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DO MERGERS AND ACQUISITIONS CREATE VALUE? EVIDENCE FROM THE FINNISH CONSTRUCTION INDUSTRY

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ABSTRACT:

This thesis examines the impact of mergers and acquisitions on the firm value of the acquirer in the Finnish construction industry. In this study, firm value is measured by the price development of the publicly traded stock of the acquirer. The sample data includes events occurring during 2001 to 2019 and is limited to Finnish publicly listed and traded construction companies. Stock market data consists of individual stock price data collected from the Helsinki Stock Exchange and M&A data collected from ThomsonReuters. According to previous research in this field of mergers and acquisitions, it is found that most transactions tend to destroy firm value in contrary to their preliminary purpose. Previous research has mainly focused on the construction industries of the United Kingdom and United States. There has been little research in value creation of mergers and acquisitions in the Finnish construction industry or other industries.

The empirical part of the research is conducted by using the event study methodology which is an appropriate method for examining the effects of mergers and acquisitions. The value effect of the event is measured by the abnormal returns and cumulative abnormal returns of the acquirer's stock. The chosen benchmark is the OMX Helsinki index. The chosen event windows for the examination are [-20, 20], [-10, 10], [-5, 5] and [-1, 1]. Furthermore, a t-test is conducted to test the statistical significance of the empirical results. The first hypothesis of this thesis proposes that mergers and acquisitions have a negative impact on the firm value of the acquirer in the Finnish construction industry. The second hypothesis suggests that vertical mergers create more value for the acquirer measured by abnormal returns than horizontal mergers do.

The study examines the first hypothesis by examining the cumulative abnormal returns at the end of each event window. Transactions are considered successful in case they generate positive cumulative abnormal returns at the end of each event window. The results suggest that in short-term mergers and acquisitions in the Finnish construction industry tend to generate negative or extremely moderate positive cumulative abnormal returns and vertical M&A's do generate not only superior but also positive cumulative abnormal returns in comparison to horizontal transactions, however the t-tests show statistical insignificance.

1. INTRODUCTION

The amount of mergers and acquisitions in general as well as in the construction industry have been increasing during the recent years. Only in 2017, there were a hundred thousand global mergers with a total value of approximately 4,7 billion dollars. In the engineering and construction industry there were 3506 deals with a total value of over 251 million dollars globally. The construction industry environment has been favorable for new mergers and acquisitions as there has been increasing demand for both domestic and cross-country market opportunities as well as existing demands in aging infrastructure. (Bureau van Dijk 2017.)

These kinds of mergers and acquisitions have occurred mostly in cyclical periods, companies either taking advantage of periods with lower asset prices to invest in mergers and acquisitions or during times with higher prices. The first kind of behavior in carrying out corporate mergers and acquisitions is known as anticyclical behavior, the latter being procyclical behavior. Previous studies show that M&A behavior is most often considered to be procyclical, indicating the common notion that most of mergers and acquisitions fail to succeed. Merger and acquisition related procyclical decision-making is done during upturn cycles in the economy, often not taking into consideration the following value-decreasing downturn. (Eisenbarth & Meckl 2014.) This economic cyclity and capability of future-looking development among other factors impacts the success of a merger or acquisition which this study will also contribute to by investigating whether mergers and acquisitions create value for the acquiring company in the Finnish construction industry.

1.1. Purpose of this study

The purpose of this study is to provide an understanding on theories of mergers and acquisitions and eventually examine whether mergers and acquisitions create or destroy value of the acquiring company and secondly, whether vertical mergers and acquisitions tend to succeed better in creating acquirer value than horizontal M&A's. The value creation in this study is considered as an increase in the stock price of an a publicly listed acquiring company compared to a benchmark stock market index. In other words, the

abnormal increase or decrease on the company's stock price returns indicates the success or failure of a merger or acquisition. The study concentrates in the stock price development during a short-term period and the changes in the stock price will be measured before, during and after the transaction using chosen event windows. This study has been limited to recent mergers and acquisitions in the Finnish construction industry between years 2001-2019.

This kind of limitation has been done to provide a research on an industry combined with a limitation of a geographical area where mergers and acquisitions and their value creation for the acquirer has not been researched. Transactions in the construction industry in general have been researched very little. The merger waves of recent decades in the Nordic construction industry have worked as a stimulus for this study.

1.2. Hypotheses

The hypotheses of this study are based on earlier studies on whether mergers and acquisitions create value for the acquirer measured by changes in stock price and they follow the empirical results of Savor & Lu (2009), Kedia, Ravid & Pons (2011), Moeller and Schlingemann & Stulz (2005). These previous studies related to M&A success and value creation find that there are negative abnormal returns for the acquirer post-merger. Thus, the first hypothesis of this paper is:

H_1: Mergers and acquisitions have a negative impact on firm value of the acquirer in the Finnish construction industry.

Secondly, previous studies have shown support on the differing success of vertical and horizontal mergers. Thus, Raudszus et al. (2014) works as the motivation for the second hypothesis of this study which is:

H_2: Vertical mergers create more value for the acquirer through abnormal returns than horizontal mergers do.

1.3. Structure of the thesis

The study is structured in a logical order with first introducing mergers and acquisitions in the introduction. After the introduction, a theory section will follow with the main concepts of mergers and acquisitions and the key theories in increasing or decreasing corporate stock value. A description of the merger and acquisition process will follow which will include the examination of key factors in M&A success or failure. After that, a literature review of previous research in transactions in general and in the construction industry as well as the differentiating performance of vertical and horizontal M&A's is introduced. Value creation will follow with a description on the data and methodology used in this study. Lastly, the empirical results of the research will be presented with the final summary and conclusions.

2. MERGERS AND ACQUISITIONS

The primary purpose of a merger or acquisition is to combine two businesses to achieve synergy. This maintains sustainability, competitiveness and growth for the business. Mergers and acquisitions are a part of a firm's business strategy, an option for corporate expansion and vital growth. A successful merger or acquisition consists of a long process which includes careful strategical management of both pre- and post-transaction related factors. (Weber 1996.)

Mergers and acquisitions can be classified into three groups depending on the basis of the merger type: vertical, horizontal and conglomerate. When two companies at different stages of production merge, it is called a vertical merger. Vertical mergers provide the acquirer the ownership over the target firm but also control of the whole chain of production. (Kedia, Ravid & Pons 2011.) According to Fan & Goyal (2006) vertical merger activity does not only concentrate on specific industries but over time they have appeared in different industries such as oil and gas during the fourth merger wave and transportation equipment industry later in the 1990s. Horizontal mergers appear between firms operating in the same industry. Contrary to a vertical merger, horizontal mergers increase industry concentration and decreases competition. (Pavlou 2015.) A conglomerate merger differs from the two earlier types of mergers. When two firms operating in different lines of business merge, they form a conglomerate merger. The acquisition between Google and Motorola works as an example of a conglomerate merger. (Chiu, Chung & Yang 2016.)

Although there is no particular constant pattern for a takeover, the process of a merger or an acquisition can be divided into two phases, the pre- and post-takeover phases. Specific success factors can be placed into these two stages of the process but other phases of the process can not be standardized as every acquisition and its characteristics are different. (Gomes 2013.)

Mergers and acquisitions act as an opportunity to grow and develop also in the construction industry. Transactions in the construction industry grew rapidly in the 1990s during

the time of new technological innovations and economic globalization. Despite the radical increase of mergers and acquisitions in the construction industry, little research has been done in this area. Most previous research studies concentrate on businesses in the United Kingdom and the United States. Previous research has shown that mergers and acquisitions in the construction industry have at least to some extent outperformed transactions in other non-construction industries in the United States. (Choi & Russell 2004; Choi & Harmatuck 2006.)

2.1. History of mergers and acquisitions

The past of mergers and acquisitions have shown that the field has a short memory and the characteristics of unsuccessful M&A's tend to be forgotten as they are often repeated in later mergers and acquisitions. In this particular field, history shows a significant meaning in recognizing the features of potentially failing deals and forecasting failure in time. The history of mergers and acquisitions can be sorted into merger waves, also known as periods of high activity in deals. These merger waves go back to the 1890s when the first wave took place. The 20th century has been the era of remarkable merger activity and four merger waves have been noticed during this time starting from 1904, 1916, 1965 and 1984. A sixth short but intense merger wave is said to have taken place from 2003 to 2007. (Gaughan 2012.)

The first wave took place after the depression of 1883 in the US, having a peak in the turn of the century. It mainly targeted the industrial sector such as primary metals, machinery, bituminous coal and transportation equipment as the turn of the century was a period of high development in technology and industrial innovations. (Martynova & Renneboog 2008.) According to Stigler (1950), the main reasons for mergers during the first merger wave were related to creating monopoly positions. The first merger wave ended in 1904 when antitrust laws were set to prevent excessive formation of monopolies in the economy. This period has also been referred to as the Great Merger Wave as the mergers carried out during this period formed large multinational corporations which have had extremely long-run impacts both in the US economy and across borders.

The second merger wave started in 1916 after the more small-scale M&A activity during First World War and began bringing more than one operator in the industries that had previously had a monopoly. Through mergers smaller companies aimed for growth and economy of scale to compete with the leading firm in the industry. During this time, industries such as automobiles and agricultural tools were affected by high merger activity. The equity market crashed in 1929 with the great depression following the years after which was also the end for the second merger wave. (Stigler 1950.)

As a consequence of the depression, the merger activity retained at a modest level for almost half a century. In the early 1950s the US set more strict antitrust laws which began the trend of merging for diversification of products and services. Mergers were done to expand businesses over the borders of their primary business which created value and decreased the volatility of their earnings. (Martynova & Renneboog 2008.) During the first two mergers, investment bankers financed most of the mergers until the 1960s. As demand for higher credit during the third merger wave, credit markets tightened and interest rates increased. As the oil crisis broke out in 1973, the economy suffered a recession and thus, ended the third merger wave. (Gaughan 2012.)

The fourth wave took place from 1984 to 1989. The stock market had rose from the economic recession and merger activity began to increase. The main feature of the fourth merger wave are the hostile mergers which occurred remarkably more often than in the previous takeover waves. (Gaughan 2012.) Mergers are often referred to as hostile or friendly which reflects the public attitude of the merger target towards the offer made by the acquirer. Hostility refers to a negative attitude towards the offer that is then rejected by the target. When the target approves the takeover, it is considered friendly. (Schwert 2000.) During the fourth wave especially in the US the size of the deals increased radically and the largest companies in the country were targets of mergers and acquisitions. The wave of the megamergers affected especially industries such as oil and gas. In the late 1980s the long economic expansion ended and the junk bond market collapsed which lead to the end of the fourth merger wave. (Gaughan 2012.)

As the economic globalization rose, technological innovations sparked and financial markets boomed in the end of the 20th century, the fifth merger wave occurred. Compared to the four earlier merger waves, the fifth wave had a wider reach. Takeovers emerged in Asia and there were nearly as many mergers and acquisitions in Europe during the 1990s as in the US. As a result, cross-border mergers formed a notable proportion of takeovers. (Martynova & Renneboog 2008.)

The sixth merger wave was fueled by low interest rates after the recession ended in the beginning of the 21st century. The private equity industry benefitted from the rising market and companies could be bought with attractive prices and later on sold at a profit. As the industry thrived, the need for takeover targets increased. The sixth wave was relatively short compared to the earlier merger waves but intense measured by deals volume. As the subprime crisis occurred in 2007, the low interest debt was cut off and merger activity dropped as investors lost interest. (Gaughan 2012).

The mergers and acquisitions activity in the Nordic countries increased significantly during the fifth merger wave in the end of the 20th century. After the turn of the millennium, the size of the Nordic mergers and acquisitions market covered approximately 15 percent of all domestic and 22 percent of all cross-border transactions in Europe. Most of the mergers and acquisitions in the Nordics were cross-border transactions during the beginning of the 21st century. The Nordic countries sparked large M&A target interest in the United Kingdom as the countries had a similar corporate governance legislation and institutional financial environment and they showed strongly positive cumulative average abnormal returns for the acquirer. In addition, Scandinavian M&A bidders have shown positive announcement effects compared to the European Union enlargement. (Martynova & Renneboog 2006.)

