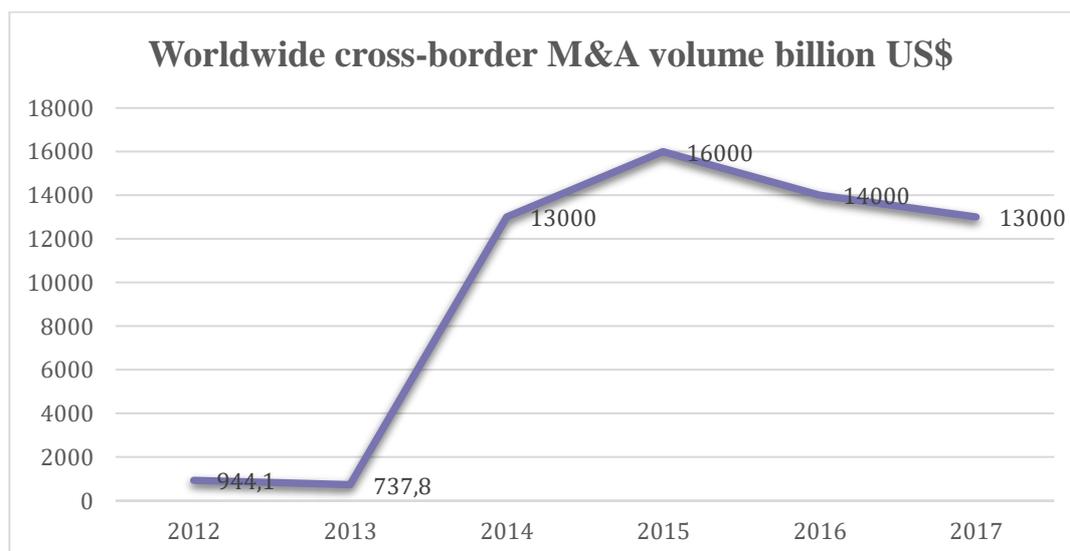


Figure 1. The trend in cross-border M&As (Figure produced by the author, numbers produced by Thomson Reuters 2019.)

During 2015 worldwide M&As in general increased 42% from the previous year. M&As targeting to U.S. companies increased a lot being the strongest period for the M&A activity of the United States since 1980. Asia Pacific M&A activity broke the record as well. From a worldwide point of view, the pharmaceutical industry accounted for a 71% increase in deal-making. The activity of the energy and power sector remained at the same level compared to the previous year. Technology, in turn, doubled the volume of M&As in 2015. When it comes to cross-border deals they totaled even US \$1,6 trillion accounted for one-third of all mergers and acquisitions and is the highest amount of deals between 2012-2017. (Thomson Reuters 2019.)

In 2016 the number of announced deals slightly increased remaining still at the same level than in the previous year. Despite the level of announced deals M&As globally decreased by 16% based on the value of them. M&As for the U.S. and the Asia Pacific targets decreased compared to an exceptional year's level of activity. Deals targeted to European companies accounted for 21% of worldwide M&As in 2016. M&A activity in the Energy and Power sector increased by 15% compared to the level of the previous year. Deal-making in the sector of technology, in turn, fell 15% when it comes to the value of deals. Half of 12 major industry sectors accounted individually for at least 10% of M&As in 2016. Cross-border deal making accounted for 38% of all M&As being the highest percentage since 2008. (Thomson Reuters 2019.)

Number of announced deals during 2017 broke the records being 49 448 worldwide. Cross-border dealmaking fell to the level of 2014 despite M&A activity in the U.S. with a number of deals and intra-Europe deals increased 17% from 2016. Sectors of Energy & Power, as well as Technology, accounted for 13% of all M&As during 2017. Deal-making in the industrial sector represented 12% of overall M&A activity. Deals in Real Estate sector went up 47% and Materials and Media M&As fell 46% and 21% respectively compared to the level of the previous year. (Thomson Reuters 2019.)

2.4 Authority over business

The scope of the IFRS 3 standard includes acquisitions in which one party acquires a business, businesses or shares of the business company and gets authority of the acquired business. Business, in turn, is determined as a set of interrelated activities and assets that can be managed aiming to give the investors, other owners, members or participants profit as a dividend, cost reduction, or as other financial benefits. Thus, elements as input, output and related processes are present. An acquisition falls within the scope of the standard if the acquirer of business has authority over the investee, is exposed or entitled to a variable return on the investment and has the opportunity to exercise power and influence the amount of income it receives. When determining the existence of the authority, all the facts and circumstances have to be taken into consideration. Assessment is mainly based on the principles instead of some specific limits. (Haaramo et al. 2016.)

The acquirer company can exercise authority in various ways. At its simplest, authority over the other company is achieved by acquiring more than half of the voting power of another company. In other cases, it will arise even if not acquired more than half of the voting power of the item. This may be the case, for example, when less than half of the voting rights are acquired, but under the shareholder agreement, voting rights are exercised by a board that directs the business of the company. (Haaramo et al. 2016.)

2.5 Effect of goodwill on financial statements

Since mandatory International Financial Reporting Standards (IFRS) introduced 2005 they have sought to provide a unique and high-quality set of international accounting standards for users of financial statements. The standards proposed by the International Accounting Standards Board (IASB) offer a comprehensive and broad range of accurately set standards. These standards are widely used internationally. (Gatsios et al. 2016.) IFRS norms regulate international accounting information either as mandatory or optional in 137 countries. For listed EU companies application of IFRS standards is mandatory. IFRS norms include the basics of preparation and presentation of financial statements, International Financial Reporting Standards (IFRS) and IFRIC Interpretation guidelines. (Haaramo et al. 2016.)

IFRS standards consist of three parts including a conceptual framework for the preparation and presentation of financial statements, IFRS standards, which was formerly IAS, International Accounting Standards and Interpretation Guidelines. The basics take a stand on the objectives of the financial statements' information such as qualitative characteristics, as well as the usefulness of financial statements information, the underlying assumptions of the preparation and the fundamentals of the financial statements. In addition, they give instructions about the valuation, the capital, the accounting policies. (Haaramo et al. 2016.)

It has been found some differences associated with net income adjustments among European countries. One of the differences is related to IFRS 3 requiring the use of the acquisition method in accounting for all business combinations, capitalization of goodwill without amortization. The standard also requires testing for goodwill impairment at least annually. If the value of goodwill has risen, then there will not be accounting recognition. If the value of goodwill has declined, then the firm must write down the impairment. (Giacomino & Akers 2009, 9.) On the other hand, in many European countries, domestic standards are applied permitting pooling-of-interests accounting for particular business combinations and required amortization of goodwill arising from business combinations accounted for using the acquisition method. (Barth et al. 2014, 298.)

Horton and Serafeim (2010) have examined the value relevance of net income and equity book value adjustments among large non-financial UK firms. Authors found that the coefficient on

the aggregate net income adjustment is significantly positive. The net income adjusted in accordance with IFRS 3 and applying the impairment is more value relevant than amortization. This is because of the key feature of standard regulating goodwill to be written down when impaired rather than be amortized systematically over time, whereas goodwill was amortized in accordance with domestic standards for several English and Scandinavian countries. (Barth et al. 2014, 304, 322.)

Thus, we can conclude that it is possible that some European countries may still apply domestic standards instead of international ones when it comes to depreciation and impairment of goodwill. Giner & Pardo (2014) studied impairment decisions of managers of Spanish listed companies. Their results suggested that managers exercise consideration when reporting goodwill impairment losses. Smoothing strategies influence decisions regarding goodwill impairment and the magnitude of the impairment. (Giner & Pardo 2014, 36.) It has also been found that the impact of goodwill impairments on the balance sheet and income statement is significant. The study by Sevin and Schroeder conducted in 2005 shows that goodwill impairments among sample firms in 2002 were equal to 7,2 percent of assets and 8,9 percent of sales. (Giacomino & Akers 2009, 10.) Goodwill related to profit and loss statement, as well as balance sheet items may thus affect significantly to the post-merger key figures of the fiscal year.

2.5.1 Capitalization of goodwill

Goodwill arises when the total value of the acquired item exceeds the fair value of acquiree's net assets. Goodwill should be capitalized as a separate intangible asset in the balance sheet. The goodwill arising from the acquisition includes two types of items. Firstly, it includes intangible assets that are not identifiable or that are not controlled by the entity in accordance with IAS 38. Secondly, it includes purely management expectations of the future earnings potential of that target or the expected cost savings from the potential synergy generated by the association. (Haaramo et al. 2016.) In figure 2 it is illustrated the determination of goodwill. To conclude the illustration, goodwill is a difference between a sum of consideration handed over, the potential share of non-controlling interests in the target, equity component of the target and the net amount of acquired assets and liabilities assumed at the acquisition date. All the aforementioned items should be valued in accordance with IFRS 3. (St-Akatemia 2018, 163.)

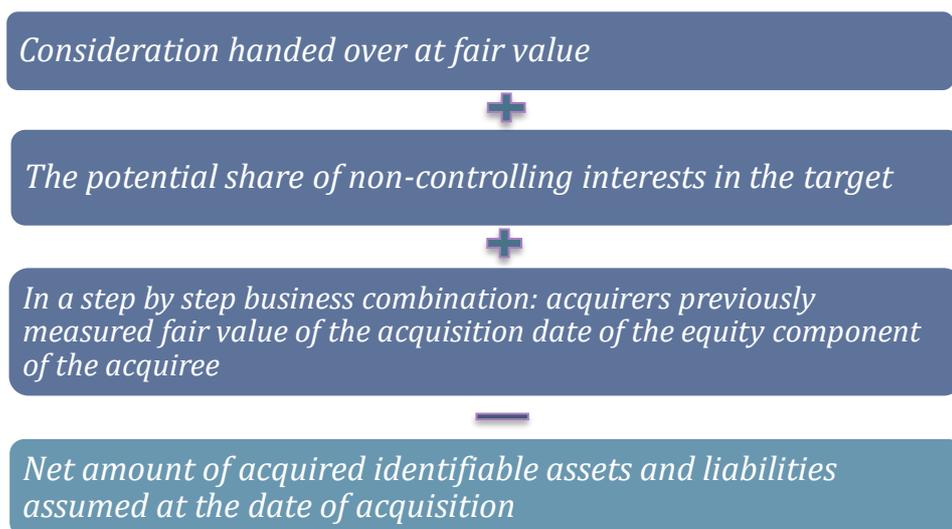


Figure 2. Determination of goodwill (St-Akatemia 2018, 163, figure produced by the author)

Goodwill is an asset that is integrated into a cash-generating unit under IAS 36. Therefore, after the acquisition, the cost of goodwill is not amortized but it's adjusted for impairment losses in accordance with IAS 36. The carrying amount of goodwill is tested for impairment annually using an impairment test. The amount of goodwill is reduced through impairment as the benefits of the business combination accrue to the entity. The accumulation of benefits may be due to general synergy benefits or the use of intangible assets that cannot be separated from goodwill. (Haaramo et al. 2016.)

According to the conclusion of Giacomino & Akers (2009, 11-12) previous studies as well as their examination of corporate financial statements, it can be seen that in 2006 there were in many corporates' balance sheet substantial amounts of goodwill impairment. Another finding was that before impairing the goodwill it was noted that the goodwill exceeded the net income recognized in the most recent accounting period. The authors found as well that in some cases sample firm's goodwill-to-net income ratio was multiple meaning that with the most recent earnings level when impairing goodwill completely it would take out the income from three years. (Giacomino & Akers 2009, 11-12) The sample that was collected from UK companies shows how big amount of goodwill can equal the balance sheet and which order of magnitude goodwill write-downs can represent.

Goodwill impairment should be accounted if a company finds valid evidence that the goodwill can't demonstrate financial results anymore and the value related to acquired assets are lower than originally was paid for. In the case of goodwill, the decrease in fair value of expected cash flows would mean the need for impairment. Goodwill impairment may indicate the success of the merger or acquisition by messaging that expected returns from the deal will not be generated as planned. (Investopedia 2019a; Investopedia 2019b.)

2.5.2 Problematics of intangible assets

At the time of acquisition, all the acquired assets and liabilities should be valued at fair value from the point of view of market participants. When it comes to step-by-step acquisitions, the amount of goodwill will be determined only once when the authority over the acquired company transfers. There is a requirement to identify assets in order to separate them from goodwill. This may result in the accounting of intangible assets that were not at the balance sheet of the target before the acquisition. Thus, it's possible that intangible assets are accounted for more easily in the context of business acquisition under IFRS 3. (Haaramo et al. 2016.)