2.2. Theories of mergers and acquisitions

This chapter introduces the common theories of mergers and acquisitions and hypotheses that drives the research of M&A value creation. The motives behind carrying out a merger or an acquisition do not rely on one single theory but various theories. These motives

depending on how the planning of the strategy pre-M&A and the integration phase post-M&A are carried out may lead to increase or decrease in firm value and synergies.

2.2.1. Efficiency theory

The efficiency theory refers to a merger or acquisition as a planned action to achieve synergies. Synergies can be classified to financial, operational and managerial synergies. According to the efficiency theory, financial synergies through M&A's offer the firm a possibility to lower its cost of capital either by decreasing its systematic risk by expanding the investment portfolio to businesses unrelated to the core focus of the firm or broadening the firm's size and thus receiving capital with a lower cost. A third way for a firm to achieve financial synergies is to allocate its capital more efficiently by affiliating with an internal capital market. (Trautwein 1990.) An internal capital market enables a firm's headquarters to allocate the capital efficiently to the divisions within the corporation with highest returns. (Stein 1997.) However, there has been argument whether an efficient internal capital market can exist. Montgomery & Singh (1984) show that there is in fact no evidence for a lower systematic risk than the market portfolio.

Operational synergies can be achieved by bringing together two or more previously separate business units or transferring knowledge between these. (Trautwein 1990.) Managerial synergies are achieved when the managers of a merger or acquisition succeeds to create superior performance and returns by concentrating and managing on a specific project or deciding to pursue or drop one. (Jensen & Murphy 1988.) Operational and managerial synergies have been a target of criticism as they often are referred to as a motive for mergers and acquisition but are rarely possible to be realized. (Kitching 1967.)

There has been research aiming to prove the efficiency theory in stock markets and event studies such as mergers and acquisitions. The stock market generally values mergers and acquisitions positively, however this does not eventually show in firms' actual performance. The theory holds whether one trusts the stock market to be efficient and values it more reliable than the firms' financial statements. Otherwise, the efficiency theory must be rejected. (Trautwein 1990.)

2.2.2. Synergy theory

The synergy theory proposes that the value of two businesses combined is greater than their sum when functioning separately. In his study, Kitching (1967) concentrated on the ease of achieving synergies through mergers and acquisitions and the dollar value of these synergies. Managers of the sample transactions remain quite skeptical about synergies and do not give value for them when evaluating a merger or acquisition and its value creation. The largest potential for synergies are among production related mergers where long production lines can be made more efficient and thus, the purchase of more costly machinery can be justified. In addition, quantity discounts are given as the purchasing power and economies of scale increase. Due to the possibility to share R&D and knowledge, technology is another highly potential area for synergy benefits through mergers and acquisitions. M&A synergies in the marketing area enable a firm to sell two different products through one distribution line and takeovers in the organization area in turn eliminate duplicate functions. However, Kitching (1967) finds that the greatest synergy release and largest ease of achievement is derived from financial mergers compared to any other type of merger.

Leland (2007) examines the magnitude and existence of purely financial synergies in mergers and acquisitions and the financial benefits difference between a merger situation and two separate firms. The scope of the financial synergy is dependent on factors such as tax rates, the relative size and the riskiness of cash flows. If the risk levels or default costs differ radically between the two parties of a merger, the financial synergies can be negative. In his study, Leland (2007) does not rely on Modigliani-Miller's (1958) theory of a world without taxes and bankruptcy because in that case there would be no purely financial synergies. As capital structure has a significance, taxes and bankruptcy costs are taken into consideration and operational cash flows are non-synergistic. He finds that financial synergies achieved from mergers or acquisitions have a higher possibility to be positive in situations where correlations and volatilities are low.

2.2.3. Hubris hypothesis

A common motive for takeovers according to Roll (1986) is the managerial hubris. The hubris theory is often used to explain excessive managerial overconfidence in mergers and acquisitions since the sole motive for merging or acquiring are the manager's personal motives, not the synergies for the acquiring firm. Roll (1986) suggests that managers of the acquiring companies overvalue potential merger targets because they estimate the synergies to be higher than they eventually are. As a result of incorrect valuation and excessive confidence, the bidding firm tend to overpay for takeover gains if they even exist at all. In mergers and acquisitions, the CEO hubris is often also referred to as the winner's curse. The winner's curse refers to a bidding situation of a target firm where a range of bids is placed. The average of the bids set equals the underlying value of the firm. However, the winning bid is always higher than the average which leads to the winner overpaying. (Varaiya 1988.)

A study by Brown & Sarma (2007) show that CEO overconfidence and dominance are a key factor in explaining the decision for a takeover. The results show that the CEO dominance has at least as equal significance for the transaction as the CEO hubris and finds support on Heaton's (2002) proposition of an independent board of directors being an effective way to diminish CEO hubris. Malmendier & Tate (2005) test the hubris hypothesis of CEO's on corporate investment decisions and similarly find that there is a positive correlation between the managerial sensitivity of investing and overconfidence. Overconfidence has a stronger impact in equity dependent firms. The study suggests that in order to mitigate the CEO hubris, some discipline regarding CEO incentives should be placed.

2.2.4. Empire-building theory

The empire-building theory claims that the planning and execution of mergers and acquisitions are done by managers who aim to maximize their own benefits instead of the stockholders. (Trautwein 1990.) The background behind this theory is introduced in the study by Berle & Means (1933) on the relationship between the ownership over companies and corporate control. Later studies have taken the study by Berle & Means (1933) further and formed theories and models based on this background study. Mueller (1969)

studies the interdependence of corporate growth maximization in mergers and managers' future expectations of future earnings compared to stockholders'.

Among the theories of mergers and acquisitions, the empire-building theory has been the most honored. This is due to the vast range of theories that the larger concept of empire-building theory covers with each of these theories having its own limitations. In addition, the empire-building theory hasn't been a target of large research which results to little evidence so far and increasing interest in further research. (Trautwein 1990.)

2.2.5. Size theory

Gorton, Kahl & Rosen (2009) suppose that companies do not merge with other companies that are larger than themselves. For this reason there is most often a less amount of interested acquirers for the considerably larger target companies. The reason for the phenomenon of the size theory is due to transactions with larger target companies involved often requiring more assets and effort from the acquiring firm. These kind of large mergers and acquisitions also have a higher risk of financial loss in the case of possible failure or withdrawal of the deal. In addition, in larger transactions there might be for example requirements for preliminary payments or other resources in the deal terms even before the transaction itself. (Eisenbarth & Meckl 2014.)

2.3. Measuring value creation and success in mergers and acquisitions

In the case of a merger or acquisition where the acquirer is a publicly listed and traded firm, it is important to understand the determinant of success or failure in a transaction. Success of the merger and acquisition for the acquirer can be measured by the value created through the transaction. The key element in measuring and determining this achieved value is the stock price of the acquiring public company. The price of the company's share is a reflection of the investor's future view of the company's ability to offer growth and earnings. (Mellen & Evans 2018.)

There are also two other methodologies to examine the successfulness of a merger or acquisition. The first methodology is based on a rating method which gives manager's the opportunity to evaluate the merger or acquisition success through questionnaires. (Rozen-Bakher 2017). However, this method can include bias due to subjective opinions of the participants (Huber & Power 1985) and difficulties to compare pre- and post-M&A success or failure as positions tend to change as the transaction is carried out. (Weber, Shenkar & Raveh 1996).

The third methodology is based on information received on accounting principles and financial statements from the company. This data is used to build a view on the development of the company's financials during pre- and post-M&A periods. In this method, it is believed that the value created by the transaction will reflect in the key figures of the financial statements of the firms such as market share, sales, cash flows and solvency. (Changjun & Qiaoyue 2014).

According to Das & Kapil (2012) the main assumption behind event studies, such as mergers and acquisitions, is that the markets are efficient and stock market participants react to the announcement of a deal immediately. This reaction causes fluctuation in the price of the company's stock and thus is a reflection of the investor's view on whether the transaction generates value for the acquiring firm in future after the deal. Short-term value impacts of mergers and acquisitions can be well measured by short-term stock price development. However, if the transaction objectives are more strategic and the success of a deal is determined more from the viewpoint of for example the level of success in post-merger integration, investigating only short-term stock prices does not reflect the success or failure of the deal. In this study, however, we are specifically interested in the short-term stock price value creation before, during and after an announcement of a deal.

3. MERGER AND ACQUISITION FACTORS

3.1. Pre-transaction success factors

The strategy formulation of the merger or acquisition is the first step in the process. The motives for the takeover are often based on the previous theories on mergers and acquisitions and they form the main objectives and strategies of the transaction. (El Zuhairy, Taher & Shafei 2015.) This chapter will concentrate on describing the factors impacting the first half of the acquisition process, the pre-acquisition phase.

3.1.1. Evaluation of the partner

The first step after recognizing the need for an acquisition is the evaluation of the strategic partner which consists of multiple factors. This process of careful evaluation of financials, tax matters, asset valuation, operations, and company valuation is also known as the due diligence process of the acquisition target. It is a comprehensive analysis of the strengths and weaknesses of the target firm with estimates on the company's financial stability, cash flows, competitiveness and ability to meet its strategic targets. (Kissin & Herrera 1990.) The due diligence process is neutral, however in the case of cross-border mergers there can be disagreement on the role of due diligence. Due diligence provides not only the acquirer but also the advisors and lenders confidence on the acquisition and the risks associated with it. The due diligence process can consists of evaluation of the target firm's industry, history, development, products and services, management, accounting policies, information systems and financial performance. As due diligence has a critical role in the merger and acquisition process and it often affects every aspect of the business, it is a large expense for the acquiring company. (Angwin 2001.)

3.1.2. Size

Earlier research finds that the level of similarity in the size of the buy- and sell side firm has effects on the merger or acquisition outcome. In mergers and acquisitions, this kind of difference in the size can be referred to as "size mismatch." Kitching (1967) studied

the reasons for miscarrying mergers in the 1960's and found that there is a size mismatch in 84 percent of the sample mergers. A mismatch was defined as the acquired company having less than 2 percent of the acquiring company's sales volume. In situations with large size mismatches the management has to pay special attention to the integration of the acquired company and use the right kind of organizational structure and reporting between parties. Often during the integration the organization structure is altered towards a more consolidated model which in worst case means confusion on reporting relationships both in the acquiring and the target firm.

3.1.3. Pre-transaction communication

Communication between the buy and sell side during the whole merger or acquisition process has a crucial role. Bastien (1987) finds that the three central issues regarding the pre-transaction communication are pervasive personal uncertainty, coping with this uncertainty and sudden switches and culture shocks. Personal uncertainty associated with the transaction is not only an issue of the executives and managers but is spread on all levels of the organization. Uncertainty is described to be mostly a loss of certainty in corporate control, power and influence but also in some cases in the income security. The highest level of uncertainty can be noticed on the early phases of the integration of a merger or acquisition.

Concerns among the acquired firm and its employees can turn into expectations of the fusion and how it affects immediately themselves and eventually also their work group. Issues can be related to short-term employment but also long-term behavioral and cultural factors. Factors affecting how these concerns are dealt with depends on superiority of the employee and the level of integration done by the acquirer. Managing the employees of the acquired firm and their expectations during the whole merger process plays a vital role. This can be done by ensuring high quality and consistency of communication, trust in the management, credibility of leadership, believable information and fairness in the actions. (Hubbard & Purcell 2001.)

3.1.4. Valuation and price of the transaction

According to Goold, Campbell & Alexander (1994) the most common way of destroying firm value through a merger or an acquisition is to simply pay too much. Thus, the key factor in the pre-transaction stage is finding the correct price for the takeover. While it is critical that the valuation of the target company is done correctly, previous literature also show that the form of payment affects the outcome of the takeover. Bower (2001) and Howell (1970) suggest that friendly deals using stock as a payment for the acquisition perform better than the ones using cash.

Eccles, Lanes & Wilson (1999) propose that the key of merger and acquisition valuation is knowing the highest price you are willing to pay and keep the discipline to stick to this price. The study concentrated on investigating how one should know the amount to pay for an acquisition and the logic behind the decision-making. This was done by interviewing 75 senior executives from 40 companies with a long history of experience and skills from acquisitions. Although highly skilled with expertise, some senior executives showed excessive attachment and emotion towards a takeover. The results showed that the key for senior executives and board members to a right acquisition with the right price was a combination of analytical punctuality and discipline during the whole process.

3.1.5. Overall strategy and M&A experience

Previous research shows that earlier experience in mergers and acquisitions more often results in a more successful transaction in comparison to acquirers that lack the experience. Continuous and accumulated experience that has resulted in successful transactions can be integrated to a new merger or acquisition with some changes depending on the characteristics, nature and timing of each individual case. Previous experience offer the potential of learning and possibly succeeding in a takeover, however, they often do fail due to the realization of this potential. The quality of the experience outweighs the quantity of the experience. The learning process is referred to as an acquisition where superior takeover performance is generated. (Hayward 2002.) Contrary to Hayward (2002), Jemison & Sitkin (1987) recall that learning through previous M&A experience only

matters when these transaction are done in a more intense pace which limits the amount of firms that can actually learn from previous M&A's rather small. Collins, Holcomb, Certo, Hitt & Lester (2009) take the research further and separate the previous M&A experience of a firm to cross-border and domestic transactions. Previous experience in mergers and acquisitions in a specific country advances the acquirer to choose the same country for subsequent M&A's in the future. Learning through previous processes is not only limited to a different environment but also experience in the selection of the target firm, negotiation of the deal and integration phase.

3.1.6. Courtship period

Courtship period in mergers and acquisitions refers to a time period before the actual takeover. In addition to previous acquisition experience, an acquiring firm can have knowledge from previous relationships with the target firm and this can be developed during the courtship period. The purpose of this period is to help the two parties of the transaction to have a broader knowledge of each other by enabling access to inside information and thus, preventing any challenges further in the integration phase. A courtship can emerge in the form of a joint venture, a specific project partner, a trading partner or a board-interlock. (Colombo, Conca, Buongiorno & Gnan 2007.)

3.1.7. Future compensation policy

A future compensation for managers and CEOs on the acquiring side can work as an incentive for better success in the management of the takeover. Grinstein & Hribar (2004) find that superiors who have more influence on the decisions of the board receive higher bonuses but there is a positive relationship only between bonus compensation and effort, not bonus compensation and deal performance. From the sample of 327 large mergers and acquisitions during 1993 to 1999, 39% of the acquirers reward the CEO's with bonuses tied to the success of a transaction. More effort given by the CEO and a larger size of the deal increases the amount of the bonus. However, the deal size is positively correlated with managerial power as CEO's with more authority in the firm are more likely to get involved with larger deals. These finding are supported by Bebchuk, Fried & Walker

(2002) and Bebchuk & Fried (2003) in the studies of the relationship of managerial power and executive compensation. Managers and CEO's can use their power to impact the compensation arrangements which are often paid in the form of cash bonuses. CEO's and managers of mergers and acquisitions are aiming to maximize rent extraction and attempt to justify the compensation by the additional time and effort spent on the deals.

3.2. Post-transaction success factors

Research confirms that the integration and implementation part of a merger or acquisition has a large effect on whether a transaction can be considered a success or a failure. These factors affecting the level of success of a deal after it is carried out are also known as the post-M&A factors. Thus, at least as much attention should be paid on the integration and implementation post-M&A as on the factors in the pre-transaction stage. (El Zuhairy, Taher & Shafei 2015.)

3.2.1. Integration

A merger and acquisition process involves the post-M&A integration stage. It has been referred to as the most critical stage of a takeover as it realizes the potential of a merger or acquisition when successfully done. Before evaluating whether a strategy has succeeded in creating value for the acquirer, it is important to not only take into consideration how it has been implemented but also the outcomes of the strategy. (El Zuhairy et al. 2015.) These findings are supported by Lubatkin (1987), Chatterjee (1986) and Singh & Montgomery (1987) with some limitations.

In addition to the integration itself, the speed of the integration has an important role in the success of a takeover. Bauer, King & Matzler (2016) separate the integration in two categories, human and task integration. They find that the speed of both human and task integration have a significant impact on the performance of the transaction. The speed of task integration is negatively correlated with the performance while human integration has a positive correlation. Bauer et al. (2016) also find the relationship of cultural fit and the speed of integration as a factor of M&A performance. Cultural fit has a positive

relation with the task integration speed meaning that a better cultural fit decreases the negative effects of the faster task integration. These findings support the previous research on cultural fit and shareholder value creation by Chatterjee, Lubatkin, Schweiger & Weber (1992). A similar separation of human and task integration is done by Birkinshaw, Bresman & Håkanson (2000.)

3.2.2. Leadership

An important factor in the process management of the merger or acquisition strategy after the takeover is leadership. Finding a suitable leader for the deal can be considered the single most important factor in carrying out the takeover. A study by Anslinger & Copeland (1996) finds that ensuring the right leader for carrying out a deal can be found in three ways. The current executives of the firm can be evaluated, non-leader managers within the firm can be considered or specialists outside the firm can be hired. From a sample of acquirers, nearly 85% kept the same managers in their roles also post-acquisition. Other successful acquirers found their managers elsewhere inside the company. There is found to be a slight difference between financial buyers and strategic corporate acquirers in their policy of replacing managers after the targets of the merger or acquisition are not met. Financial buyers tend to replace managers in leadership roles in average three times quicker than corporate ones. This is believed to be due to unwillingness of corporations to replace managers as they can have large effects on the firm's culture.

As mentioned earlier, the reasons for a failed merger or acquisition can be the sum of many factors. However, previous research has showed in increasingly that the main factors are human-related. (Mirvis 1985; Kavanagh & Ashkanasy 2006.) The empirical results of Covin, Kolenko, Sightler & Tudor (1997) show that the style of deal leadership has an effect on the transaction outcome and thus, should be taken into careful consideration when planning a takeover. This is highlighted as a crucial part of the planning due to Schweiger & Denisi (1991) showing that in time these leadership issues tend to get worse, not forgotten.

3.2.3. Integration team and alternatives for M&A's

The process of mergers and acquisitions are often time-consuming and tend to draw away attention from other daily business functions and internal growth of the firm. Ghemawat & Ghadar (2000) suggest that even though takeovers are considered a must for corporate growth and market power, many companies end up concentrating on internal innovations and development instead of mergers or acquisitions. This is seen as an alternative way to compete with industry competitors and modify the markets. Other alternatives for M&A's are for example building corporate scale by forming relationships and alliances in the industry or instead of acquiring a business rather being the seller side of a deal. For firms seeking extremely risky cross-border M&A's it might be a more safe option to consider domestic takeovers.

Larsson & Finkelstein (1999) propose that the post-M&A organizational integration phase and its success is the most crucial single factor on realizing synergies. Synergies can only be realized properly if the organization post-transaction is managed well. Inkpen, Sundaram & Rockwood (2000) find that issues in the organizational integration can lead to employee dissatisfaction and defection. These issues are said to be destructive especially in companies that function in service-based industries. A separate coordination team for the post-M&A phase should be assigned to prevent this.

3.2.4. Communication during implementation

Communication during the post-M&A integration is critical for the implementation process. Successful communication requires coordination between managers and employees of the acquiring firm as well as between them and the acquired firm. Communication should be started already in the very early stages of the takeover. All stakeholders should be taken as a part of the merger or acquisition process, not solely given relevant information during the process. (Budwar, Varma & Katou 2009.) A study by Weber, Rachman-Moore & Tarba (2012) finds that communication during implementation is positively correlated with M&A performance. However, these findings vary between countries and the amount of need for communication during the M&A process can also differ

among cultures. Although Budwar et al. (2009) name communication as a critical part of M&A performance, some studies find that it can also have a contrary effect if done too intensively. Overcommunication destroys the needed flexibility of managers and makes it harder to react to unexpected situations.

3.2.5. Realization of synergies

According to Sirower (1997) synergies in mergers and acquisitions can be explained as the increase in performance of the combined firm over what the two are already expected or required to accomplish as independent firms. Previous research has showed that synergies are an important motive for M&A's but they often tend to be overestimated and not achieved. The synergy realization is often described as the measure of the economic success of the merger of acquisition. A value of synergy lower than expected signals an unsuccessful deal and failure of integration. (Gates & Very 2003.)

Haspeslagh & Jemison (1987) propose four sources of synergy benefits: resource sharing, functional skill transfer, financial transfer and strategic logic. Resource sharing can eliminate overlaps and enhance effectiveness when resources are redirected in better use. Intangible resources such as a brand or intellectual property can also be shared. Functional skills refer to special know-how of the acquired firm for example related to technology or manufacturing innovations. Financial transfer benefits can be assets that the acquired firm provides for the acquirer to enable more lucrative growth of revenues. The last source, strategic logic refers to the new management of the target company.

Harrison, Hitt, Hoskisson & Ireland (1991) have studied the relationship of synergies and post-acquisition performance. A common hypothesis in previous literature proposes that some form of relatedness of the acquirer and the target has a positive correlation on the value created from the acquisition. However, the study by Harrison et al. (1991) finds that related acquisitions do not necessarily create superior returns in comparison to unrelated acquisitions. In fact it shows that differences in the resource allocation between the target and acquirer may create synergy for unrelated firms. These findings are supported by Lubatkin (1987) who discovered that conversely to what he had hypothesized, horizontal

acquisitions did not create superior returns compared to vertical acquisitions. Jemison & Sitkin (1986) also noted that strategic fit alone does not guarantee superior synergies. This superior performance can only emerge if the synergies are realized effectively in the post-M&A integration phase.

3.2.6. Cultural fit

One major factor in the history of unsuccessful M&A's has been the differences in the cultural fit between the acquirer and target. During the recent year, the cultural fit has gained even more importance than the strategic fit in explaining the failure of mergers and acquisitions. The meaning of cultural fit is emphasized in cross-border mergers and acquisitions where the cultural differences are not only limited to firms but entirely different nations. (Dauber 2012.) Some research done in this field of study confirm that the cultural factors have an impact on the outcomes of the transaction and the corporate environment. Larsson & Finkelstein (1999) show a negative correlation between the employee resistance and the synergy realization. The higher the resistance was, the less synergies the transaction generated. In addition, high differences in the management style of the two businesses resulted in high employee resistance. A study by Weber (1996) on a large sample of M&As found that the cultural differences between the acquired firm and the acquirer were negatively correlated with the effectiveness of the integration process even though the deals might have been financially successful. Similar results have been found by Datta (1991) and Chatterjee et al. (1992) on shareholder value.

Although the majority of studies find that the cultural differences more often destruct the success of the integration, some studies find the opposite. Morosini, Shane & Singh (1998) argue whether cultural differences result in unsuccessful mergers and acquisitions. The study shows that firms seek for M&A targets in countries that share a similar culture in order to succeed in the transaction. However, the results show that if a firm merges with a target company that is located in a culturally distant country, they in fact perform well relative to the mergers and acquisitions done in culturally close countries.

4. PREVIOUS LITERATURE

The impact of mergers and acquisitions on the value of buy-side firms in the construction industry has been researched previously in the United Kingdom by Delaney & Wamuziri (2004) and in the United States by Choi & Harmatuck (2006), Choi & Russell (2004) and Savor & Lu (2009) among others. Raudszus, Schiereck & Trillig (2014) have studied the impacts of vertical diversification on firm value in the construction industry internationally. In general, value creation through mergers and acquisitions have been researched across industries by Alexandridis, Antypas & Travlos (2017) and Alexandridis, Fuller, Terhaar & Travlos (2013) among others.