Problems related to the recording of intangible assets is due to the fact that, in the case of an acquisition under IFRS 3, the two requirements of IAS 38 for general recognition of an intangible asset are automatically satisfied. This is because of the fair value is always reliably determinable and future benefits accrue to the entity. Examples of intangible assets in IFRS 3 are brands, patents, or customer relationships. Because often the purchase is made at least partly because of the aforementioned factors or technology, accounting them separately gives better information about the acquisition as their own commodities. Non-separation would increase the amount of goodwill and give poorer information about the underlying motives behind the acquisition. (Haaramo et al. 2016.)

2.6 Previous evidence of the consequences of cross-border mergers and acquisitions

Blonigen & Pierce (2016, 2) have stated that cross-border mergers and acquisitions are a primary way for multinational firms to engage in foreign direct investments. In addition, cross-border mergers have for a long represented increasing proportion of all mergers (Neary 2004, 2). Motives for multinational M&As are seen to be related to diversification and integrating subsidiaries into the global market. Blonigen & Pierce (2016, 2) see that when it comes to M&A transactions the fundamental issue is the possibility that the deal may reinforce company's market power or bring efficiency gains but not necessarily both. Bhuyan (2002, 61-62) have stated that there is an established motivation for contract and ownership integration in enterprise performing in the production. The need for vertical integration comes from different stages of production and controlling inventory levels. When the processes of a firm are more closely coordinated transaction costs related to market exchange can be reduced and thus efficiency can be achieved. (Bhuyan 2002, 61-62; Blonigen & Pierce 2016, 2; Shukla 2010, 45-46.)

Improved profitability comes from the number of outputs which can be produced by fewer inputs. In addition to economies of scale that flow from larger post-M&A operations, authority over key inputs as well as rationalization related to production and distribution will probably improve productivity. Thus, better productivity and efficiency obtained through vertical integration are closely related to the profitability of a manufacturer. (Bhuyan 2002, 61-62; Shukla 2010, 45.) Rashid & Naeem (2017,10) brought out the perspective of M&As being a relevant growth strategy for a company through which it can inorganically expand its business, diversify its customer base and enhance its innovative activities by new product development. Even if the growth has been reached through merger it doesn't necessarily mean improved productivity or efficiency. Blonigen & Pierce (2016, 2-3) found that there is a statistically insignificant relation between M&As and average productivity in U.S. manufacturing firms.

When a company seeks to expand its activities and merge with a competitor by it can be called a horizontal transaction. On the other hand, if a company is a supplier merge with a buyer or distributor the deal is called a vertical transaction. If the target firm is from totally different industry the deal is said to be a conglomerate merger. (Bryer & Simensky 2002, 1.4-1.5.) Companies can have joint ownership with other businesses providing relationships and when crossing national boundaries enabling also access to international markets. Mergers and acquisitions may have either a positive or negative effect on growth rates by changing resource availability. Davidsson et al. (2002) state based on their research that there can be seen a relation between acquisition and increased growth of the acquired firm that was previously independent.

This can occur as a consequence of created synergy benefits. Acquisition of a parent company has been seen, in turn, to be related to decreased growth. (Davidsson et al. 2002, 337, 347.)

It has been proved that M&As play an important role when it comes to welfare. However, Blonigen & Pierce (2016, 2) claim that the effects of M&As for welfare are difficult to estimate empirically due to the separation of estimation related to market power and productivity effects. Case studies have obtained more detailed information based on specific circumstances but the problem lays in that the results haven't necessarily been generalizable. Most researchers have tried to explain cross-border mergers from the economical point of view as well. Those authors have discussed the issues based on the perspective of a single sector. (Blonigen & Pierce 2016, 2, 5; Neary 2004, 2.) Thus, we can conclude that when it comes to previous studies of M&As they provide information about M&As' consequences in certain situations. Expanding research to explain the phenomenon in general, in turn, is more difficult.

2.6.1 Size of a merged company and profitability

Size of business is widely studied factor to determine growth. It has been found that there is a negative relationship between firm size and the rate of growth. This suggests that the larger the firm is the lower its growth rate is. There are some authors that have found similar results when it comes to firm size being a negative explainer for growth. Some authors have used the number of employees as a determinant for business size. This has proven to be reasonable when studying newly formed companies and finding a positive correlation between startup size and growth. This kind of result has been found among new firms in the manufacturing sector in the U.S. Industrial sector, in turn, has an impact on what is the optimal growth level for a company. (Davidsson et al. 2002, 334-335.)

When discussing growth factors of business firms that in addition to the firm's size it has been found several determinants of growth. Davidsson et al. (2002, 332) utilized in their study existing research data to improve the study of the effects of industry, international versus domestic business and ownership. The authors proved in their paper that the studied factors that are presented in chapter 2.6.2 play the most important role in growing businesses. (Davidsson et al. 2002, 332.) As noted earlier, one of the main goals of mergers and acquisitions is to

achieve growth by expanding its activities. Looking at the independent variables that explain growth many of them are related to things that can change after mergers and acquisitions. A certain point of growth, in turn, is perceived to be vital for a firm that pursues profitability (Davidsson et al. 2002, 334).

Research by Valouch et al. (2015, 410-417) shows interesting observations about merged companies' earnings after tax (later EAT). The emphasis of this study is on the size of merged companies. The time period used is three years which was considered to be a sufficient period of time to evaluate the effect of the deals. Another thing that was taken into consideration was to minimize the possibility of certain accounting methods such as revaluation of assets or taxation issues that may affect financial statement numbers (Valouch et al. 2015, 412).

The study was conducted in three steps using the Wilcoxon matched pair test and the sample size was 312. At the first stage, they studied the impact of mergers on EAT on merged companies regardless of their size. The used null hypothesis was that the merger doesn't have an impact on the value of EAT of the merged company. Based on the statistically insignificant result the null hypothesis couldn't be rejected and the assumption stayed valid. (Valouch et al. 2015, 413-415.)

The second stage of the research was about examining whether the size of a merged company had an influence on EAT keeping the same time period than in the first stage. The null hypothesis was that the size of the company doesn't have an impact on the merger effect on EAT. Based on the result being statistically insignificant the merger effect on EAT is not due to the size of a merged company. At the last step, the same issue was tested but this time with a division of companies to categories based on their size. Again, the test didn't provide any significant result. (Valouch et al. 2015, 414-417.)

In all stages of the study, the results showed that the merger didn't have a statistically significant effect on the company's Earnings after tax. However, there were results close to reaching the chosen significance level. One of these cases was large companies after conducting the third step of the study by categorizing companies based on their total assets. Also, in the first test where probability was quite close to reaching the significance. Almost statistically significant results lead to the conclusion that mergers probably affect positively on EAT regardless of the size of a firm. Despite the results related to M&As effect on EAT, mergers effect on ROA was

proved to have a significant effect on the return on assets of large companies. Therefore, the conclusion of the authors was that mergers would more likely affect positively on large companies' profitability. (Valouch et al. 2015, 413-417, 421.)

2.6.2 Industrial sector and profitability

There can be seen a relation between productivity, efficiency, and profitability in the manufacturing sector. Blonigen & Pierce (2016, 2) combined in their study analysis of efficiency and market power in U.S. manufacturing industries to find out whether M&As have impacts on them. They state that a company can obtain efficiency gains by reallocation of production within the firm as well as rationalization of headquarter services. At the firm level efficiency can, thus, be achieved by closing down low-productivity plants and combining non-production activities. Despite the authors found significant evidence for increased markups due to M&As they didn't find significant results about firm-level average productivity effects related to M&As. (Blonigen & Pierce 2016, 6, 22-24.)

Davidsson et al. (2002) proved that the sector of business is a significant factor determining the growth of a firm. Growth, as mentioned earlier, has an influence on a company's profitability. There are several factors that mutually create the rate of growth. The authors developed the model that includes not only industrial sector but also for instance firm's age, business and overall enterprise size, legal form, ownership governance, international activities, location, etc. (Davidsson et al. 2002, 337-338.)

2.6.3 Research hypotheses

It's been tried to develop a model for scientifically approach and analyze pre and post-merger financial ratios. Authors, such as Leepsa and Mishra (2014) have studied factors affecting the performance of Indian manufacturing firms in the post-merger time period. They found that, for instance, the size of an acquirer company and industry relatedness, determine the fact that whether the merger will lead to success or failure. Based on the findings of previous studies Rashid & Naeem (2016, 16) used in their study multiple regression OLS model including some

of the same regressors than Leepsa and Mishra (2014) into it, such as the size. The study was about mergers effect on corporate performance and for profitability, the authors used Return on Assets and Profit Margin as dependent variables. (Rashid & Naeem 2016, 14.) Jallow et al. (2017, 76, 84), used ROA and Net profit margin as dependent variables in their study as well. They conducted a case study about the impact of M&As on UK companies' financial performance.

When it comes to size as an explanatory variable for the merger's impact on a company's performance, it has also been used by Valouch et. at (2015). Their study and findings were briefly presented in chapter 2.6.1 and they tested if Total assets as the firm size determinant had a significant effect on profitability and returns of Czech companies. Like many other authors they used Return on Assets as the dependent variable for profitability in their study. For returns Earnings after tax was used as the dependent variable. (Valouch et. at 2015, 414-419.)

As stated earlier in this paper, the productivity of a firm can be seen to be related to profitability due to cost efficiency gains. Blonigen & Pierce (2016) aimed to find evidence about the effects of mergers on market power and efficiency. They used in their regression model age, size and industry categories as explanatory variables for a productivity of plants. (Blonigen & Pierce 2016, 13-14.) As it has been brought up, industry-related indicators have their impact on post-merger performance as well. Bhuyan (2002, 68) studied the impact of a vertical merger on industry profitability in the manufacturing sector. The author used industry profitability as a dependent variable and several industry characteristics such as competition to determine the difference of entry conditions across industries. Competition matters to post-merger performance because of barriers to entry. When there are entry-barriers present in the industry or company, it has been seen to enhance profitability through higher profits. Therefore, an index, that was used by Bhuyan (2002, 69), that represent the capital intensity of a firm was included in this research as well. (Bhuyan 2002, 68.)

Based on the previous studies, the research problem of this thesis will be solved through the following null hypotheses:

1. $H_0 = \text{cross-border M\&As do not have a significant effect on EBITDA margin}$
2. $H_0 = \text{cross-border M\&As do not have a significant effect on EBIT margin}$
3. $H_0 = \text{cross-border M\&As do not have a significant effect on Profit after tax margin}$

4. $H_0 =$ cross-border M&As do not have a significant effect on Return on Assets

3. Data and research methods

3.1 Limitations of the research

The empirical study has been conducted with data based on the time frame between 2012-2017 and is limited to industrial companies due to the need for supplementary studies in that sector. Another major limitation of the study is a geographic area which concerns only the member countries of the European Union and countries whose currency is Euro. This limitation was done due to the need to exclude the implications of different accounting principles that would make study results incomparable. Thus, the material has been collected from acquirers using International Financial Reporting Standards (later IFRS). The research data has been collected from the Zephyr M&A deals database of mergers and acquisitions and is based on the consolidated financial statements of public limited liability companies.

3.2 Study setting and description of the data

The aim of the empirical part is to find out whether a merger and acquisition conducted in an international context affect industrial company's profitability. The causality between the post-M&A profitability ratios and explanatory variables is studied by quantitative methods. One of the first steps of the study was to design a proper regression model. The chosen regression model to use is Ordinary Least Square. With the results of multiple regression analyses, we can take a stand to the research questions: "Do cross-border M&As have an impact on profitability of acquirer companies in the industrial sector?" and "How do cross-border M&As affect profitability?". By doing several statistical tests using different combinations of explanatory variables and dependent variables and by observing joint effects, reliable conclusions concerning the research problem can be drawn. Regression equations used in this study are formed with different combinations of the following variables:

Dependent variables:

- *EBITDA margin*
- *EBIT margin/Operating margin*

- *Profit after tax margin*
- *Return on assets (ROA)*

Explanatory variables:

- *Post-deal operating revenue*
- *Post-deal total assets*
- *Growth percent*
- *Capital intensity ratio*
- *Dummy variable, 1 = cross-border deal, 0 = domestic deal*

Formulas of the variables are as following:

EBITDA margin:

Earnings before interest, taxes, depreciation and amortization / Operating revenue

EBIT margin:

Earnings before interest and taxes / Operating revenue

Profit after tax margin:

Earnings after taxes / Operating revenue

ROA:

(Net income + Financial expenses + Tax) / Total Assets

Growth percent:

(Post-deal operating revenue – Pre-deal operating revenue) / Pre-deal operating revenue

Capital intensity ratio:

Total assets / Operating revenue

3.1.1 Completed deals and types of the deals

In figure 3 it's illustrated the distribution of completed mergers and acquisitions between the time period of the study. The sample size totals 505 companies and the graph shows the number of deals made according to the first available financial statement after M&A in each year. It can be observed that most of the deals have been done in 2015.