Savor & Lu (2009) have studied whether mergers create value for acquirers. The study concentrates on finding support on the hypothesis that overvalued firms create long- term value by using their equity as currency. They use a sample of mergers that have failed for exogenous reasons between years 1978 and 2003. The study shows that US acquisitions generate negative returns for the acquirer and acquirers tend to continue performing poorly even after merger failure. For the unsuccessful stock-bidders the study shows that negative returns are even higher and thus, they have come to the conclusion that mergers are most beneficial for the long-term shareholders.

A study by Kedia, Ravid & Pons (2011) examines the market reaction to vertical mergers. According to Fan & Goyal (2006) vertical mergers provide the acquiring firm ownership and control over different stages of production of the target firm. Kedia et al. (2011) show in their results that there exists a trend of declining merger returns over the 1990s and abnormal returns for these vertical merger announcements are positive until the late 1990s. After that the returns turn negative and significant to acquirers. These findings are supported also by previous studies by Moeller, Schlingemann & Stulz (2005).

Delaney and Wamuziri (2004) have studied the impacts of mergers and acquisitions on shareholder wealth and firm's stock performance in the construction industry in the United Kingdom. Their study finds that there exists positive abnormal return for the shareholders of the buy-side firm and the target firm. In their event study they use the

standard market model and the mean adjusted return model to calculate the abnormal returns. Abnormal returns are estimated over an observation period of -20 to 20 days around each merger announcement. The results of the study show that in the construction industry in the UK mergers generate significant positive returns for the target firm but for the buy-side firm they generate only small value in a longer observation window.

The study by Choi & Russell (2004) examines the economic gains on mergers and acquisitions in the construction industry in the U.S. by testing to hypotheses. First, share- holders of construction firms can not realize significant economic gains in mergers and acquisitions. Second, the benefit to shareholders of related diversification oriented construction firms is higher than that of unrelated diversification oriented construction firms. The study found that the performance of construction mergers were positive at an insignificant level measured by equity market returns. The findings also showed that no significant performance difference was observed between two diversification strategies.

Post-merger performance of the acquiring firms has been also researched by Choi & Harmatuck (2006) in the U.S. construction industry during 1980-2002. The study completes the earlier study by Choi & Russell (2004) and the purpose of it was to test three hypotheses regarding actual operating performance after the merger: the change in synergistic gains measured by cash flow returns, the hypotheses of management welfare versus shareholder wealth maximization and the consistency between short-term-based stock market return and long-term-based operating performance. The results showed that the synergistic gains did not improve significantly after a merger and size of firms significantly increased after the integration among operating performance. The findings supported the efficient market hypothesis as long-term operating performance were consistent with the findings of stock market returns on mergers by Choi & Russell (2004).

Raudszus et al. (2014) have studied vertical diversification of mergers and whether it creates superior value in the construction industry. The study is based on the findings that vertical mergers and acquisitions create positive abnormal returns for the acquirer and in addition, it examines the idiosyncratic risk in stock returns. The study finds that vertical mergers have a larger wealth effect compared to horizontal mergers. However, Raudszus

et al. also find that risk behavior has a significant impact on wealth in the con- struction industry mergers and acquisitions and it should not be neglected as it has been done in earlier research such as Choi & Russell (2004) and Rottke, Schiereck & Pauser (2011).

In contrary to Raudszus et al. (2014), Rozen-Bakher (2017) finds that horizontal mergers and acquisition have a larger wealth impact on the company in the construction industry than vertical transactions. In his study, Rozen-Bakher (2017) has investigated the differ- ence in M&A success both horizontal, vertical and conglomerate mergers and acquisi- tions. The examination has been done between two sectors: the industry sector and the services sector. The target of interest in this thesis, the construction industry, is considered as part of the industry sector in Rozen-Bakher's (2017) study. The results show that hor- izontal mergers and acquisitions are most beneficial in the integration process of industry sector companies whereas vertical M&A's create value for service sector firms. For con- glomerate deals, implementing synergies creates success in both sectors.

Previous studies have shown that different deal characteristics have differing impacts on the success of the M&A. Epstein (2005) shows that the six keys to merger success are strategic vision and fit, deal structure, due diligence, pre-merger planning, post-merger integration and external factors. The study claims that previous studies of success and failure in M&As have been analyzed in narrow terms and uninformative measures such as short-term stock price movements and suggests that these six merger factors should be taken into consideration when evaluating merger success.

External factors can concern for example economic cycles. These are studied in Eisen- barth & Meckl (2014) as mentioned earlier in the introduction. Eisenbarth & Meckl (2014) divide the M&A decision-making of companies to anticyclical and procyclical behavior, indicating the period of either high or low asset prices when investing in trans- actions. The study finds with a sample of 78 mergers and acquisitions that behavior in transactions is most often procyclical, meaning that transaction activity increases as the benchmark for stock market price level increases. A substantial amount of attention is given to merger waves and their development. A common merger and acquisition wave is typically divided into four stages; a low turning phase, an upturn, a high phase and a

downturn. During times with increasing positive future expectations, positive cashflows, growing economy and expansion companies tend to invest in mergers and acquisitions. Whether the M&A strategy does not take into consideration the following high point and eventually the downturn stage, the decision-making is often biased with a strong paradox of company value being increased through the transaction although the following down-turn will in fact be value-decreasing.

5. DATA & METHODOLOGY

5.1. Data description

The data consists of recent M&A data from transactions occurring during the time period between January 2001 to January 2019. Table 1 represents the data criteria for the mergers and acquisitions. The time period is chosen due to the first merger or acquisition of the sample data occurring in January 2001 and the last in January 2019. Following restrictions for the data were applied. Only mergers and acquisitions with the deal status known were taken into the sample data. The parties of the merger or acquisition were also required to be in the construction industry and geographically located in Finland. This does not take into account construction industry subsidiaries operating in Finland with the parent company located in another company such as other Nordic countries for example. This limitation to the data has been chosen due to the observation that favorable economic circumstances have enabled construction companies in Finland to invest in expansion through numerous mergers and acquisitions. There has also been little research in this industry during the previous year, especially on European and Nordic countries level.

Table 1. Criteria for the mergers and acquisitions data.

M&A data criteria
1. Deal announcement during time period of 2001 to 2019.
2. Deal status is completed.
3. The acquiring firm is in the construction industry.
4. The acquiring firm is publicly listed and traded in Helsinki Stock Exchange.
5. Over 50% of shares acquired in the transaction.
6. The deal is either a merger or an acquisition.

The M&A data shows that the sample data consists of 59 events during 2001 to 2019 of which 13 are mergers and 46 acquisitions. A few mergers and acquisitions from 2000 concerned acquiring firms that are no longer listed in the Helsinki stock exchange or

operating and these companies were thus left out of the sample. 56 of the total of 59 mergers and acquisitions in the sample data have acquired 100 percent of the target firm. However, all transactions have achieved at least 50 percent of the target firm as it a requirement for majority ownership.

Since the profitability of a merger will be measured by abnormal returns of the acquiring firm's stock price following the merger, the acquiring side data consists of only publicly traded and listed companies. This limitation has been done not only because listed stocks are the interest of the study but also due to difficulties in finding quantitative data on acquired firms that often are private. As the successfulness of a merger or acquisition is measured explicitly by the stock price development of the company before, during and after the transaction, it is required that the acquirer is publicly listed. In addition, effects on the acquired company are not a target of interest due to the acquired company most often moving its businesses to the acquiring company and thus, ending its own individual operations.

Lastly, the share of ownership is required to be over 50 percent after the transaction which indicates majority ownership acquired through the merger or acquisition and the deal status must be completed. 56 out of 59 mergers and acquisitions in the sample leads to ownership of 100 percent of the shares in the acquired company after the transaction. In the rest four transactions, the acquirer holds 50-99% of the shares in the target company after the transaction. The M&A data was collected from ThomsonReuters.

To examine how the merger or acquisition affects the stock price development of the acquiring company, the data used for the investigation includes also stock price data of the publicly listed acquiring firms during the period between January 2001 and January 2019. Stock price returns are compared to the chosen benchmark index, OMX Helsinki index. OMX Helsinki is the common index of Helsinki Stock Exchange which follows the price development of all stocks listed in the stock exchange.

To investigate the empirical results of the second hypothesis, we divide the sample of mergers and acquisitions into horizontal and vertical transactions. In the sample data, the

target companies have been divided into different groups based on their mid-industry. The mid-industry of the horizontal mergers and acquisitions is building and construction and the industries of the vertical M&A's are electronics, metals and mining, software, power, alternative energy sources, machinery, professional services, transportation and infrastructure, oil and gas, automobiles, advertising and marketing and other industrials.

5.2. Event study methodology

As this research is based on certain events' impacts on firm value, the research will be carried out by using event study methodology. Fama, Fisher, Jensen & Roll (1969) introduced the event study methodology when studying the adjustment of stock prices on new information implicit in a stock split. The study found support to the conclusion that the markets are efficient, meaning that they reflect all available information and react rapidly to new information.

Event study methodology is also covered in the study by MacKinlay (1997). According to this study, an event study measures the impact of a specific event such as mergers and acquisitions, earnings announcements and issues of new debt on the value of a firm. This impact is measured by using financial market data of security prices observed over a certain period. The study of event studies in economics and finance (MacKinlay 1997) is based on the assumption of efficient markets and the market-oriented way of evaluating the success of a mergers is the measure of cumulative abnormal returns in the period following the merger.

Efficient markets have three forms depending on the strength of the impact they have on stock prices: weak, semi-strong and strong market efficiency. In weak market efficiency, prices do not follow a pattern and thus, large profits can not be made by examining the past prices of securities. Semi-strong market efficiency refers to a situation where security prices react immediately to announcements and new information. In addition to past price information on securities, the prices reflect also current information. According to the third form, strong market efficiency, security prices not only reflect past and current public information but also current private information. Inside information is considered as a

part of the security price and one can not hold any information that can lead to superior profits. Thus, in the strong market efficiency form all possible information is believed to be reflected in the security prices. (Brealey, Myers & Allen 2011: 317-318).

The event study methodology begins by defining the event of interest, which in this case is a merger or an acquisition. The next step is to define the time period where security price movements are an interest regarding this event, the event window. This means not only choosing the exact time of event but also periods surrounding it. When using stock price data, it is important to include at least one day before and after the event to capture the effects of announcements announced after the stock market closes the same day. After defining the event window, one should define the restrictions for the firm of the event study. These may be restrictions regarding the industry of the firm or internal firm characteristics. The fourth step is to calculate the estimated returns of the firm from which abnormal returns can be calculated (MacKinlay 1997).

The chosen event windows for the investigation of the abnormal returns are [-1, 1] [-5, 5], [-10, 10] and [-20, 20] days before and after the announcement of the merger or acquisition. The day zero indicates the day of the announcement of the transaction. The particular event window is chosen to investigate the different short-term development of the stock price and abnormal returns.

5.3. Calculation models

First, the percentage rate of returns of the different acquiring companies' stocks are calculated for each trading day during the period of January 2001 to January 2019. This is measured by using the following equation 1:

$$R_{i,t} = \frac{V_t - V_{t-1}}{V_{t-1}}, \qquad (1)$$

where R represents the rate of return for an individual stock or benchmark index i at time t, V_t is the value of the stock or index at time t which here indicates the closing price of day t and V_{t-1} is the closing value of the stock or index at time t-1 (MacKinlay 1997).

We calculate the same daily percentage rate of return of the benchmark index, OMX Helsinki (OMXH) for the time period of 2001 to 2009. $R_{mkt,t}$ is the rate of return of the OMX Helsinki index at time t.

Using the percentage rate of returns of the individual stocks and benchmark index, we are then able to calculate the abnormal returns (AR) between the same individual stocks and the benchmark index. Abnormal returns are the difference between the individual stocks and the benchmark index and thus the excess return generated from investing in the particular security. Abnormal return for a stock is calculated using the following equation 2:

$$AR_{i,t} = R_{i,t} - R_{mkt,t} ,\tag{2}$$

where $AR_{i,t}$ is the abnormal return for stock i at time t, $R_{i,t}$ is the rate of return for stock i at time t and $R_{mkt,t}$ is the rate of return for the market index mkt, OMX Helsinki in this study at time t (MacKinlay 1997).

Next, we calculate the average abnormal returns using the returns calculated in equation 2 to obtain the average abnormal returns of multiple different events in the sample.

$$\overline{AR}_t = \frac{1}{N}\sum_{i=1}^{N} AR_{i,\tau} ,\tag{3}$$

where $\overline{AR}_t$ is the average abnormal return of the sample events, N is the amount of events in the sample data and AR is the abnormal returns. (MacKinlay 1997.)

After calculating the abnormal returns of each trading day for each merger or acquisition, we calculate the cumulative abnormal returns (CAR) by aggregating the abnormal returns to conclude the continuum of these returns during the whole event window which in this study is either [-20, 20], [-10, 10], [-5, 5] or [-1, 1]. For this, we use equation 4:

$$CAR_i(\tau_1, \tau_2) = \sum_{\tau=\tau_1}^{\tau_2} AR_{i\tau} \, , \qquad (4)$$

where CAR_i is the cumulative abnormal return for stock i and (τ_1, τ_2) reflects the time period which in this study is the chosen event window. (MacKinlay 1997.)

Finally, we calculate the cumulative average abnormal returns in the same way as the cumulative abnormal returns by using the average abnormal returns calculated in equation 3.

$$\overline{CAR}_i(\tau_1, \tau_2) = \sum_{\tau=\tau_1}^{\tau_2} \overline{AR}_\tau \, , \qquad (5)$$

where $\overline{CAR}_i$ is the cumulative average abnormal returns and $\overline{AR}_\tau$ is the average abnormal returns. (MacKinlay 1997.)

Finally, to test the statistical significance of the results from cumulative abnormal returns in each event window, we use the cross-sectional t-test with the following formula:

$$t_{CAAR} = \sqrt{N}\frac{CAAR}{S_{CAAR}} \, , \qquad (6)$$

where t_{CAAR} is the t-value, $CAAR$ is the cumulative average abnormal returns and N is the amount of mergers and acquisitions in the sample. S_{CAAR} is the standard deviation of the cumulative abnormal returns in the sample, also known as:

$$S_{CAAR}^2 = \frac{1}{N-1}\sum_{i=1}^{N}(CAR_i - CAAR)^2 \, , \qquad (7)$$

where CAR_i is the cumulative abnormal returns.

To examine whether the t-values received from the t-test are statistically significant, it is required to determine the level of significance, also known as the statistical rareness. When the results of the t-test are statistically significant, it is due to them occurring infrequently in a random sample in null hypothesis conditions. Most common levels of statistical significance used in academic research are 1%, 5% and 10% levels (Carver 1978.)

6. EMPIRICAL RESULTS

In this chapter, the empirical results of the two hypotheses are presented. First, the outcome of the first hypothesis regarding the cumulative abnormal returns of the whole sample of mergers and acquisitions is explained and secondly, the performance and results of horizontal and vertical transactions are presented.

6.1. Results on successful and unsuccessful mergers and acquisitions

In this study, successful mergers or acquisitions are considered as transactions which lead to the stock price of the acquirer being positive at the end of each event window under investigation. The abnormal returns are examined in a [-20,20], [-10, 10], [-5, 5] and [-1, 1] time window, presenting the results of average abnormal returns and cumulative average abnormal returns, also referred to as AAR and CAAR in the following tables. In addition to examining the development of the average and cumulative abnormal returns during the four event windows, we examine the final value of these returns and whether the stock value is positive or negative at the final day of each time window. In total, there are 59 mergers and acquisitions in the sample.

Table 2. Cumulative abnormal returns for [-20, 20], [-10, 10], [-5, 5] and [-1, 1] event windows.

	Mean	Median	Max.	Min.	Std. dev.	Skewness	Kurtosis	t-value	N
[-20, 20]	0,11 %	0,82 %	21,42 %	-36,39 %	0,11	-0,70	0,92	0,08	59
[-10, 10]	-1,11 %	0,38 %	15,11 %	-24,54 %	0,09	-0,68	0,45	-0,93	59
[-5, 5]	0,71 %	-0,43 %	14,08 %	-25,80 %	0,07	-0,80	3,03	0,77	59
[-1, 1]	-0,001 %	0,32 %	12,62 %	-12,14 %	0,04	-0,39	3,80	-0,003	59

Table 2 presents the results of testing the first hypothesis. It shows the statistics for the cumulative abnormal returns for all four event windows. None of the t-values of these event windows are statistically significant at 1%, 5% or 10% level of significance. This

is probably due to the whole sample including both successful and unsuccessful which results in the t-value being near zero as positive and negative cumulative abnormal average returns adjusts one another to zero.

The results in table 2 show that event window [-10, 10] has the highest t-value although not statistically significant. On average, the highest cumulative abnormal returns are found in the [-5, 5] event window. The highest cumulative average abnormal returns of an individual transaction occur in the [-20, 20] window where the returns are 21,42%. Similarly, the individual transaction destroying an aggregated amount of 36,39% of acquirer stock value occurs in the same [-20, 20] event window. However, as the t-tests show statistical insignificance for all four event windows, the first hypothesis is rejected.
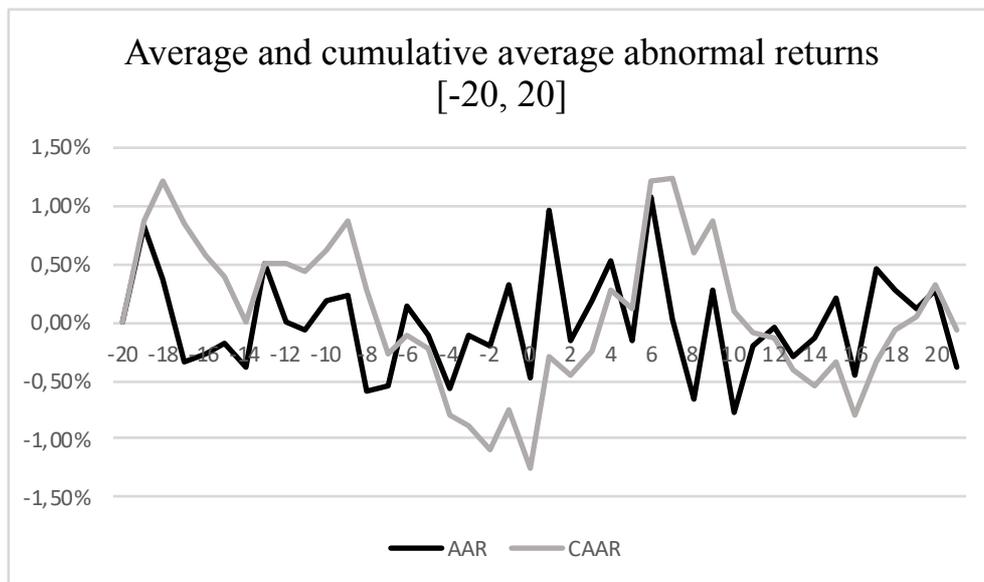

Figure 1. AAR and CAAR for the [-20, 20] event window.

Figure 1 shows the performance of the sample data stock performance during the [-20, 20] event window by measuring the average abnormal returns and cumulative abnormal returns. The figure presents that the average abnormal returns for this event window in the construction industry are unstable and although the stock market reacts positively to the merger or acquisition announcement at time 0, the stock price decreases back to the

pre-announcement level approximately at time +2. During [10, 20] the fluctuation in the average abnormal returns is smaller with an average abnormal return of -0,01% during this period compared to the average abnormal return of 0,08% during [-20, -10].

The results of the [-20, 20] event window in figure 1 suggest that during this event period, the mergers and acquisitions in the sample do not generate positive abnormal returns when these returns are measured at time 20. The average abnormal returns at time 20 are -0,39% and the average cumulative abnormal returns -0,06%, and thus the impact of the announcements on the stock prices is slightly negative in the [-20, 20] event window.

Table 3. Cumulative abnormal returns for successful and unsuccessful M&A's [-20, 20].

	Mean	Median	Max.	Min.	Std. dev.	Skewness	Kurtosis	N
Successful	8,71 %	7,18 %	21,42 %	0,82 %	0,06	0,27	-1,07	30
Unsuccessful	-8,78 %	-6,67 %	-0,07 %	-36,39 %	0,09	-1,60	2,88	29

For descriptive purposes of the variation between successful and unsuccessful M&A's, the sample transactions are then divided into two groups depending on their success or failure to generate positive or negative stock price development at time 20. Table 3 shows the statistical information of the successful and unsuccessful M&A's during the [-20, 20] event window. The sample of 59 mergers and acquisitions divides almost evenly in 30 successful and 29 unsuccessful transactions. Among the successful transactions, the most successful merger or acquisition generates a 21,42% increase in the stock price from time -20 to 20. Vice versa, the most unsuccessful merger or acquisitions destroys 36,39% of the stock value during the [-20, 20] time frame.
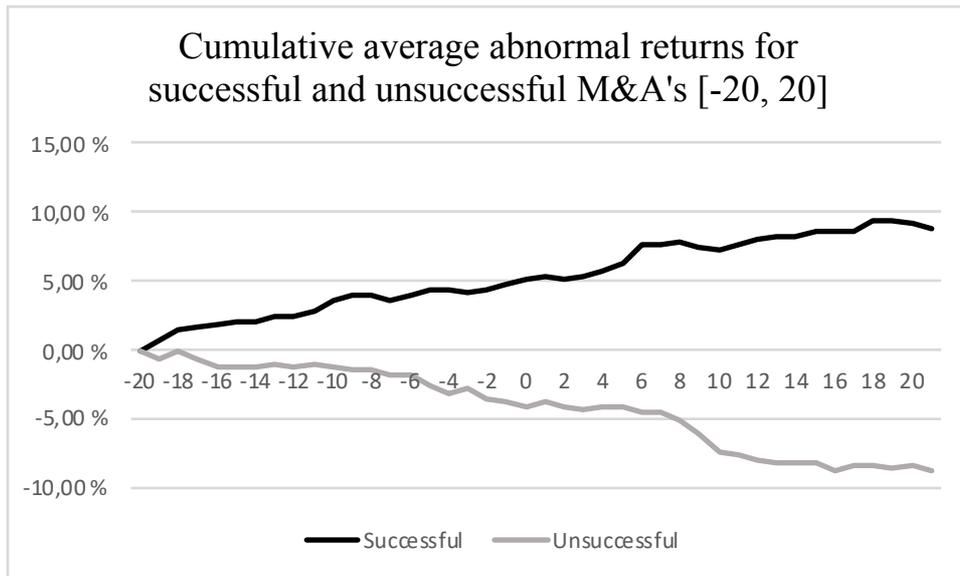
Figure 2. CAAR for successful and unsuccessful M&A's during the [-20, 20] event window.