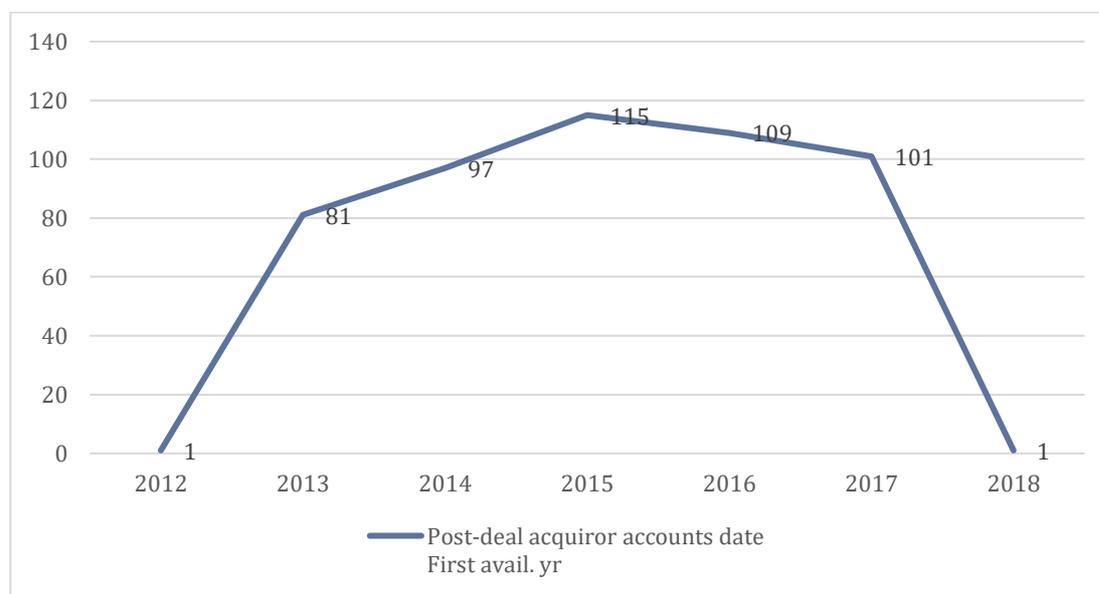


Figure 3. The number of completed deals 2012-2017

The distribution illustrates completed deals by numbers due to the fact that not all the deal values were available. Even though the data from quarterly reviews of Thomson Reuters Deals Intelligence included all the companies worldwide and the figure is based on the deal values, it can be compared to the figure 3. Both figures show clearly the popularity of cross-border M&As between 2015 and 2016. In addition, it can be observed that both figure 1 and 3 present the same kind of upward trend in deals from 2014 to 2015 and, on the other hand, a slight decline from 2015 to 2017.

Figure 4 illustrates the distribution of the deal types. It can be noticed that the majority of the completed deals are 100% acquisitions. However, both merger and acquisition will essentially involve a sale of shares, a sale of assets or combination of the two. From the European perspective, a private acquisition of shares is targeted by the buyer for continuing to run the target's business. In the case of a private acquisition of assets, the buyer acquires the assets of the target company.

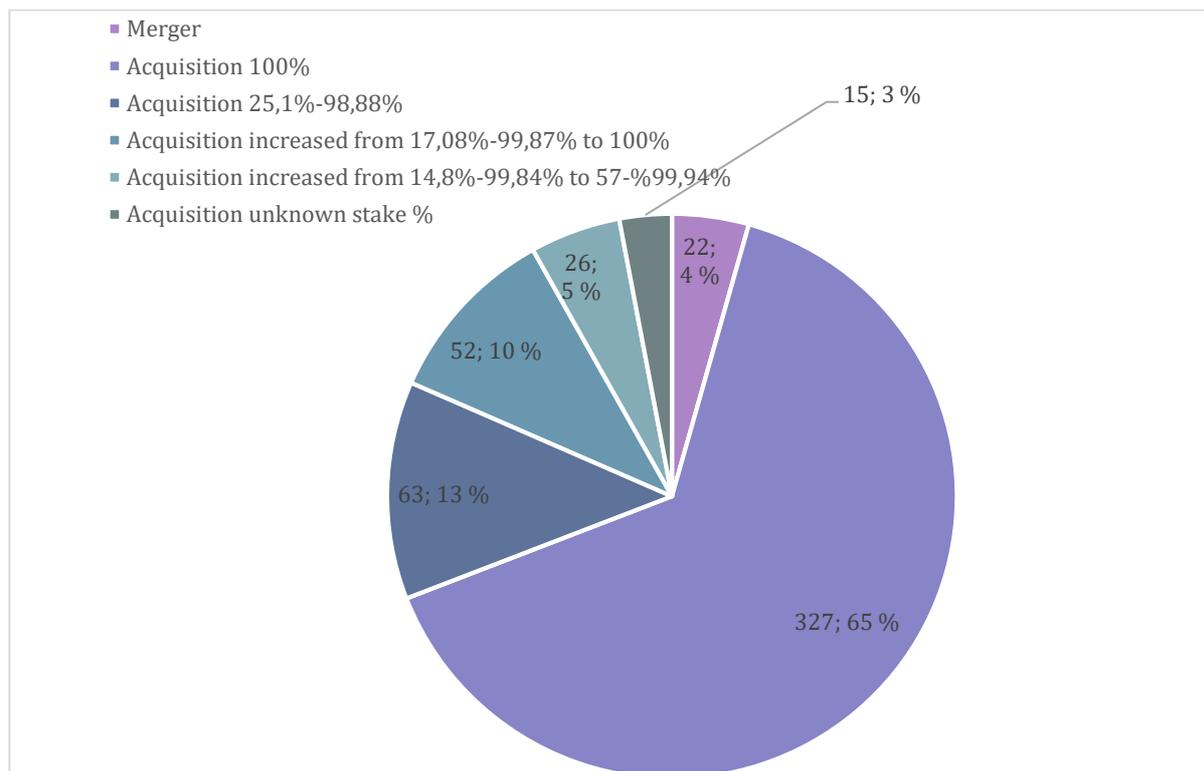


Figure 4. Deal types

In the case of acquisition of assets, each asset and intellectual property right (IPR) must be transferred as an assignment or granted by way of license. Acquisition of part of a business it's more complicated in terms of IPRs. This is due to the possibility that buyer wants to use some of the target company's IPRs in the part of a business that will retain to buyer's ownership. (Bryer & Simensky 2002.)

Based on figure 4 it can be stated that the majority of the completed deals in the research sample are 100% acquisitions. The second biggest part of the sample represent acquisitions that fall between 25,1% and 98,88%. 10% of the sample represents companies that have had previously at least 17,08% and a maximum of the target firm's shares and acquired the rest of the company's shares. 5% of the sample acquirer firms had at least 14,8% and a maximum of 99,84% of the target company's shares and increased the amount of ownership up between 57%- 99,94%. The fact that caused a little difficulty in the analysis was that there were no specifications in the Zephyr data whether some amount of those 100% acquisitions were mergers or not. Therefore, only those cases that were acquisitions without specified amounts of shares were considered as mergers that are only 4% of the data.

When it comes to merger it usually involves approximately the same sized companies. Like stated in the first part of the literature review, a merger can be recognized in various ways one of which is that shareholders of the merging firms exchange their shares for shares in a new holding company. The same principles that apply for private acquisition of shares and private acquisition of assets are hallmarks for mergers as well. In addition, it is possible for the merging companies to transfer their assets to a new company. Consequently, the two existing companies will be liquidated and this new company will issue the shares for shareholders. The third characteristic for the merger is to effect it by a scheme or arrangement. This usually is conducted when there are a significant number of shareholders and thus the other two options are not practicable. (Bryer & Simensky 2002.)

In figure 5 there is shown how the research data is distributed in terms of cross-border and domestic mergers and acquisitions. 308, that is the majority of the completed deals in Europe in the time period of the study, were targeted to some other country's company that applies IFRS standards. Thus, we can confirm the fact that cross-border M&As represent a significant amount, that is 61%, of all deals.

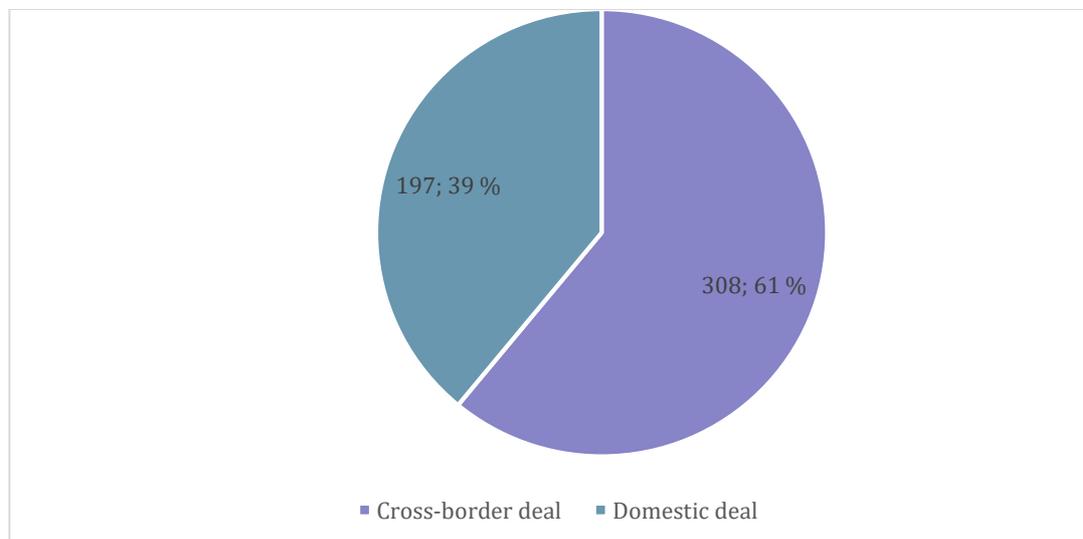


Figure 5. Number of cross-border deals

3.1.2 Industrial sectors

In previous sections, it has been found that there is a need for additional research when it comes to effects of M&As on companies' performance in the industrial sector. Therefore, it's been

chosen companies from the industrial machinery sector. In addition to the need for further research in the industrial sector, companies whose activity is mainly industrial production, manufacturing, gas, water & electricity or construction share, in principle, similar capital structure. The distribution of companies' industries is illustrated in figure 6.

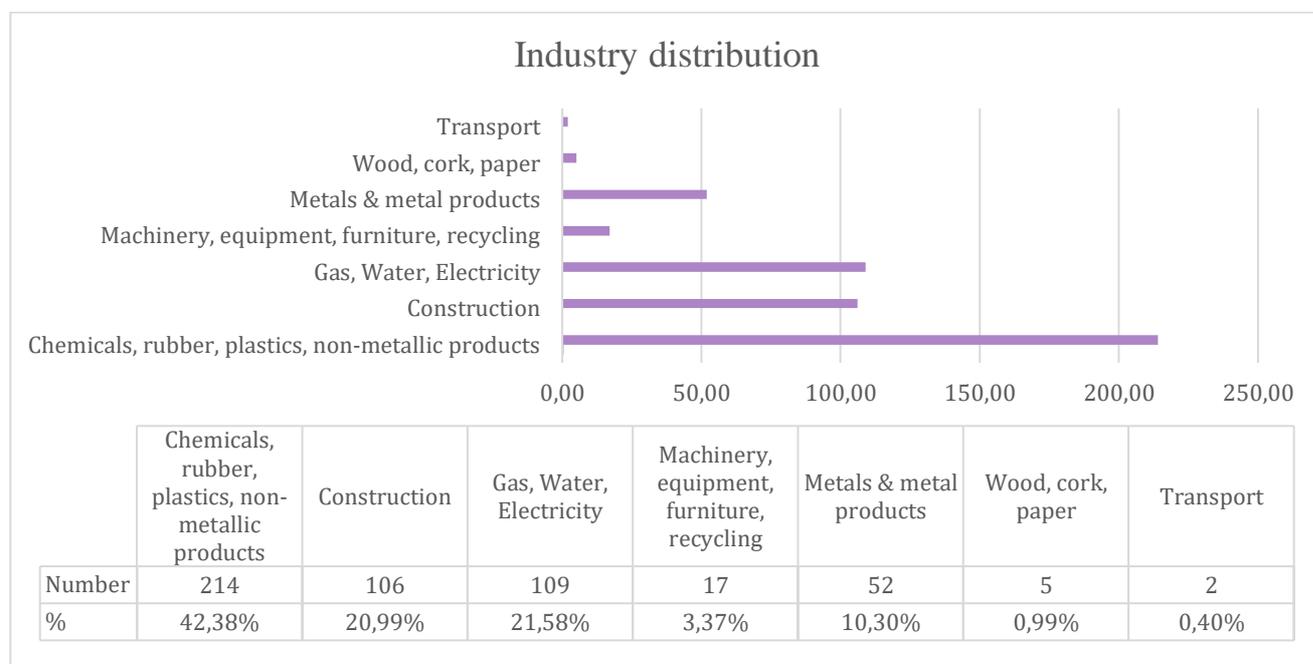


Figure 6. Major industrial sectors of acquirer companies

It can be seen that majority of the sample companies that have completed mergers and acquisitions in the industrial sector between 2012 and 2017 belong to the sector of chemicals, rubber, plastic, and non-metallic products. Other industries that have favored M&As perform in the field of construction and gas, water and electricity. According to the New York Times, the industrial machinery and equipment industry includes manufacturing companies engaged in industrial components such as hand tools and small-scale machinery. The industry consists of power saws, polishing and metal-working machines and other basic industrial equipment. Cables, batteries, motors, small and large-electrical equipment, conveyors and heavy generators are classified in electrical and heavy electrical equipment and components. Engineering and construction include permanently installed machinery. (New York Times 2018.)