Figure 2 shows the development of the successful and unsuccessful M&A groups during the [-20, 20] event window. The CAAR's for successful and unsuccessful M&A's at time 20 are 8,71% and -8,78%, respectively. Successful mergers and acquisitions have a constant positive increase of circa 5% in cumulative average abnormal returns both during time window [-20, 0] and [0, 20]. The cumulative average abnormal returns for the successful transactions are 5,27% for [-20, 0] and 3,44% for [0, 20]. For the unsuccessful M&A's portfolio, the cumulative average abnormal returns experience a larger decrease after the announcement during time window [0, 20] and at time [-20, 0] there is little fluctuation. The aggregated average abnormal returns for the unsuccessful portfolio are -3,68% at [-20, 0] and -5,10% at [0, 20].
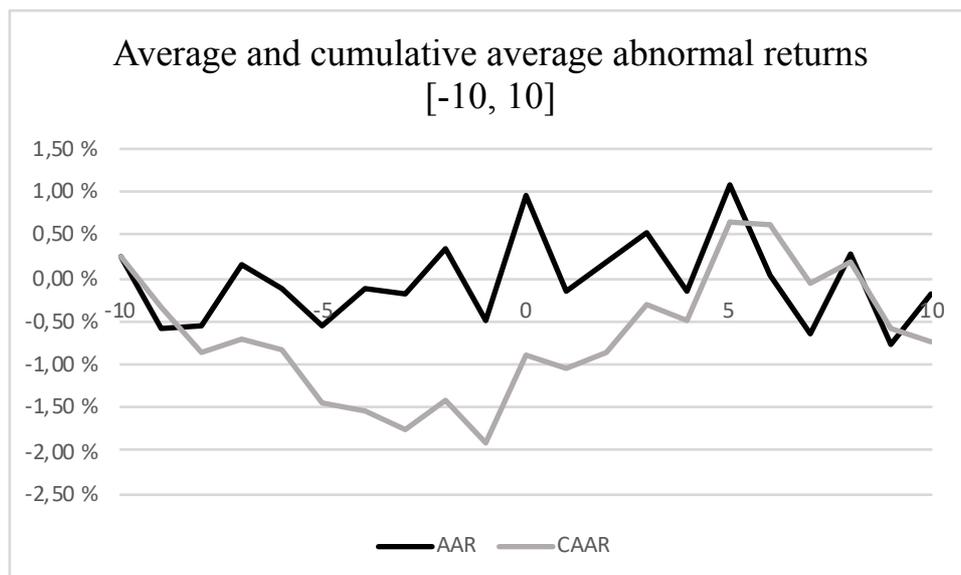
Figure 3. AAR and CAAR for the [-10, 10] event window.

Figure 3 presents the development of the stock price during the [-10, 10] event window. The figure of the average abnormal returns at time [0, 5] reflects the period after the merger or acquisition announcement and shows larger volatility in comparison to the time window [-5, 0] which reflects the time period before the announcement. At the end of the time period at day 10, the average abnormal returns are -0,19% indicating that in the end of this event window the average abnormal returns generate negative abnormal returns . Respectively, the cumulative average abnormal returns are -0,75%.

Table 4. Cumulative abnormal returns for successful and unsuccessful M&A's [-10, 10].

	Mean	Median	Max.	Min.	Std. dev.	Skewness	Kurtosis	N
Successful	5,67 %	5,17 %	15,11 %	0,07 %	0,04	0,71	-0,35	31
Unsuccessful	-8,62 %	-6,53 %	-0,26 %	-24,54 %	0,07	-1,26	0,51	28

Using the [-10, 10] event window, sample of 59 mergers and acquisitions continue dividing evenly into successful and unsuccessful transactions. The most successful M&A fails to generate as high cumulative average abnormal returns as in the [-20, 20] event window

and respectively, the most negative cumulative average abnormal returns of the unsuccessful portfolio succeeds to generate more positive, although still highly negative returns compared to the [-20, 20] event window.
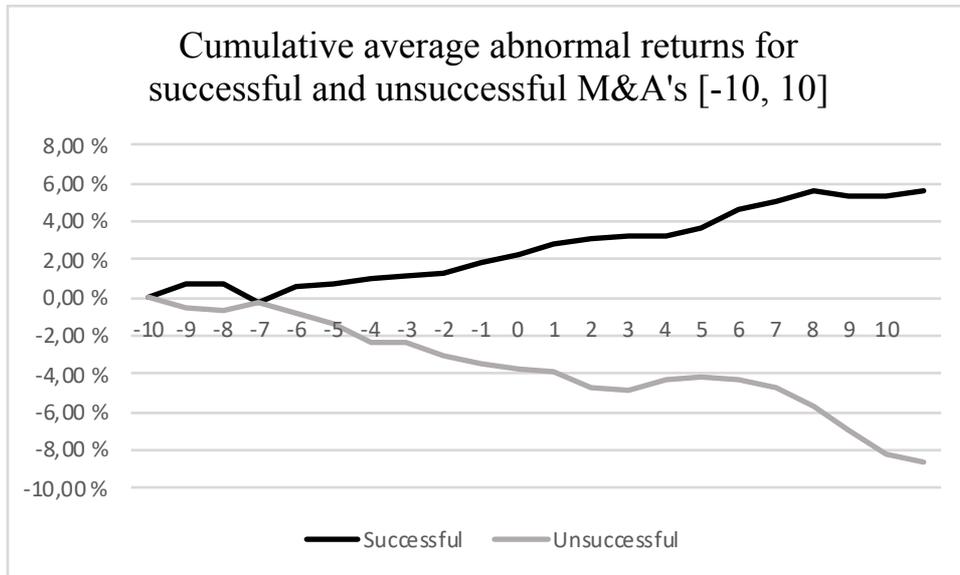

Figure 4. CAAR for successful and unsuccessful M&A's during the [-10, 10] event window.

Figure 4 shows the performance of the cumulative average abnormal returns in time frame [-10, 10]. It can be noted that during a more short-term event window, the CAAR's tend to fluctuate more and the positive or negative increase is not as constant as in time window [-20, 20]. However, the cumulative average abnormal returns for the successful transactions at time 10 are 5,67% which is 35% smaller than the returns at time 20 in the [-20, 20] event window. For unsuccessful transactions, the CAAR is -8,62% at time 10.
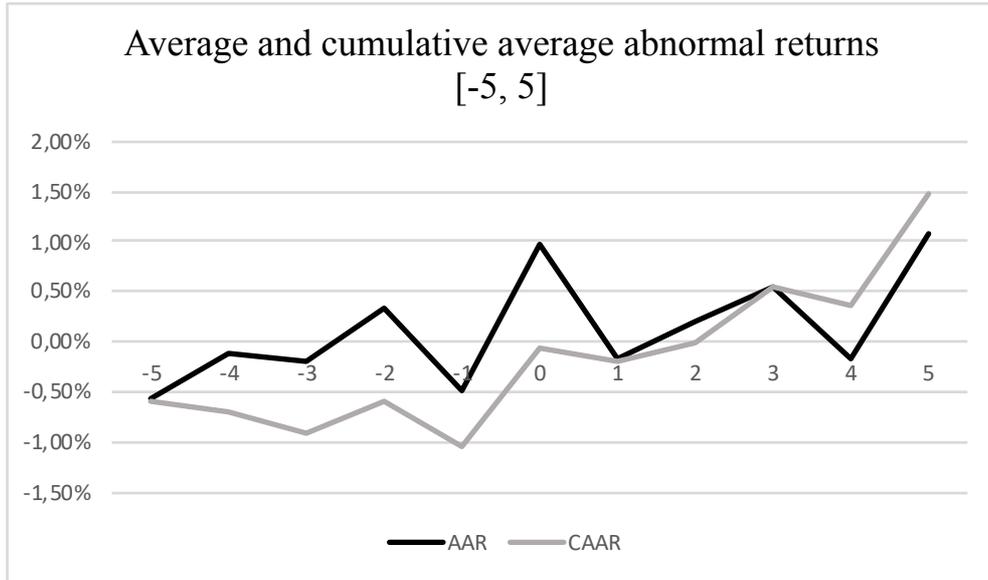
Figure 5. AAR and CAAR for the [-5, 5] event window.

Figure 5 presents average abnormal returns and cumulative average abnormal returns for the [-5, 5] event window. Both AAR's and CAAR's generate positive returns at time 5, 1,09% and 1,49% respectively. However, the reaction to the merger or acquisition announcement is negative at [0, 1] with abnormal returns decreasing by circa 1,1% on average. Similarly to the [-10, 10] event window, there is a trend of increasing positive interest in the stock prior to the announcement at time 0. These findings are consistent with the test results of Brealey et al. (2011) on pre-merger stock price development and fluctuation.

Table 5. Cumulative abnormal returns for successful and unsuccessful M&A's [-5, 5].

	Mean	Median	Max.	Min.	Std. dev.	Skewness	Kurtosis	N
Successful	6,13 %	5,73 %	14,08 %	0,78 %	0,04	0,63	-0,68	28
Unsuccessful	-4,18 %	-2,63 %	-0,07 %	-25,80 %	0,05	-2,95	9,75	31

Table 5 divides the sample mergers and acquisitions in successful and unsuccessful deals and shows the statistical information for the [-5, 5] event window. The minimum returns

in the table show that for the most unsuccessful transaction of the sample the cumulative abnormal returns decrease by 25,80% in ten days.
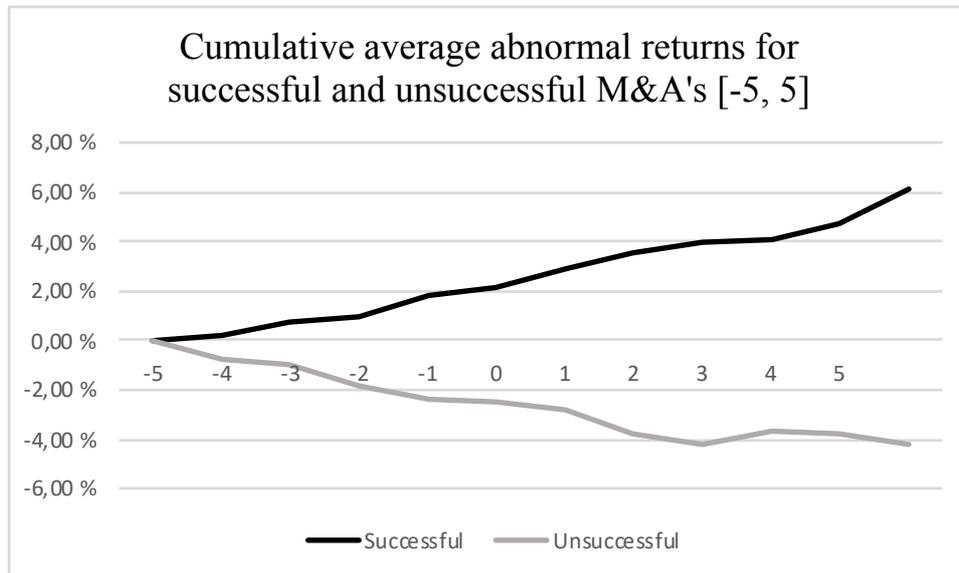

Figure 6. CAAR for successful and unsuccessful M&A's during the [-5, 5] event window.

The development of cumulative average abnormal returns for the successful and unsuccessful M&A groups are presented in figure 6. Successful and unsuccessful portfolios are generating steady returns during the [-5, 5] event window with the successful M&A's being positive and the unsuccessful negative throughout the complete event window. For the successful portfolio, the CAAR's increase at a slightly larger percentage on average. During [0, 5] the cumulative abnormal returns of the successful transactions increase 4% on average and thus, there are larger returns after the announcement of the deal compared to the pre-M&A period [-5, 0].
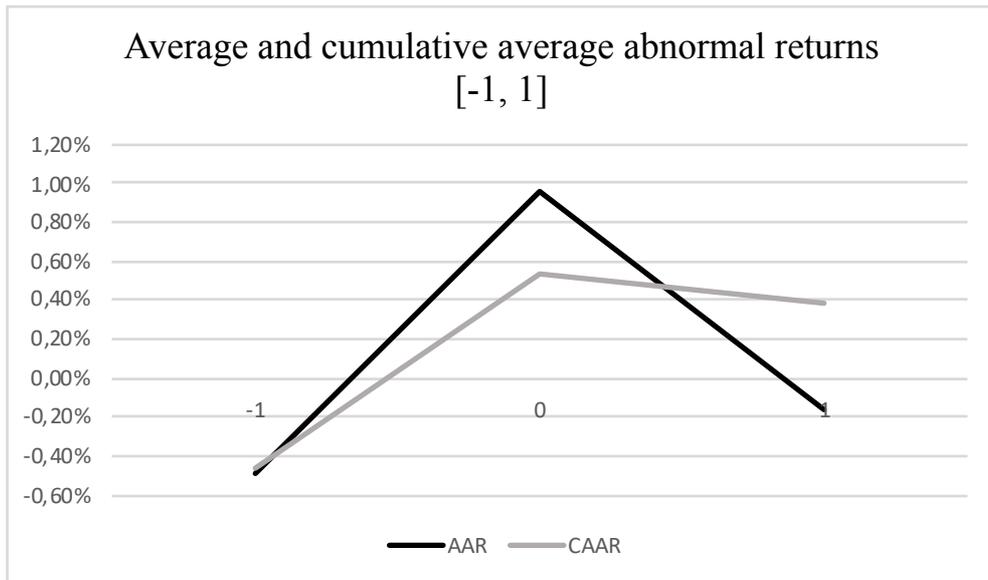
Figure 7. AAR and CAAR for the [-1, 1] event window.

Figure 7 presents the average abnormal returns and average cumulative abnormal returns for the sample stocks with the [-1, 1] time window. The figure consists of all the mergers and acquisitions carried out during the sample period from 2001 to 2019 in the chosen industry which makes it an appropriate measure of the abnormal returns in the construction industry transactions in Finland. This is also supported by the straightforwardness of the figure. Before the announcement of the merger or acquisition, the average abnormal returns and the cumulative average abnormal returns increase rapidly. The figure shows that after the announcement of a merger or acquisition at time 0, the market reacts negatively to the announcement and the average abnormal returns decrease in the way that at time 1, the average abnormal returns are -0,20%. However, this decrease reaches approximately to the same level as the average abnormal returns were one day before the deal announcement at time -1.

Results on figure 7 are also consistent with the findings of Brealey at al. (2011). The stock markets are the semi-strong form of market efficiency as investors react immediately to the merger or acquisition announcement and this is reflected in the abnormal returns of the stock at time 1. Longer event windows such as [-20, 20], [-10, 10] and [-5, 5] show

the fluctuation after [0,1] as there is private information on the stock markets and markets attempt to price the securities on an adequate price level.

Table 6. Cumulative abnormal returns for successful and unsuccessful M&A's [-1, 1].

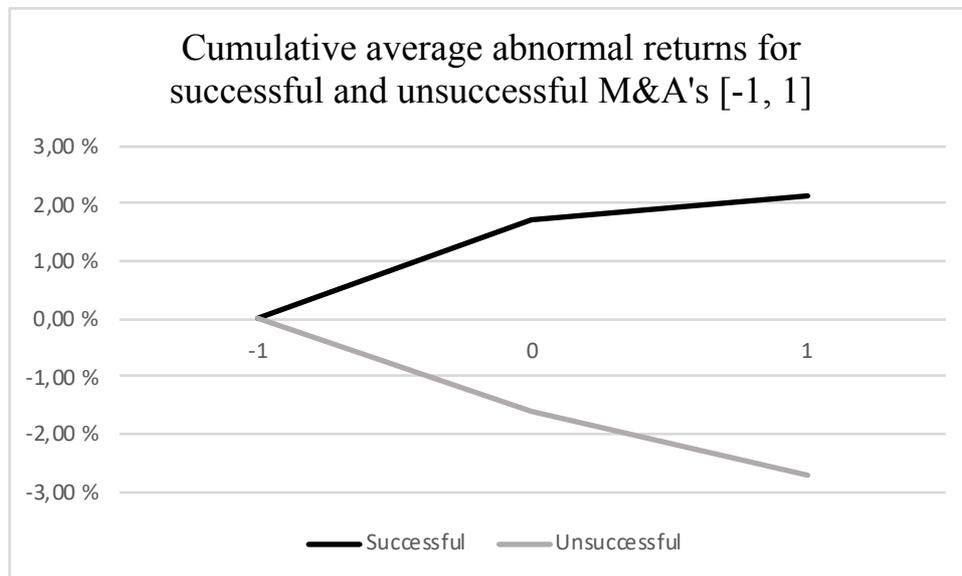|	Mean	Median	Max.	Min.	Std. dev.	Skewness	Kurtosis	N
Successful	2,14 %	1,30 %	12,62 %	0,21 %	0,02	2,82	10,42	33
Unsuccessful	-2,72 %	-1,63 %	-0,05 %	-12,14 %	0,03	-1,73	2,36	26

Figure 8. CAAR for successful and unsuccessful M&A's, [-1, 1] event window.

Using the [-1, 1] event window, there are 33 successful transactions and 26 unsuccessful when using the CAAR's of time 1 as an indicator of the success of a deal. The cumulative abnormal returns are on average 2,14% and -2,72% for the successful and unsuccessful portfolios respectively. The cumulative abnormal returns of the most successful transaction among the sample generates an increase of 12,62% in the abnormal returns in 2 days. The most unsuccessful deal destroys 12,14% of the stock value during the 2-day event window.

Overall, it can be concluded that mergers and acquisitions have an immediate impact on the price of the acquiring company's stock. There exists a decreasing trend in the security price after the M&A announcement at time 0 in this sample. However, there is not only large fluctuation in the price after the announcement but also during pre-announcement time period. This is in line with the assumptions of Brealey et al. (2011) that investors most often start noticing signs of possible coming mergers and acquisitions and thus, the stock price of the acquiring listed company gradually begins to increase or decrease creating fluctuation for the security price before the announcement at time 0. Similarly to Choi & Russell (2004), the measure of merger and acquisition success in this study are the cumulative abnormal returns. The findings support Choi & Russell's (2004) findings that the additional value created through these mergers and acquisitions does not differ from zero significantly.

The fluctuation post-announcement also indicates the uncertainty in the stock market. As mentioned earlier regarding market efficiency, semi-strong efficiency markets are not capable of including all possible information on the market, both public and private, in the stock price. Only public information is believed to be incorporated in the current security price. For this reason, there is uncertainty in the stock market and prices tend to fluctuate. It suggests that the markets are not capable of pricing the stock correctly and in the adequate level immediately after the announcement at time 1. In case of strong efficiency market, the price or average abnormal returns would increase or decrease to a certain value or a certain percentage at time 1 immediately after the announcement and remain at the same level with zero fluctuation post time 1.

These findings support the first hypothesis that mergers and acquisitions have a negative impact on firm value of the acquirer although the results are not statistically significant and thus, the first hypothesis is rejected at a confidence level of 95%. The results of the [-20, 20] and [-10, 10] event windows show that during these event periods, the mergers and acquisitions in the sample do not generate positive abnormal returns when the success is measured by the positive or negative sign of the cumulative average abnormal returns at the end of the event window. Event windows of [-5, 5] and [-1, 1] generate slightly positive cumulative average abnormal returns of 1,49% and 0,39%, respectively.

However, these results are not statistically significant. In addition, according to a study by Oler, Harrison & Aler (2008) event windows shorter than 5 days are considered as extremely short event windows for drawing conclusions of the success or failure of a merger or acquisition. Intermediate event windows of 6 to 60 days reduces the misinterpretation of the impacts of these kinds of announcements.

6.2. Results on vertical and horizontal mergers and acquisitions

To investigate the second hypotheses of this study, we divide the complete sample of mergers and acquisitions in two portfolios of horizontal and vertical transactions depending on the characteristics of the target company. In horizontal mergers and acquisitions the acquirer operates in the same industry as the target company and in the case of the transaction, the operations of the companies replace one another. In vertical mergers and acquisitions the parties operate in a different stage of the supply chain that provides the product or service. The sample is divided into 23 horizontal and 36 vertical mergers and acquisitions. The chosen event windows for investigating the second hypothesis are [-20, 20] and [-10, 10].

Table 7. Cumulative abnormal returns statistics for horizontal and vertical M&A's, [-20, 20] event window.

	Mean	Median	Max.	Min.	Std. dev.	Skewness	Kurtosis	t-value	N
Horizontal	-0,64 %	0,87 %	14,74 %	-20,08 %	0,10	-0,41	-0,61	-0,29	23
Vertical	0,25 %	0,01 %	21,42 %	-36,39 %	0,12	-0,87	1,53	0,12	36

Table 7 shows the statistical information of the cumulative abnormal returns for horizontal and vertical mergers and acquisitions in the [-20, 20] event window. The sample divides to 23 horizontal and 36 vertical mergers and acquisitions. On average, vertical M&A's create more value for the acquirer when measured by the average cumulative abnormal returns in a [-20, 20] event window. Horizontal M&A's destroy acquirer value on average by generating negative cumulative abnormal returns of -0,64%. However, in

the complete sample the minimum CAR of -36,39% is generated by a vertical merger or acquisition. The largest cumulative abnormal returns of 21,42% at time 20 are generated by a vertical merger or acquisition. The t-test shows statistical insignificance for the [-20, 20] event window.
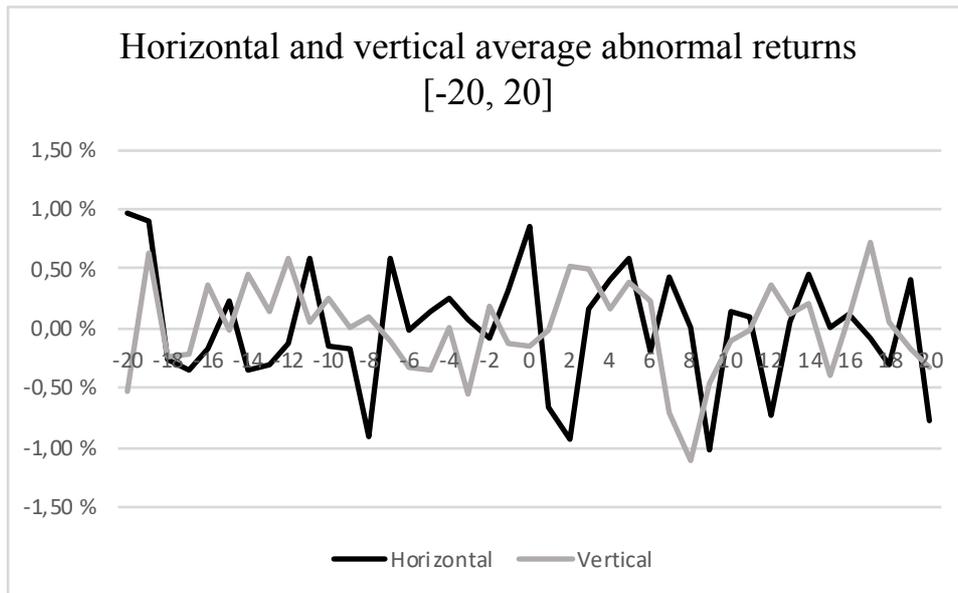

Figure 9. Average abnormal returns for horizontal and vertical M&A's, [-20, 20] event window.