3.1.3 Geographic area

The research data consists of 13 European Union countries. The geographic area was limited to the EU due to the common accounting principles IFRS. Differences among accounting policies are related to fiscal, financial and cultural variabilities as well as creditors' needs instead of equity investors. Thus, the fundamentals of principles are based on the needs of the majority of financial statements' users which differ, for instance, between the U.S. and Europe. It has been found evidence about material differences between US GAAP and International Accounting Principles. The most significant differences were found in amortization of goodwill and provision for deferred taxation. (Adams. et al. 1990, 1-2.)

An illustration in figure 7 shows that 53,07% percent of the sample countries belong to France and Germany. Rest of the countries represent individually less than 12,08%. There are probably many factors explaining why those two countries have completed the biggest number of mergers and acquisitions in the industrial sector between 2012-2017. One of the explanations could be faster recovery after the financial crisis that improved the economic situation and capital flow.

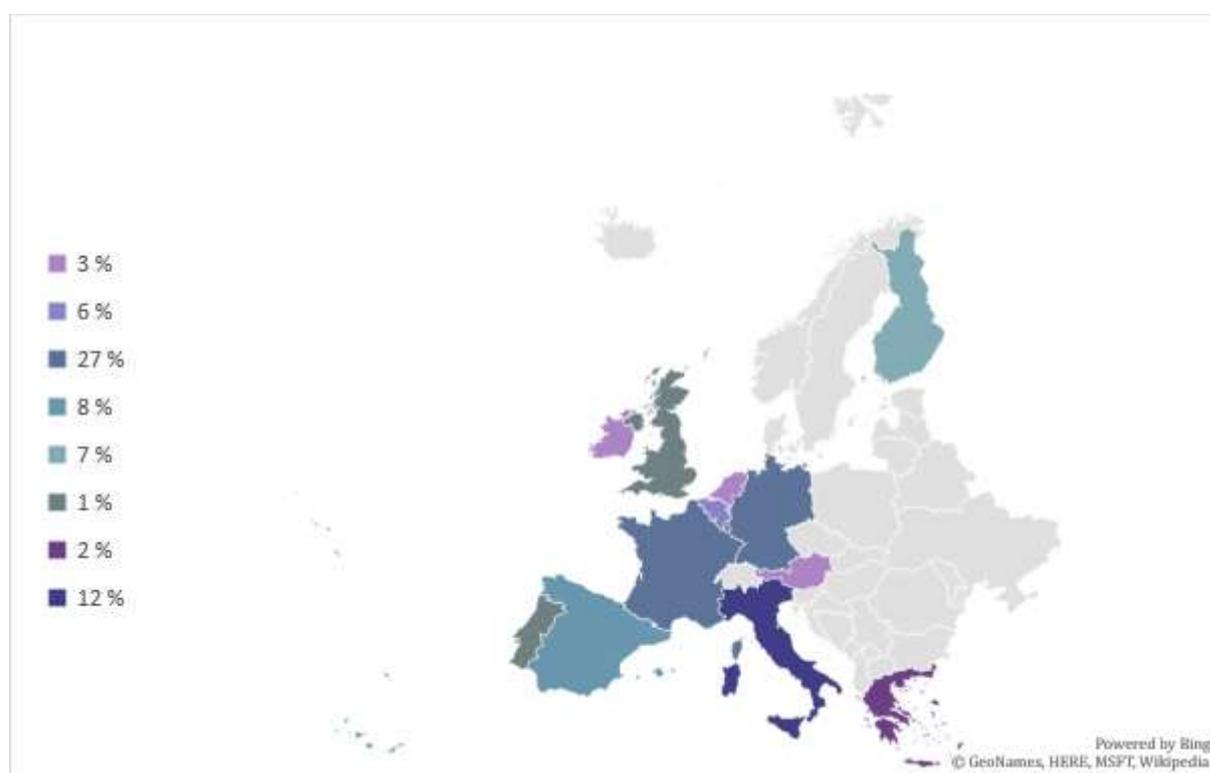


Figure 7. Country distribution of acquirer companies

3.2 Research methods and implementation of the study

3.2.1 Measuring profitability of cross-border M&A

All the statistical tests were conducted with Statgraphics 18. Statgraphics was chosen as the statistical program because of practical reasons and it was given a free trial of the program. It was also easy to use and was found to give well illustrative graphs that were useful in analyzing results. Excel was used to calculate all the needed ratios and dummy variables as well as filtering the data as relevant for the study. In addition, Excel was used in data analysis such as correlation analysis and formation of distributions and figures of industries, countries, deal types and number of completed deals by year. It was also used to calculate the average time between the date of post-M&A financial statements and the end of the review period.

As mentioned in the key terms, a company's scope of activity is generally defined by revenue, a number of employees and/or balance sheet total. Balance sheet total, as well as operating revenue, tend to grow after mergers and acquisitions because of which they are used to measure the effect of M&A on dependent variables. Choices of independent variables of the used regression model have been based on previous studies' measurement methods and applied to fit in this research.

3.2.2 Data collection

After designing a suitable way to conduct the research preparation of the empirical part of was started by finding a source of financial statement information. Zephyr M&A database was chosen as the main source to collect the research data of companies. Data collection was started by determining the search strategy. Four main things were determined in order to get the material that would meet the criteria for answering the research question. Firstly, the European Union was determined as the area of mergers and acquisitions which were chosen as the deal types. Majority of the acquisitions were done in a way that acquirer company got the controlling position in accordance with the Finnish Accounting Act (1997, 1:5). Secondly, it was determined that the acquirer company should be listed assuming that thus there would be more information available in public.

Thirdly, the time period was selected to be between the dates 31.12.2012 and 31.12.2017 assuming that most companies' fiscal years end in the last day of the calendar year. In the five-year period, the average time between the date of the first available post-M&A financial statements and the end of the review period (31.12.2017) was found to be approximately 2 years. This was considered to be sufficient time for analyzing the effects of mergers on companies' profitability since M&As are generally done expecting short-term changes. At the same time, the deal status of data was selected as completed and confirmed. The final limitation was done by selecting chemicals, rubber, plastics & non-metallic products, construction, gas, water & electricity, and metals & metal products as major sectors of acquirer companies using the classification of major sectors of Zephyr. Despite the filtering, some other major sectors were included in the initial data, of which only the aforementioned ones were included in the final study.

After determining the limitations for industries and timeframe, pre-deal and post-deal financial information about the acquirers was added. In order to calculate the dummy variable for each deal, the country codes for both acquirer and target was included in the data as well. As a result, the database provided for each transaction the name of an acquirer and a target, deal type and share of the target purchased as well as applied accounting principles and currencies of the acquirer for both pre and post-deal period. Most importantly, all the key figures needed representing the financial position of the companies were obtained. In the following step, the financial ratios for dependent variables of the regression analyses were calculated based on the obtained post-M&A key figures. After calculating margins of EBITDA, EBIT and profit after tax, ROA dummy variables, capital intensity ratios, and growth rates were calculated.

3.2.3 Reliability, validity and assumptions of the research method

Before conducting statistical tests, it was determined that both dependent and independent variables are continuous and the relationship between y and x is expected to be linear so that the Ordinary Least Square regression model can be used. In order to avoid the selection bias, random sampling of observations was conducted. Based on the major sectors of companies it was selected only the capital intensive industries to the sample. In addition, sample countries share the same currency as well as accounting principles. By doing the aforementioned

limitations it was ensured that the data is essentially valid due to the internal consistency of information. (Ketokivi 2015, 2.5.3, 2.6).

Table 1. Correlations

| | <i>Dummy</i> | <i>Post-deal acquirer operating revenue</i> | <i>Growth percent</i> | <i>EBITDA margin</i> | <i>EBIT margin</i> | <i>Profit after tax margin</i> | <i>Post-deal acquirer total assets</i> | <i>ROA</i> | <i>Capital intensity ratio</i> |
|---|--------------|---|-----------------------|----------------------|--------------------|--------------------------------|--|------------|--------------------------------|
| <i>Dummy</i> | 1,00 | | | | | | | | |
| <i>Post-deal acquirer operating revenue</i> | 0,13 | 1,00 | | | | | | | |
| <i>Growth percent</i> | -0,13 | -0,13 | 1,00 | | | | | | |
| <i>EBITDA margin</i> | -0,08 | -0,04 | 0,03 | 1,00 | | | | | |
| <i>EBIT margin</i> | -0,06 | -0,01 | 0,03 | 0,97 | 1,00 | | | | |
| <i>Profit after tax margin</i> | -0,07 | -0,02 | 0,01 | 0,83 | 0,88 | 1,00 | | | |
| <i>Post-deal acquirer total assets</i> | 0,05 | 0,89 | -0,11 | 0,00 | 0,00 | -0,01 | 1,00 | | |
| <i>ROA</i> | 0,09 | -0,02 | -0,09 | 0,40 | 0,47 | 0,40 | -0,08 | 1,00 | |
| <i>Capital intensity ratio</i> | -0,17 | -0,18 | 0,04 | -0,03 | -0,13 | 0,17 | -0,10 | -0,27 | 1,00 |

In order to ensure that there is no multicollinearity due to the independent variables of the model, a correlation matrix was created. As we can see in table 1 there are no significant correlations between independent variables except “Post-deal acquirer total assets” and “Post-deal acquirer operating revenue/turnover”. These two variables were, thus, tested in separate models so that multicollinearity can be avoided.

The variance and effectiveness of OLS estimator is determined by following equation:

$$\text{Var } \hat{\beta}_i^{\text{OLS}} = \frac{1}{N-p-1} \cdot \frac{\text{Var } y}{\text{Var } x_i} \cdot \frac{1-R_y^2}{1-R_{xi}^2}$$

The bigger sample size, the fewer β -parameters, the smaller is the variance of y , the bigger is the variance of x , the higher is the coefficient of determination and the lower is the rate of collinearity of x -parameters, the smaller is the variance of OLS estimator and the more effective it is. Net amounts of all estimators have their effect on the measurement accuracy. The measurement result is reliable when the random measurement error is low. (Ketokivi 2015, 2.5, 3.4.)

One of the main assumptions of OLS estimator is homoskedasticity meaning that the variance of residuals is continuous as the predicted values in groups increase or decrease. In addition, the expected value of the error is 0, it's assumed to be normally distributed and uncorrelated to the x-variables. Durbin-Watson statistic can be used to determine whether there are significant correlations between residuals based on the order in which they occur in the data. If the P-value is greater than 0,05, there is no indication of serial autocorrelation in the residuals at the 95,0% confidence level. However, the correlation between the residuals and independent variables is difficult to test in a reliable way with statistical methods. Homoskedasticity is easier to determine based on the difference between expected and observed value. (Ketokivi 2015, 3.6, 7.2; Statpoint Technologies, Inc. 2017, 209; Statgraphics 18 2019)

The ability of a regression model to explain the dependent variable is measured by R². It is the amount of y's variance that is explained statistically by x-variables. If R² is 1,00 it means that y can be calculated accurately based on the independent variables $y = f(x)$. However, when there are more β -parameters and they are more complicated R² is rarely high. Therefore, it is difficult to determine when the R² is high enough. (Ketokivi 2015, 3.5.)