Figure 9 shows the average abnormal returns (AAR) for the horizontal and vertical mergers and acquisitions during [-20, 20] event window. Fluctuation in the daily average abnormal returns is higher for horizontal transactions, the minimum being -1,01% and maximum 0,96%. For vertical transactions, the minimum is -1,10% and maximum 0,71%. Vertical mergers and acquisitions in the sample generate higher abnormal returns, however a moderate 0,0059% on average daily. There is a significant difference in the average abnormal returns between vertical and horizontal M&A's after the announcement at time 0. Horizontal transactions experience a steep decrease of average abnormal returns from 0,86% to -0,66% during [0, 1]. At [1, 2] the average abnormal returns decrease further to -0,93%. For vertical M&A's, abnormal returns generate on average positive returns almost immediately after the announcement. During event window [0, 1], AAR's increase

from -0,15% to -0,01% and during [1, 2] the average abnormal returns increase further to a positive amount of 0,51%.
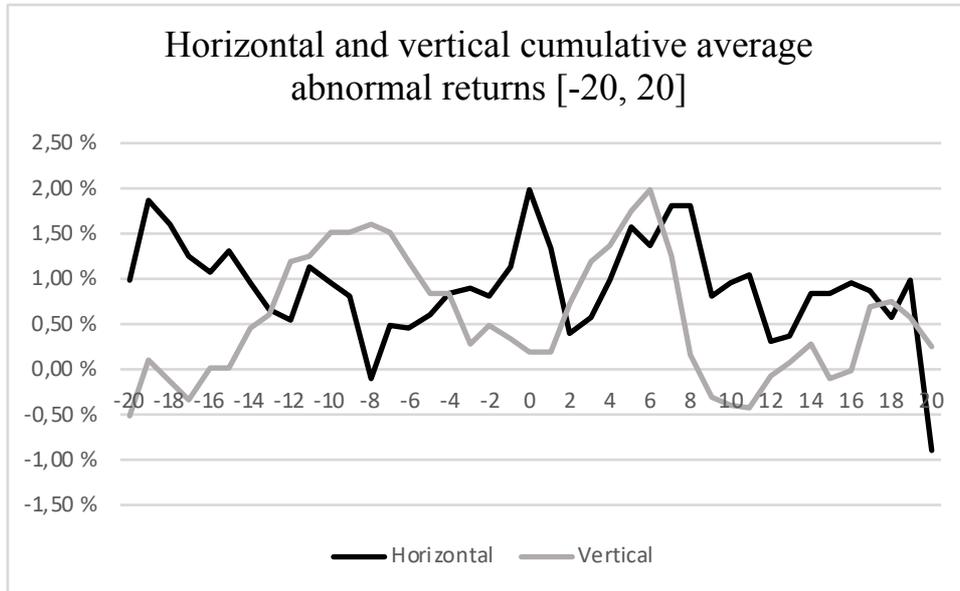

Figure 10. Cumulative average abnormal returns for horizontal and vertical M&A's, [-20, 20] event window.

Figure 10 shows the significant difference of the cumulative average abnormal returns of horizontal and vertical M&A's. At time 20, horizontal transactions have on average destroyed acquirer value by -0,92%, whereas vertical M&A's have on average a positive value of 0,24%. Similar fluctuation in both horizontal and vertical mergers and acquisitions can be seen in the CAAR's of event window [-20, 20] as in the average abnormal returns in figure 9.

Table 8. Cumulative abnormal returns statistics for horizontal and vertical M&A's, [-10, 10] event window.

	Mean	Median	Max.	Min.	Std. dev.	Skewness	Kurtosis	t-value	N
Horizontal	-0,84 %	1,35 %	15,11 %	-24,54 %	0,10	-0,97	0,47	-0,39	23
Vertical	-0,43 %	0,07 %	17,23 %	-27,27 %	0,11	-0,62	0,28	-0,24	36

Secondly, cumulative abnormal returns are examined in the [-10, 10] event window for both horizontal and vertical transactions. There is no significant difference in the maximum and minimum CAR of both type and both horizontal and vertical M&A's generate on average negative cumulative abnormal returns of -0,84% and -0,43% respectively. The results of the [-10, 10] event window are not statistically significant.
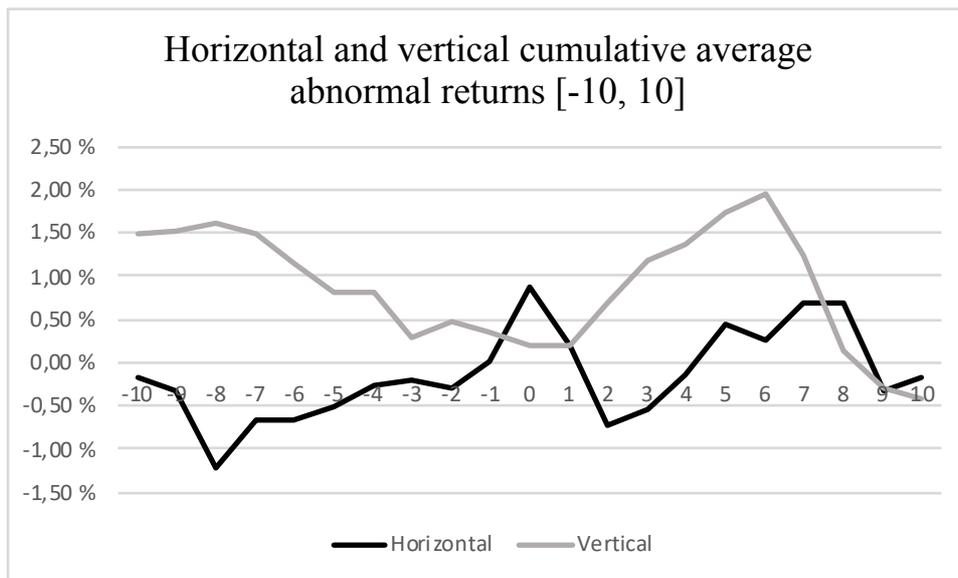

Figure 11. Cumulative average abnormal returns for horizontal and vertical M&A's, [-10, 10] event window.

Figure 11 presents the cumulative average abnormal returns of horizontal and vertical transactions and shows that at the end of the event window at time 10, both transaction types generate on average negative CAR's. For horizontal deals, the aggregated returns are -0,17% and -0,41% for vertical deals. The reaction to the merger announcement is positive for vertical transactions, potentially proposing that investors value vertical deals over horizontal ones. For horizontal mergers and acquisitions, there is an immediate negative reaction to the announcement which decreases CAAR's during time window [0, 2].

The second hypothesis of this study proposed that vertical mergers create more value for the acquiring firm than horizontal mergers do in the Finnish construction industry. This

is measured by abnormal returns and cumulative abnormal returns at the end of chosen events windows, [-10, 10] and [-20, 20]. Overall, the results show that using the [-20, 20] event window vertical mergers and acquisition generate not only higher but also positive aggregated returns than horizontal transactions. However, the t-tests show that these results are not statistically significant.

7. SUMMARY AND CONCLUSIONS

The purpose of this study is to examine whether mergers and acquisitions create value for the acquirer in the Finnish construction industry and whether there exists superior performance in either horizontal or vertical transactions. The sample of the study consists of 59 mergers and acquisitions carried out in the Finnish construction industry during the research period of January 2001 to January 2019. Similarly to previous event studies, the measure of M&A success are the cumulative abnormal returns of the individual stocks. As the cumulative abnormal returns are calculated as the aggregated difference between the chosen benchmark, OMX Helsinki index and the stock price, it is required that all the acquiring firms in the sample are publicly listed and traded at the Helsinki Stock Exchange. Typical for event studies, multiple event windows are chosen to examine the CAR's. In this study, the chosen event windows are [-20, 20], [-10, 10], [-5, 5] and [-1, 1]. To examine the first hypothesis, the sample is first divided to successful and unsuccessful mergers and acquisitions depending on their aggregated abnormal returns at the end of each event window. Furthermore, the sample is divided in horizontal and vertical mergers and acquisitions depending on the characteristics of the target firm to examine the second hypothesis.

The field of mergers and acquisitions and their impacts on firm performance has been a target of large previous research. Favorable economic conditions after the recession in the beginning of the 21st century increased the amount of transactions in numerous industries and after the subprime crisis occurred a seventh merger wave as the economies recovered from the crisis. Increased activity in mergers and acquisitions have thus sparked interest also among academic research. In the construction industry mergers and acquisitions have been seen as an essential part of corporate strategy aiming to accelerate growth, obtain synergies and expand operations to new market areas.

Theories on why firms involve with mergers and acquisitions have been developed to gain understanding on the background for M&A's. Theories of efficiency, synergies, hubris, empire-building and size build a foundation on the reasons for carrying out mergers and acquisitions. As there has been a large amount of research in the field of mergers and

acquisitions, numerous key factors for M&A success have been identified and these have been divided in pre- and post-merger factors. The key factor of the pre-merger process is an overall strategy that considers the evaluation of the partner, the size of the target, communication between parties, target valuation, the courtship period and future compensation policies. Post-merger factors consist of successful integration of the new target company, integration leadership and team, communication, realization of the synergies and possibly the most important post-merger factor, cultural fit.

The first hypothesis of this study proposes that mergers and acquisitions have a negative impact on firm value of the acquirer measured by cumulative abnormal returns. Previous research has showed that on average mergers and acquisitions involve a high risk of failure and often create negative abnormal returns for the acquirer post-merger leading to a failed M&A deal. The success of a M&A deal has been seen as a combination of multiple exogenous and endogenous key matters, however one specific internal factor, corporate culture, is considered to be the main reason for post-merger integration to fail and eventually in fact lead to firm value destruction.

The second hypothesis of the study is that vertical mergers create more value for the acquirer through abnormal returns than horizontal mergers do. Previous research has shown support on the differing success of vertical and horizontal mergers and found that vertical M&A deals on average succeed to accelerate firm value better than horizontal deals do. The wealth impact of vertical mergers on acquiring firms can be more extensive compared to horizontal mergers as they can increase profitability of the firm but also enhance production processes as the target company operates in a different stage of production than the acquirer in vertical mergers.

To examine the hypotheses of this study, rate of return of individual stocks for each trading day in the chosen event windows were first calculated. The returns of each stock were then compared to the benchmark index OMX Helsinki to obtain abnormal returns. These abnormal returns were aggregated to obtain the cumulative abnormal returns (CAR) of the sample and the value of the abnormal return at the end of each event window. To test the statistical significance of these results, the cross-sectional t-test was carried out.

The results of the study show that there is fluctuation in the stock price of the acquirers not only pre-merger but also post-merger. Stock market participants begin noticing signs of possible future transactions and thus, the stock price of the listed firm gradually begins to fluctuate already before the deal announcement. Immediately after the announcement the stock market reacts to the new information and attempts to price the stock accordingly generating price volatility. The test results of the [-20, 20] and [-10, 10] event windows show that mergers and acquisitions in the Finnish construction industry do not generate positive abnormal returns when the success is measured by cumulative average abnormal returns. The remaining event windows of [-5, 5] and [-1, 1] generate slightly positive, however extremely marginal cumulative average abnormal returns of 1,49% and 0,39%, respectively. However, the results are not statistically insignificant. Thus, the first hypothesis "*Mergers and acquisitions have a negative impact on firm value of the acquirer in the Finnish construction industry*" is rejected.

The results for the second hypothesis show that using the largest event window in this study, vertical mergers and acquisitions generate positive and larger cumulative abnormal returns than horizontal transactions. Horizontal mergers and acquisitions generate in fact negative aggregated abnormal returns. However, these results are found to be statistically insignificant. Thus, it can be concluded that the results reject the second hypothesis "*Vertical mergers create more value for the acquirer through abnormal returns than horizontal mergers do*".

The study has some limitations regarding the sample data and methodology. In order to obtain more statistically significant results, the sample data could include a larger amount of M&A cases. The statistical insignificance in the results of this study can also be due to factors behind the mergers and acquisitions that have not been taken into consideration and thus have resulted in certain type of mergers and acquisitions to be included in the sample. The sample data consists of Finnish publicly listed companies in the construction industry and the results are thus rather specific and concentrated on one country. The Nordic countries are well-known for their construction industry and pristine services and have been a target of large domestic and cross-country interest in mergers and acquisitions. When limiting the data on only Finnish firms, a vast amount of both large and

smaller Nordic mergers and acquisitions in the research period carried out by firms operating actively in Finland but not Finnish origin are left out.

Furthermore, the research is carried out using typical event windows for this kind of research in stock performance of mergers and acquisitions and other event studies. However, used event windows this short can lead to misinterpreting results and drawing biased conclusions of stock market performance. Thus, as a proposal of further research the hypotheses could be examined in longer event periods to obtain a more extensive outlook of the actual impacts of the deal on the stock value. As the stock market is also being heavily influenced with the economic conditions and possible crisis, further research could take these periods of crisis into consideration in interpreting the stock performance and merger activity.

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