After running summary statistics, tolerance limits and probability plots of dependent variables, it was clear that the data doesn't follow a normal distribution. Thus, analyzing results with data in the initial form would not be reliable. Consequently, the logarithmic transformation of all the dependent variables was done. By transforming the data risk of measurement error and thus overestimating and underestimating result was able to be avoided. (Statpoint Technologies, Inc. 2017, 209) After transforming the data there are only positive values included in the models which are why sample sizes vary depending on the profitability ratio that is used as a dependent variable.

4. Results

4.1 Interpretation of the results

Interpretation of the research results is based on the relationships between profitability ratios and independent variables determining the post-M&A situation of the sample companies. The fulfillment of OLS assumptions and the reliability of the study results have been discussed as well. After conducting regressions, the main things focused when it comes to interpreting significance were on the p-values of the results as well as the standard deviations and coefficients of determination. Significance was defined at a probability of < 0.05 in the 95% confidence level. Two different combinations of regressors were used to test whether the factors of firms' size, capital intensity ratio and the dummy variable have a statistically significant effect on companies' profitability ratios. The models consist of the following variables:

$$\text{Model 1: } \log(y) = \beta_0 + \beta_1 D + \beta_2 \text{REV} + \beta_3 \text{GP} + \beta_4 \text{CIR} + \mathcal{E}$$

$$\text{Model 2: } \log(y) = \beta_0 + \beta_1 D + \beta_2 \text{TA} + \beta_3 \text{GP} + \beta_4 \text{CIR} + \mathcal{E}$$

Where:

log(y) is the natural logarithm of y

β_0 is the constant variable

D is the dummy variable, 1 indicating cross-border deal and 0 domestic deal

REV is the post-deal operating revenue of acquirer

TA is the post-deal total assets of acquirer

GP is the growth percent of acquirer

CIR is the capital intensity ratio of acquirer

\mathcal{E} is the error term

4.1.1 Statistical results

The following tables 2-5 are the results of the first regression model and tables 6-9 represent the results of model 2. Table 11 in the discussion section is a summary of all the results. The number of observations, p-values, the coefficients of determinations (r^2), standard errors as well as Durbin-Watson statistics for these two models are presented in the summary table. The difference between the two models is that there is either operating revenue or total assets as a company size determinant variable. Both of these couldn't be used in the same model due to the issue of multicollinearity. Since there is the same number of independent variables in the multiple regression model predicting the LOG(y), the ordinary r-squared is used in analysis instead of adjusted r-squared (Statgraphics 18 2019). The results are first analyzed individually and later in the discussion section on a more comprehensive level.

Table 2. Results of the model 1 on EBITDA margin

| Dependent variable: LOG(EBITDA margin) | | <i>Standard</i> | <i>T</i> | |
|---|-----------------|-----------------|------------------|----------------|
| <i>Parameter</i> | <i>Estimate</i> | <i>Error</i> | <i>Statistic</i> | <i>P-Value</i> |
| CONSTANT | -2,240 | 0,060 | -37,631 | 0,000 |
| Dummy | 0,085 | 0,062 | 1,368 | 0,172 |
| Growth percent | -0,017 | 0,035 | -0,468 | 0,640 |
| Post-deal acquirer operating rev | 0,000 | 0,000 | -0,598 | 0,550 |
| Capital intensity ratio | 0,122 | 0,008 | 15,489 | 0,000 |

Analysis of Variance

| <i>Source</i> | <i>Sum of Squares</i> | <i>Df</i> | <i>Mean Square</i> | <i>F-Ratio</i> | <i>P-Value</i> |
|---------------|-----------------------|-----------|--------------------|----------------|----------------|
| Model | 106,984 | 4 | 26,746 | 63,540 | 0,000 |
| Residual | 204,153 | 485 | 0,421 | | |
| Total (Corr.) | 311,137 | 489 | | | |

| |
|---|
| R-squared = 34,385 percent R-squared (adjusted for d.f.) = 33,844 percent Standard Error of Est. = 0,649 Mean absolute error = 0,460 Durbin-Watson statistic = 1,912 (P=0,166) Lag 1 residual autocorrelation = 0,0434 |
|---|

P-value of model 1 on the EBITDA margin in the Analysis of Variance table 2 is less than 0,05, indicating that there is a statistically significant relationship between the dependent and the independent variables. However, it can be observed that the capital intensity ratio is the only

explanatory variable that is statistically significant on LOG(EBITDA margin) with the chosen confidence level. Thus, H_0 = cross-border M&As do not have a significant effect on EBITDA margin remains valid. Despite the fact that the probability value of the Dummy variable, Growth percent, and operating revenue are not significant the joint effect of explanatory variables makes the model statistically significant.

The R-Squared statistic of the model indicates that as fitted it explains 34,38% of the variability in LOG(EBITDA margin). The standard error of the estimate shows the standard deviation of the residuals being 0,65. Since the P-value of the Durbin-Watson (DW) statistic is greater than 0,05, there is no indication of serial autocorrelation in the residuals.

Table 3. Results of the model 1 on EBIT margin

| Dependent variable: LOG(EBIT margin) | | <i>Standard</i> | | <i>T</i> | |
|---|-----------------|-----------------|------------------|----------------|--|
| <i>Parameter</i> | <i>Estimate</i> | <i>Error</i> | <i>Statistic</i> | <i>P-Value</i> | |
| CONSTANT | -2,667 | 0,076 | -34,919 | 0,000 | |
| Dummy | 0,000 | 0,078 | 0,003 | 0,998 | |
| Growth percent | 0,101 | 0,056 | 1,801 | 0,072 | |
| Post-deal acquirer operating rev | 0,000 | 0,000 | -0,658 | 0,511 | |
| Capital intensity ratio | 0,120 | 0,010 | 12,248 | 0,000 | |

Analysis of Variance

| <i>Source</i> | <i>Sum of Squares</i> | <i>Df</i> | <i>Mean Square</i> | <i>F-Ratio</i> | <i>P-Value</i> |
|---------------|-----------------------|-----------|--------------------|----------------|----------------|
| Model | 109,342 | 4 | 27,336 | 45,040 | 0,000 |
| Residual | 268,238 | 442 | 0,607 | | |
| Total (Corr.) | 377,580 | 446 | | | |

| |
|---|
| R-squared = 28,959 percent R-squared (adjusted for d.f.) = 28,316 percent Standard Error of Est. = 0,779 Mean absolute error = 0,517 Durbin-Watson statistic = 2,003 (P=0,513) Lag 1 residual autocorrelation = -0,002 |
|---|

P-value of the model in the Analysis of Variance table 3 is less than 0,05, indicating that there is a statistically significant relationship between the operating margin and the independent variables. However, the capital intensity ratio is again the only explanatory variable that's statistically significant on LOG(EBIT margin) with the chosen confidence level. Thus, H_0 = cross-border M&As do not have a significant effect on EBIT margin remains valid.

Regardless of the probability value of the Dummy variable, growth percent and operating revenue are not significant the joint effect of explanatory variables makes the model statistically significant. The R-Squared statistic of the model indicates that as fitted it explains 28,96% of the variability in LOG(EBIT margin). The standard error of the estimate shows the standard deviation of the residuals being 0,78. The P-value of the DW statistic is greater than 0,05. Thus, there is no indication of serial autocorrelation in the residuals.

Table 4. Results of the model 1 on Profit after tax margin

| Dependent variable: LOG(Profit after tax margin) | | <i>Standard</i> | <i>T</i> | |
|---|-----------------|-----------------|------------------|----------------|
| <i>Parameter</i> | <i>Estimate</i> | <i>Error</i> | <i>Statistic</i> | <i>P-Value</i> |
| CONSTANT | -3,010 | 0,088 | -34,359 | 0,000 |
| Dummy | 0,013 | 0,093 | 0,144 | 0,886 |
| Growth percent | 0,118 | 0,065 | 1,825 | 0,069 |
| Post-deal acquirer operating rev | 0,000 | 0,000 | -3,443 | 0,001 |
| Capital intensity ratio | 0,094 | 0,008 | 11,331 | 0,000 |

Analysis of Variance

| <i>Source</i> | <i>Sum of Squares</i> | <i>Df</i> | <i>Mean Square</i> | <i>F-Ratio</i> | <i>P-Value</i> |
|---------------|-----------------------|-----------|--------------------|----------------|----------------|
| Model | 139,759 | 4 | 34,940 | 42,720 | 0,000 |
| Residual | 345,957 | 423 | 0,818 | | |
| Total (Corr.) | 485,716 | 427 | | | |

| |
|--|
| R-squared = 28,774 percent R-squared (adjusted for d.f.) = 28,100 percent Standard Error of Est. = 0,904 Mean absolute error = 0,649 Durbin-Watson statistic = 1,953 (P=0,312) Lag 1 residual autocorrelation = 0,023 |
|--|

P-value of the model in the Analysis of Variance table 4 is less than 0,05, indicating that there is a statistically significant relationship between the Profit after tax margin and the independent variables. All the explanatory variables except the Dummy variable and Growth percent are statistically significant on LOG(Profit after tax margin) with the chosen confidence level. Thus, H_0 = cross-border M&As do not have a significant effect on Profit after tax margin remains valid.

Despite the p-values of the Dummy variable and Growth percent are insignificant individually on the dependent variable the joint effect of explanatory variables makes the model statistically significant. The R-Squared statistic of the model indicates that as fitted it explains 28,77% of

the variability in LOG(Profit after tax margin). The standard error of the estimate shows the standard deviation of the residuals being 0,90. The P-value of the DW statistic is greater than 0,05. Thus, there is no indication of serial autocorrelation in the residuals.

Table 5. Results of the model 1 on ROA

| Dependent variable LOG(ROA) | | <i>Standard</i> | <i>T</i> | |
|------------------------------------|-----------------|-----------------|------------------|----------------|
| <i>Parameter</i> | <i>Estimate</i> | <i>Error</i> | <i>Statistic</i> | <i>P-Value</i> |
| CONSTANT | -2,805 | 0,071 | -39,555 | 0,000 |
| Dummy | 0,111 | 0,073 | 1,519 | 0,130 |
| Growth percent | 0,078 | 0,052 | 1,499 | 0,135 |
| Post-deal acquirer operating rev | 0,000 | 0,000 | -1,050 | 0,294 |
| Capital intensity ratio | -0,058 | 0,009 | -6,364 | 0,000 |

Analysis of Variance

| <i>Source</i> | <i>Sum of Squares</i> | <i>Df</i> | <i>Mean Square</i> | <i>F-Ratio</i> | <i>P-Value</i> |
|---------------|-----------------------|-----------|--------------------|----------------|----------------|
| Model | 24,670 | 4 | 6,167 | 11,790 | 0,000 |
| Residual | 231,165 | 442 | 0,523 | | |
| Total (Corr.) | 255,835 | 446 | | | |

| |
|---|
| R-squared = 9,643 percent R-squared (adjusted for d.f.) = 8,825 percent Standard Error of Est. = 0,723 Mean absolute error = 0,461 Durbin-Watson statistic = 2,079 (P=0,798) Lag 1 residual autocorrelation = -0,040 |
|---|

P-value of the model in the Analysis of Variance table 5 is less than 0,05. It indicates that there is a statistically significant relationship between the Return on Assets and the independent variables. As in the first two cases, with the chosen confidence level Capital intensity ratio is the only variable that is statistically significant on LOG(ROA). Thus, H_0 = cross-border M&As do not have a significant effect on ROA remains valid. Regardless of the probability values of the insignificant variables, based on the joint effect of the regressors the model is statistically significant. The R-Squared statistic of the model indicates that as fitted it explains 9,64% of the variability in LOG(ROA). The standard error of the estimate shows the standard deviation of the residuals to be 0,72. The P-value of the DW statistic is greater than 0,05 indicating that there is no serial autocorrelation in the residuals.

Table 6. Results of the model 2 on EBITDA margin

| Dependent variable: LOG(EBITDA margin) | | <i>Standard</i> | <i>T</i> | |
|---|-----------------|-----------------|------------------|----------------|
| <i>Parameter</i> | <i>Estimate</i> | <i>Error</i> | <i>Statistic</i> | <i>P-Value</i> |
| CONSTANT | -2,277 | 0,058 | -38,986 | 0,000 |
| Dummy | 0,080 | 0,062 | 1,293 | 0,197 |
| Growth percent | -0,010 | 0,035 | -0,280 | 0,779 |
| Post-deal acquirer total assets | 0,000 | 0,000 | 1,391 | 0,165 |
| Capital intensity ratio | 0,123 | 0,008 | 15,905 | 0,000 |

Analysis of Variance

| <i>Source</i> | <i>Sum of Squares</i> | <i>Df</i> | <i>Mean Square</i> | <i>F-Ratio</i> | <i>P-Value</i> |
|---------------|-----------------------|-----------|--------------------|----------------|----------------|
| Model | 107,645 | 4 | 26,911 | 64,140 | 0,000 |
| Residual | 203,491 | 485 | 0,420 | | |
| Total (Corr.) | 311,137 | 489 | | | |

R-squared = 34,598 percent
R-squared (adjusted for d.f.) = 34,058 percent
Standard Error of Est. = 0,648
Mean absolute error = 0,457
Durbin-Watson statistic = 1,915 (P=0,175)
Lag 1 residual autocorrelation = 0,042

P-value of the model in the Analysis of Variance table 6 is less than 0,05 indicating that there is a statistically significant relationship between the EBITDA margin and the independent variables. Like with the model 1 all the regressors except the Capital intensity ratio are individually statistically insignificant on the dependent variable with the chosen confidence level. Therefore, the null hypothesis remains in this case valid as well. All in all, there is only a little difference between the results of the model 1 and the model 2 when it comes to p-values of coefficients, r-squared, standard error of the estimate and the p-value of DW statistic.

Table 7. Results of the model 2 on EBIT margin

| Dependent variable: LOG(EBIT margin) | | <i>Standard</i> | <i>T</i> | |
|---|-----------------|-----------------|------------------|----------------|
| <i>Parameter</i> | <i>Estimate</i> | <i>Error</i> | <i>Statistic</i> | <i>P-Value</i> |
| CONSTANT | -2,681 | 0,075 | -35,855 | 0,000 |
| Dummy | -0,003 | 0,078 | -0,035 | 0,972 |
| Growth percent | 0,104 | 0,056 | 1,844 | 0,066 |
| Post-deal acquirer total assets | 0,000 | 0,000 | -0,175 | 0,861 |
| Capital intensity ratio | 0,121 | 0,010 | 12,492 | 0,000 |

Analysis of Variance

| <i>Source</i> | <i>Sum of Squares</i> | <i>Df</i> | <i>Mean Square</i> | <i>F-Ratio</i> | <i>P-Value</i> |
|---------------|-----------------------|-----------|--------------------|----------------|----------------|
| Model | 109,099 | 4 | 27,275 | 44,900 | 0,000 |
| Residual | 268,481 | 442 | 0,607 | | |
| Total (Corr.) | 377,580 | 446 | | | |

R-squared = 28,894 percent
R-squared (adjusted for d.f.) = 28,251 percent
Standard Error of Est. = 0,779
Mean absolute error = 0,519
Durbin-Watson statistic = 2,003 (P=0,511)
Lag 1 residual autocorrelation = -0,002

P-value of the model in the Analysis of Variance table 7 is less than 0,05 indicating that there is a statistically significant relationship between operating margin and the explanatory variables. Like with the model 1 all the regressors except the Capital intensity ratio are individually statistically insignificant on the dependent variable with the chosen confidence level. Therefore, the null hypothesis remains in this case valid as well due to the insignificant estimate of the Dummy variable. All in all, there is only a little difference between the results of the model 1 and the model 2 when it comes to p-values of coefficients, r-squared, standard error of the estimate and the p-value of DW statistic.

Table 8. Results of the model 2 on Profit after tax margin

| Dependent variable: LOG(Profit after tax margin) | | <i>Standard</i> | <i>T</i> | |
|---|-----------------|-----------------|------------------|----------------|
| <i>Parameter</i> | <i>Estimate</i> | <i>Error</i> | <i>Statistic</i> | <i>P-Value</i> |
| CONSTANT | -3,042 | 0,087 | -35,160 | 0,000 |
| Dummy | -0,008 | 0,093 | -0,085 | 0,932 |
| Growth percent | 0,125 | 0,065 | 1,925 | 0,055 |
| Post-deal acquirer total assets | 0,000 | 0,000 | -2,815 | 0,005 |
| Capital intensity ratio | 0,096 | 0,008 | 11,695 | 0,000 |

Analysis of Variance

| <i>Source</i> | <i>Sum of Squares</i> | <i>Df</i> | <i>Mean Square</i> | <i>F-Ratio</i> | <i>P-Value</i> |
|---------------|-----------------------|-----------|--------------------|----------------|----------------|
| Model | 136,609 | 4 | 34,152 | 41,380 | 0,000 |
| Residual | 349,107 | 423 | 0,825 | | |
| Total (Corr.) | 485,716 | 427 | | | |

R-squared = 28,125 percent
R-squared (adjusted for d.f.) = 27,446 percent
Standard Error of Est. = 0,909
Mean absolute error = 0,653
Durbin-Watson statistic = 1,954 (P=0,319)
Lag 1 residual autocorrelation = 0,022

P-value of the model in the Analysis of Variance table 8 is less than 0,05 indicating that there is a statistically significant relationship between Profit after tax margin and the independent variables. Again, there are no significant differences between the results of the model 1 and the model 2 when it comes to the p-values of coefficients, coefficients of determination, standard errors of the estimates and the p-values of DW statistics. Due to the fact that the p-value of the Dummy variable's estimate isn't significant, the null hypothesis remains in this case valid as well. However, in addition to the p-value of Capital intensity ratio, p-value of the Post-deal acquirer total assets is statistically significant as well.

Table 9. Results of the model 2 on ROA

| Dependent variable: LOG(ROA) | | <i>Standard</i> | <i>T</i> | |
|-------------------------------------|-----------------|-----------------|------------------|----------------|
| <i>Parameter</i> | <i>Estimate</i> | <i>Error</i> | <i>Statistic</i> | <i>P-Value</i> |
| CONSTANT | -2,777 | 0,069 | -40,267 | 0,000 |
| Dummy | 0,105 | 0,072 | 1,450 | 0,148 |
| Growth percent | 0,071 | 0,052 | 1,361 | 0,174 |
| Post-deal acquirer total assets | 0,000 | 0,000 | -2,578 | 0,010 |
| Capital intensity ratio | -0,058 | 0,009 | -6,473 | 0,000 |

Analysis of Variance

| <i>Source</i> | <i>Sum of Squares</i> | <i>Df</i> | <i>Mean Square</i> | <i>F-Ratio</i> | <i>P-Value</i> |
|---------------|-----------------------|-----------|--------------------|----------------|----------------|
| Model | 27,525 | 4 | 6,881 | 13,320 | 0,000 |
| Residual | 228,310 | 442 | 0,517 | | |
| Total (Corr.) | 255,835 | 446 | | | |

| |
|--|
| R-squared = 10,759 percent R-squared (adjusted for d.f.) = 9,951 percent Standard Error of Est. = 0,719 Mean absolute error = 0,457 Durbin-Watson statistic = 2,083 (P=0,809) Lag 1 residual autocorrelation = -0,042 |
|--|

P-value of the model in the Analysis of Variance table 9 is less than 0,05 indicating that there is a statistically significant relationship between Return on Assets and the independent variables. Unlike in the first model, in addition to the p-value of Capital intensity ratio, p-value of the Post-deal acquirer total assets is statistically significant. In other respects, there are no significant deviations between the results of the model 1 and the model 2 when it comes to the p-values of coefficients, coefficients of determination, standard errors of the estimates and the p-values of DW statistics. Consequently, the null hypothesis remains valid due to the fact that the p-value of the Dummy variable's estimate isn't significant.

4.1.2 Review of pre-M&A and post-M&A figures

Statistical tests provide useful information about the relationship between the variables related to M&As and profitability. On the other hand, information about how the M&A deal affects the figures after completing the deal is needed as well. Calculations of the average pre-M&A and post-M&A figures and ratios are collected to the table 10. Changes in profitability ratios can be used as an additional analysis alongside statistical outcomes.

To sum up results in the table below, there are neither big changes in turnover nor total assets between pre-deal and post-deal period. However, operating revenue is declined on average as a consequence of merger or acquisition. Profit after tax margin and Return on assets have declined as well. Both EBITDA and EBIT margin show a positive development in profitability after M&A.

Table 10. Pre-deal and post-deal figures and ratios in average

| | <i>Pre-deal average</i> | <i>Post-deal average</i> |
|--------------------------------|-------------------------|--------------------------|
| <i>Operating revenue</i> | <i>13 073 290</i> | <i>12 978 137</i> |
| <i>Total assets</i> | <i>21 012 456</i> | <i>21 225 554</i> |
| <i>EBITDA margin</i> | <i>16,78 %</i> | <i>17,83 %</i> |
| <i>EBIT margin</i> | <i>7,56 %</i> | <i>8,47 %</i> |
| <i>Profit after tax margin</i> | <i>6,63 %</i> | <i>5,55 %</i> |
| <i>ROA</i> | <i>7,56 %</i> | <i>5,32 %</i> |
| <i>Capital intensity ratio</i> | <i>3,06</i> | <i>3,13</i> |

5. Discussion of the results

In the literature review, the aim was first to approach the research theme by collecting results and observations of authors that have studied mergers and acquisitions from a certain point of view. The emphasis of the studies was on the impact of M&As on profitability, efficiency, shareholder's wealth, market power or company's financial performance in general. Secondly, similar factors and findings related to the study setting of the aforementioned indicators were found out. It was also discovered if there are any significant issues that can affect study results and should be taken into account when analyzing results.

The aim of the study was to clarify in a reliable and comparable way the research problem. Therefore, some critical limitations were conducted such as geographical area, currency, reporting method, and sector of the business. Despite these limitations, there can still be a number of factors that may have an effect on the results. For instance, some companies may have a significant amount of goodwill in their balance sheet which affects the figures. The existence of goodwill naturally expands the balance sheet total and goodwill impairment lowers margins.

5.1 Do cross-border M&As affect profitability?

The objective of statistical tests was to provide an answer for the main research question of whether cross-border M&A activity has an impact on a company's profitability. In order to answer the research question and discuss the problem and phenomena from different perspectives four null hypotheses were created.

The model that was found to be reliable in determining profitability ratios in a statistically significant way is Dummy variable determining whether M&As are cross-border or domestic, the determinant of company's size which was either post-deal operating revenue or total assets, growth rate and capital intensity ratio.

Determinants of company size and capital intensity have been used in previous studies to determine the profitability of mergers and acquisitions. When it comes to growth rate, it has

been found by Davidsson et al. (2002, 334-335) that there is a negative relationship between the size of a company and growth rate. This means that as the firm size gets larger the smaller its growth rate is. In contrast, Valouch et al. (2015, 421) concluded that mergers would more likely affect positively on large companies' profitability. Earlier in this paper, it was also stated that growth in the context of M&A is closely related to profitability due to synergy benefits. Therefore, the variable was perceived as relevant to include in the regression models to test what kinds of results study setting of this paper would bring. As a result, it can be concluded that as a firm gets larger as a consequence of M&A growth rate has a significantly positive effect on Profit after tax margin and EBIT margin.

Summarizing the results of statistical tests in table 11, it can be seen that all the models were significant. However, Capital intensity ratio is the only explanatory variable whose coefficient is significant individually on all the profitability ratios. Similar findings in terms of capital intensity's significance with Bhuyan (2002, 75) was thus able to be done. However, when it comes to the effect of capital intensity on profitability, the author stated that it has a significantly negative effect on profitability. Therefore, capital intensive industries would more likely incur losses than those that are not (Bhuyan 2002, 75). On the other hand, in this research paper, it was found that the capital intensity ratio actually has a positive impact on profit and loss-based profitability ratios.

Results of regressions being statistically significant with the 95% confidence level indicates that all the models are statistically significant. However, the null hypotheses could not be rejected due to the insignificant estimate of the Dummy variable in each model. In addition, Durbin-Watson statistics of all the models are above 0,05. Therefore, the null hypothesis that there are no significant correlations between residuals remains valid. Taking both of these into account it can be stated that, regardless of the ratio as the dependent variable, mergers and acquisitions seem to have an impact on companies' profitability in the industrial sector.

Table 11. Summary of the multiple regression results

| <i>Dependent variable</i> | <i>Model</i> | <i>Number of observations</i> | <i>P-value</i> | <i>R²</i> | <i>Standard error</i> | <i>Durbin-Watson statistic</i> |
|---------------------------------|--------------|-------------------------------|----------------|----------------------|-----------------------|--------------------------------|
| 1. LOG(EBITDA margin) | 1 | 490 | 0,000 | 0,344 | 0,649 | 1,912 (P=0,166) |
| | 2 | 490 | 0,000 | 0,346 | 0,648 | 1,916 (P=0,175) |
| 2. LOG(EBIT margin) | 1 | 447 | 0,000 | 0,290 | 0,779 | 2,003 (P=0,513) |
| | 2 | 447 | 0,000 | 0,289 | 0,779 | 2,003 (P=0,511) |
| 3. LOG(Profit after tax margin) | 1 | 428 | 0,000 | 0,288 | 0,904 | 1,953 (P=0,312) |
| | 2 | 428 | 0,000 | 0,281 | 0,909 | 1,954 (P=0,319) |
| 4. LOG(ROA) | 1 | 447 | 0,000 | 0,096 | 0,723 | 2,079 (P=0,798) |
| | 2 | 447 | 0,000 | 0,108 | 0,719 | 2,083 (P=0,809) |

At the 95% confidence level, the joint effects of a dummy variable, operating revenue/total assets, growth percent as well as capital intensity ratio on all the profitability indicators are significant. However, it was discovered that not all the independent variables are individually significant on the profitability. Both models 1 and 2 that predict LOG(EBIT margin) produced p-values for coefficients of growth rates that would be statistically significant at the 90% confidence level. Their p-values are respectively 0,072 and 0,066. In the case of model 1 and 2 that predict LOG(Profit after tax margin) the probability values were respectively 0,069 and 0,055 being below 0,1 and thus significant as well as the 90% confidence level. At the 95% confidence level, the results of growth percent on the aforementioned profitability ratios would be statistically insignificant so they can be considered to be statistically almost significant.

By looking at the coefficients of determination of the models it can be noticed that there is variation across them. For instance, both models 1 and 2 predicting LOG(ROA) produced relatively low r-squares meaning that with the research data profitability ratios cannot accurately be determined based on the independent variables. This result, on the other hand, was expected initially when planning the regression models including complicated variables. On the other hand, there are models that can be said to predict profit margins to some extent. When it comes to LOG(EBITDA margin) its p-values and DW statistics are significant and R² are in both models 1 and 2 respectively 0,344 and 0,346 being highest of all the regressions.

$$1) \log(y) = \beta_0 + \beta_1 D + \beta_2 REV + \beta_3 GP + \beta_4 CIR + \mathcal{E}$$

$$2) \log(y) = \beta_0 + \beta_1 D + \beta_2 TA + \beta_3 GP + \beta_4 CIR + \mathcal{E}$$

R-squares, p-values and DW statistics of LOG(EBIT margin) and LOG(Profit after tax) are in the level where the models can be used to predict the dependent variables in a reliable way as well. Therefore, the following combination of independent variables given in 1) can be said to explain the variability of margins to some extent. Explanatory variables in the first model are constant, Dummy variable, Post-deal operating revenue of acquirer, Growth percent, and Capital intensity ratio. The same conclusion can be made in the second setting 2) where the model includes constant, Dummy variable, Post-deal total assets of acquirer, Growth percent and Capital intensity ratio.

When it comes to the analysis of cross-border M&As' effect on companies' profitability, it's more difficult. The dummy variable determines whether the completed merger or acquisition was cross-border or not. In each regression value of the coefficient of the dummy variable isn't individually significant on the dependent variable. However, in the case of multiple regression all the explanatory variables and their joint effect matters. At least, it can be stated that M&As do have an impact on profitability ratios of acquirer companies in industrial sector. 61% of the research data was cross-border mergers and acquisitions but based on the results it cannot be confirmed that cross-border merger or acquisition affect profitability differently than domestic one. With greater coefficient of determinations, profit margins can in a certain extent be reliably estimated by the independent variables of the study.

5.2 How do cross-border M&As affect profitability?

In order to answer to the sub research question, analysis of the effects of independent variables individually on each profitability ratio was done. In table 12 effects of x-variables and their significance on each profitability, the ratio is collected. In addition to the results of statistical tests, average changes between pre-M&A and post-M&A figures and ratios were calculated and illustrated in figure 8. Figure 8. illustrates the same information than the table 10 showing how both independent and dependent variables have developed on average after M&As. All the estimates whose p-values are on the 95% and 90% significant level are highlighted. That is because some of the estimates were close to reaching the 95% significance level and considered as statistically almost significant results. These results may be useful in analyzing the whole picture.

Effects represent the results in tables 2-9 showing the sign of the estimates. The effects are either positive (+) or negative (-) and they are represented for both models. P-values of the estimates are shown below the effects as well. The first sign and the first p-value apply for the estimates of the model 1 and the second sign and the second p-value apply for model 2. As stated in chapter 4 there are no big differences between the estimates of the two models when it comes to their significance.

Table 12. Effect of independent variables on profitability ratios

+ Positive relationship / - Negative relationship

Model 1/Model 2

| | Dummy variable | Post-M&A operating revenue | Post-M&A total assets | Growth rate | Capital intensity ratio |
|--------------------------------|----------------|----------------------------|-----------------------|--------------|-------------------------|
| <i>EBITDA margin</i> | +/+ | - | + | -/- | +/+ |
| <i>P-value</i> | 0,172/0,197 | 0,550 | 0,165 | 0,64/0,779 | 0,000/0,000 |
| <i>EBIT margin</i> | +/- | - | - | +/+ | +/+ |
| <i>P-value</i> | 0,998/0,972 | 0,511 | 0,861 | 0,0723/0,066 | 0,000/0,000 |
| <i>Profit after tax margin</i> | +/- | + | + | +/+ | +/+ |
| <i>P-value</i> | 0,886/0,932 | 0,001 | 0,005 | 0,069/0,055 | 0,000/0,000 |
| <i>ROA</i> | +/+ | + | - | -/+ | -/- |
| <i>P-value</i> | 0,130/0,148 | 0,135 | 0,0103 | 0,294/0,174 | 0,000/0,000 |

All in all, there are only a few differences between the models when it comes to the effects of independent variables on profitability ratios. The most obvious is to observe that the capital intensity ratio seems to affect positively on all the margins. On the hand, on ROA capital intensity ratio has a negative effect which is logical due to for example increased production machinery that expands balance sheet total. Results of statistical tests indicated that Capital intensity ratio was the only explanatory variable in the multiple regression models that had a significant effect on all the tested profitability ratios.

Based on the analysis in figure 8. firms become more capital intensive after M&A. As stated earlier in this paper, capital intensity is in other studies related to the company's ability to sustain its profitability. This is due to the large investments which are considered as an entry barrier to which competitors would have to be able to respond. Less competition, in turn, reflects

as more secure future prospects when it comes to the demand for products and services. This can be seen as improved EBITDA and EBIT margin as well as Capital intensity ratio that has slightly risen as a consequence of M&A deal.

The relationship between total assets and Profit after tax margin seems to be positive. The p-value of total asset's coefficient is also $< 0,5$ indicating that as the balance sheet total increases Profit after tax margin seems to increase as well. This may be for instance due to the appropriations that reduce the balance sheet total and are increase the taxable income in the profit and loss statement. Based on the results in the table above p-value of the post-M&A the estimate of total assets on ROA is $< 0,05$ indicating that it's individually significant to predict the value of ROA. The effect of total assets is negative on ROA meaning that as balance sheet total increases ROA decreases. That could be seen to be in line with the average change between post-M&A and pre-M&A in figure 8. The figure shows that operating revenue that has slightly declined and total assets that have, in turn, slightly increased after M&A explaining the downward trend of ROA.

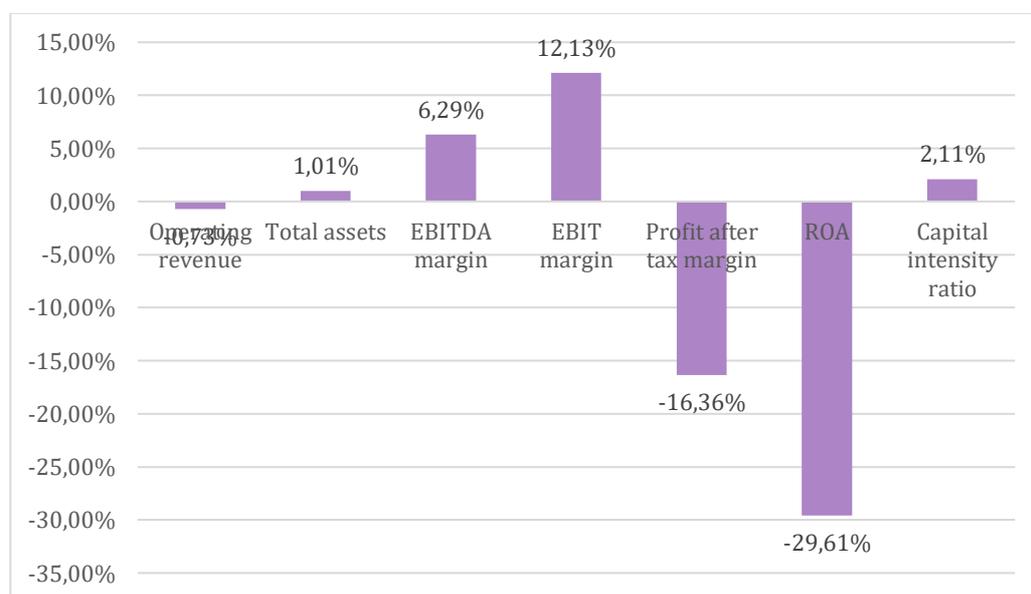


Figure 8. Average changes between pre-M&A and post-M&A figures and ratios

Profit after tax margin and ROA have declined compared to the pre-deal period. Results indicate that even though turnover hasn't risen margins before interest and tax show the opposite trend because of cost savings that have realized due to merger or acquisition. Capital intensity ratio has risen slightly as well indicating that M&A deal has possibly brought more production equipment with it. Therefore, it may be that reduced need to make investments is reflected also

as a decrease in costs. Efficiency gains are reflected in improved profitability ratios. This can be seen in the figure where EBITDA and operating margin have developed positively.

EBITDA and EBIT margins show two stages of profit and loss statement. The EBITDA margin is more comparable ratio among companies because it only takes into account the relation between costs of goods sold, personnel costs + other operating costs and total operating income. Therefore, excluding costs related to investment and financing policy EBITDA margin indicates better the relative development of operative expenses and revenue. Due to the fact that EBITDA margin has in average improved it can be stated M&A positively affect the financial position when it comes to the adequacy of revenue to cover borrowing costs, taxes as well as investments.

In the deeper level, it seems that in case of ROA, expansion of average balance sheet total being more than revenue may indicate that there's a significant amount of intangible assets, such as goodwill, that have grown total assets. It's also possible that as a consequence of M&A, intangible assets that were not at the balance sheet of the target before the acquisition, are accounted due to the requirement of IFRS 3 to separate other assets from goodwill. On the other hand, assets tend to grow altogether as a consequence of M&A and a greater amount of assets in relation to revenue can also be a consequence of a decrease in turnover as well.

Like stated in the literature review, it's more difficult to enhance revenue than obtaining efficiency gains. Therefore, managers ability to generate revenue from the firm's assets has in average impaired. When it comes to Profit after tax margin, a possible reason for the decline in the ratio can be a result of reserves that expand the equity and liabilities side of the balance sheet and increases the change of appropriations or compulsory reserves by lowering the taxable income. From the point of view of profit distribution, seems that M&As in short-term have a negative effect on firms' ability to generate profit for shareholders.

In the post-M&A period profit margins can not only be affected by increased revenue and/or reduced operating costs but also goodwill impairment. Impairment of goodwill can in accordance with IFRS be done as the benefits of the business combination accrue to the company. Consequently, the value of goodwill decreases which means it has to be impaired. Goodwill has to be impaired also when a company has found reliable evidence showing that the goodwill won't any longer demonstrate performance and the value related to acquired

assets. If the goodwill of the acquired assets is impaired it may, thus, indicate either M&A deal has been successful due to the positively generated cash flows or the expected synergies were initially overestimated and consequently written down.

Like stated in the literature review, the benefits may be accumulated due to synergy benefits or the use of intangible assets that cannot be separated from goodwill. Problematic is that goodwill is mainly based on management expectations about the potential of the target to generate earnings in the future or the expected cost savings gained by the association. Therefore, amounts of goodwill and goodwill impairments may not only play a significant role but also show in very different scales in companies' financial statements.

If the results of this research paper were concluded it could be said that post-M&A revenue seems to have a statistically significant effect on profitability. This can be stated since the p-value of the operating revenue's coefficient in table 4 on Profit after tax margin is below 0,05. In the same regression, it can be noticed that the growth rate is almost significant with the p-value $< 1,00$. Results in table 3 indicate that with the p-value of less than 1,00 growth almost significantly affects Operating margin. In figure 8, it can be observed that the EBIT margin has developed positively after M&A. Thus, it's possible that as a company grows as a consequence of cross-border M&A its operating margin improves.

By looking at figure 8, it shows that post-M&A revenue has on average declined. The same change can be seen with Profit after tax margin. Therefore, it could be stated that with the setting of this study mergers and acquisitions seem to decrease significantly Profit after tax margin due to contraction of activity. Contrary to operating revenue total assets have on average expanded a little. This is logical due to the fact that in acquisition assets and liabilities of the target company are transferred to the acquiring firm. Majority of the sample companies acquired the whole share base of the target company which has an effect on the results.

When analyzing the results of the empirical study, the fact that they describe the research problem in a narrow setting must be taken into account. The results are affected by the limitations of time frame, industries, and geographic area. In addition, there were several other things determining the search strategy when collecting the data initially. Analysis of the research results can thus only be generalized within the framework of the research. Despite the

narrow setting, the study can be repeated for instance with a different period of time which makes it reliable.

6. Conclusions

Globalization and companies' need to maintain their position and competitiveness in the market could be seen as the main motives for international M&As. What's problematic, though, is that many studies have provided evidence that mergers and acquisitions can affect both positively and negatively on companies' performance. According to one survey, sensibly made pre-M&A screening can increase the probability of gaining positive effects from the deal by 28%. Conversely, it could mean that if the probability of mergers and acquisition to be successful were 50%, even if the screening were done properly there is still 36% probability of failure. Therefore, studying the effects of M&As and especially those that cross national borders, is important.

According to Thomson Reuters Deals Intelligence statistics, cross-border mergers exploded into growth worldwide in 2014. Both the quantity and the value of deals were the biggest for seven years. The increase can be seen as companies' willingness to take advantage of increased demand for goods and services that the economic growth brought. This phenomenon can also be seen in the number of completed deals of the sample companies being the highest in 2015.

The effect of M&As can be realized in a number of ways but what corporate management generally pursue through M&A deals is growth. The growth of a business is in many ways important for every company regardless of the industry. In some industries, however, resource availability is the key when it comes to a competitive position. Because of common and developed market international corporate financing and cross-border mergers and acquisitions have begun popular. Cross-border mergers and acquisitions have represented an increasing amount of M&As since the beginning of the millennium. Statistics of Thomson Reuters confirm the fact that cross-border deals have begun as the phenomenon of the 2010s. This is one of the reasons why multinational business transactions are worth taking as the subject for scientific research.

Positive consequences of M&As comes from synergistic benefits which are believed to be attained. Synergy can in practice mean increased value of a company, improved cost structure or revenue enhancement. M&A transactions can be used for achieving short-term growth in an inorganic way. They can also be strategic solutions for a company that wants to attract new

customers by expanding its activity to a new industry or market area. In addition, by acquiring a competitor M&A deal will lead to a greater market share affecting the dynamics of the market as well as the performance of the company.

Mergers and acquisitions are typically used as a strategy to expand the business. Growing business organically would require either enhancing revenue by increasing the volume of sales and to conduct it large investments might be needed. Through M&As companies don't directly generate more revenue but expand the business by merging or acquiring fully or part of other business. In this way, companies have new kind of strategical opportunities in their hands. However, growth does not guarantee improved profitability for merged or acquired firms.

Even if the market situation were favorable it doesn't mean that there are no risks related to a merger. Many authors have brought up the fact that one of the risks of merger lies in integrating two companies successfully. The same issue applies when it comes to acquisitions where an acquirer gets the authority over the target company. In this case, the acquirer has decision-making power over the real processes of the target firm. Challenges may arise when two companies from completely different industries are united. The risk that could be related especially to international mergers is when different cultures come across. In order to achieve synergistic benefits through revenue growth, successful implementation of the strategy, smooth communication and cooperation are key factors. These issues explain the fact that it's more difficult to generate revenue in an inorganic way than obtain cost benefits.

In addition to previous studies, history has proved that the consequences of M&As can be positive or negative. M&A deal may not be a success if the synergy benefits are overestimated. This can happen if the customer base changes significantly and sales don't meet the expectations. It's more difficult to realize synergistic benefits by enhancing revenue because of the challenges of marketing and customer base-related issues. It's also possible that there comes a new entrant in the market which changes the market dynamics and threats to attract the customers. Issue such as differences between two firm cultures and especially in terms of cross-border mergers and acquisitions country-specific behavior differences are also things that may create risks.

Cases, when mergers and acquisitions have proved to be not as profitable than initially planned, can be recognized with a significant amount of goodwill impairments after acquisitions.

However, the interpretation of goodwill impairment isn't that unambiguous since it may also indicate the amount of generated cash flows that reduce the value of goodwill. In this paper, it wasn't possible to study the effect of goodwill or goodwill impairment on the profitability due to the fact that in the financial statement data balance sheet items were not specified. It would have been interesting to study the effect of goodwill and its impairments on profitability, though.

It has been claimed that the effects of M&As for welfare are difficult to estimate empirically due to the fact that they don't necessarily affect similarly on market power and productivity effects. Efficiency gains are said to be obtained by reallocation of production within the firm. When it comes to market power company may want to create entry barriers to prevent excess competition in order to sustain the profitability of its business. On the other hand, companies in the industrial sector may want to have joint ownership with other countries' businesses for the sake of relationships. Crossing national boundaries an acquiring firm can have access to international markets and improve the availability of resources.

It has been stated in this thesis that the industrial sector is one of the factors determining the growth of a firm. Why growth is interesting for this research is that it has an influence on a company's profitability. There are several factors that have been studied by other authors and found to mutually create the growth rate of a firm. The model created by Davidsson et al. (2002, 337-338) that define growth includes not only industrial sector but also for instance firm's age, business and overall enterprise size, legal form, ownership governance, international activities, and location. Some of these variables are used in this research paper as well. Like stated in the very beginning, the variables of the regression model are quite complicated and so are the factors of growth.

One of the interests of this paper was to find out what kind of factors significantly have an impact on the merged company's profitability. The problem was approached by discovering the findings of authors that have previously studied mergers and acquisitions and other research-related themes. In the study by Davidsson et al. (2002) that is presented in this paper it is argued the fact that firm size materially affects the growth rate of a firm. In the same study, it's stated that the growth rates of small companies are higher than their bigger counterparts. However, as known that growth is not the only factor that counts in profitability, another study was taken into the closer examination. The other study by Valouch et al. (2015) concentrated on the

profitability and returns gained by merger based on the size of a firm. The research provided some evidence on the fact that the bigger the company is the more positive effects merger seems to have.

In this research, it was studied whether factors determining firm size, have a significant effect on profitability ratios. Unlike Valouch et al. (2015) it was not studied different sized firms but the change in the size of the companies compared to the pre-M&A period. Due to the difference between the study settings it was not able to end up with the same kind of results than Valouch et al. (2015). However, based on the analysis of average pre-M&A and post-M&A figures, similar findings than Davidsson et al. (2002) were able to do. When it comes to the effect of firm size to company's growth, it was found that the operating revenue of the sample companies was in average lower than in the pre-M&A period. As a consequence of merger or acquisition number of personnel as well as total assets tend to increase and thus the assumption of growth of firm size can be done.

The empirical research process started by investigation of existing research of the theme. At first, previous results of the studies about M&As' effect on profitability, in general, were familiarized with. Later articles and studies about cross-border M&As, vertical integration and efficiency gains in the industrial sector were found as well. Consequently, the theme was limited to the cross-border M&As and industrial sectors in order to avoid the study being too broad. The chosen timeframe was 5 years and the average time after conducted merger or acquisition was about 2 years. For the sake of comparability, the data needed to be consistent. Therefore, only countries belonging to the euro area and using IFRS standards were included in the study.

Different kind of analyses was done based on the collected data in order to understand it. It was stated that the majority of the companies in the research had been done in the cross-border context and the majority of the companies acquired all of the target company's outstanding shares. When it comes to the geographical distribution of the sample from the 13 countries, over half of the acquirer companies were from France and Germany. Possible reason explaining these countries to represent such a big number of the sample would not only be their size but also a better economic situation compared to, for instance, Spain.

To sum up briefly the outcomes of statistical, all the models showed statistically significant relationships between the independent variables and profitability ratios. As a conclusion, it can

be stated that based on the joint effects of the Dummy variable, Post-M&A operating revenue/ Post-M&A total assets, Growth rate, and Capital intensity ratio, mergers and acquisitions do affect profitability. However, it was discovered that not all the independent variables including the Dummy variable, are individually significant on the profitability. The dummy variable, that determined whether the completed M&A was cross-border or not, wasn't individually significant on any of the dependent variables. Thus, the research showed that cross-border mergers and acquisitions do not have an impact on the profitability of companies in the industrial sector. On the other hand, in the case of multiple regression the joint effect of independent variables matters and it can be confirmed that M&As, in general, seems to have an impact on industrial companies profitability.

The function of the dummy variable in the regression model was to define the international context of M&A. Variable defining international activity in the study of Davidsson et al. (2002, 342-343) was a change in the labor market area during the observation period. Based on their results, international activity had a significantly positive effect on the growth rate of sample firms. (Davidsson et al. 2002, 342-343.) The multiple regression results of this research paper did not provide evidence on the fact that cross-border M&As would affect differently on the performance of the companies than domestic ones.

The sub research question was: "How do M&As affect profitability?". The answer to this was made based on the signs of the coefficients of explanatory variables. In addition, an analysis of companies' pre-M&A and post-M&A performance on average was done. This proved to be helpful for seeing the overall picture. In the statistical tests, it was found out that Capital intensity ratio and Growth rate in model 1 had a significantly positive effect on Profit after tax margin which seems logical. On the other hand, Total assets had a significantly negative effect on Profit after tax margin. This indicates that as balance sheet total increases Profit after tax margin decreases. It's difficult to define exact explanations for the negative relationship but it may be due to tax-related smoothing strategies or reserves that expand the equity and liabilities side of the balance sheet and increases cost side of the profit and loss statement.

Total assets had a significantly negative effect on Return on Assets as well. That's easier to explain since the amount of assets increases in relation to the revenue. In addition to the natural growth of assets as a consequence of M&A, there can be other explanations for their growth as well. Under the requirement of IFRS 3 to separate other IAs from goodwill, it may happen that

they are accounted for more easily for the balance sheet of the target before the acquisition. Like total assets, Capital intensity ratio had a similar kind of effect on ROA in terms of both model 1 and 2. The reason would be the same than in the case of Total Assets. For all the margins Capital intensity ratio had, in turn, the opposite effect. Despite the effect of capital intensity on profitability, in terms of its significance, similar findings with Bhuyan (2002) was done. A possible explanation for a positive relationship would be the fact that as acquirer obtains some or all the assets of the target company, it reduces the need for doing investments and decreases costs. Things that may improve cost efficiency as well are rationalization of headquarter services and reallocation of production within the firm.

In addition to the statistical test, average pre-M&A and post-M&A performance were compared. It was found out that Profit after tax margin and ROA had a downward trend in the post-M&A period. Results indicated that operating revenue was actually lower in contrast to the pre-M&A period. However, there was an increase in EBIT and EBITDA margins compared to the time before merger/acquisition. This would indicate cost savings that have realized due to M&A have been on average more significant than revenue growth.

Capital intensity ratio was risen slightly as well being in line with the results of statistical tests. Capital intensity ratio is related to the entry barrier and it could also be seen to reduce the need to make investments due to achieved resources. This, in turn, reflects a decrease in costs and improved profitability in terms of EBIT and EBITDA margin. Statistical results confirmed that as balance sheet total and capital intensity increases Return on Assets decreases. This seems quite logical because in average balance sheet total had been grown more than revenue. The growth of total assets can be considered as normal as assets tend to grow altogether after M&A due to goodwill and other intangible assets.

All in all, the conclusions of this paper are that cross-border mergers and acquisitions can, in short-term, have both positive and negative effects when it comes to the profitability of companies performing in the industrial sector. The effect depends on the profitability ratio and interpretation related to it. Seems that M&As increase capital intensity of companies which, in turn, improves their competitive position by creating entry barriers. In addition to market position, this paper proved that the financial condition of the firm improves when it comes to their ability to meet the costs of borrowing, investments as well as a tax payment. However, from the point of view of owners and investors, M&As don't necessarily serve their interest in

short-term due to the impaired ability to distribute profits. It was also found that managers' ability to generate profit from the assets of companies seems to weaken as the size of a firm gets greater.

The research results can be seen to bring new perspectives and added value to the research of M&As and accounting. Both the literature review as well as empirical results may be useful for the corporate management planning on cross-border merger or acquisition. Target groups that could find the results interesting as well are investors and other stockholders. Possible further research could be done for instance with the same study setting with a different time period. The perspective of the research could be a little different as well, such as financial position, and different set of control variables can be used.

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