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Master's Thesis

Gender diversity on corporate boards and M&A outcome: evidence from European listed companies

Author: Antonina Dudorova
1st Examiner: Professor Eero Pätäri
2nd Examiner: Associate Professor Sheraz Ahmed
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Abstract

Author: Antonina Dudorova

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Gender diversity in the workplace, including gender diversity in the decision-making positions of the corporations is one of the most discussed topics by both scholars and corporate world. The purpose of this thesis is to examine the relationship between fraction of women on boards of European listed companies and M&A outcome between the years. One of the behavioral biases influencing post-M&A performance is managerial overconfidence, which, as previous studies show, is more common for male directors. Fraction of female directors plays the role of overconfidence-mitigating proxy in relation to M&A outcome. The proxy used for indicating M&A failure is abnormal operating performance as suggested by Craninckx & Huyghebaert (2011).

Data sample consists of 279 finished deals across Europe performed in 2008-2014. Binomial logistic regression with industry and year fixed effects is used as an analysis method. The results show that fraction of female directors is negatively and significantly associated with the probability of deal failure. The result holds across the specific group of industries including agriculture, manufacturing, mining, trade, education, health, transportation, constructing and specific service activities.

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Lappeenranta, 23.10.2017
Antonina Dudorova

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1. Introduction

Board diversity is one of the most discussed topics in corporate governance studies, especially when it comes to gender diversity. Traditionally, the percentage of women on board was low. This fact can be explained by several reasons. Firstly, equal rights for women and men is relatively recent development: in the majority of countries, both genders were granted equal rights only on twentieth century. Secondly, women find it extremely difficult to enter an “old boys club”, which, as clear from the name itself, consists of men. Thirdly, women in the workplace face “the glass ceiling” effect: for most women, career development stops at the positions of middle managers and very few of them are able to get higher.

Moreover, the glass ceiling exists even if the woman is already on board or in the executive position: women are less likely to become CEOs or chairpersons of the board. Fourthly, the substantial part of the boards still includes women as tokens with no real decision-making power: those women are often board outsiders. To change the situation, women should represent the critical mass on the board. In addition, the discrimination in the workplace still exists and skills, abilities and professional qualities of women are often underestimated (de Cabo et al., 2011). Last but not least factor is that bigger proportion of women are brought up in a way that they will devote themselves to a family and not to the career; men, however, are usually brought up in a different way. This can be the reason why in certain cases men represent wider pool of talent than women.

In the last decade, however, the situation with board gender diversity started to change. In 2015, women held 15.1% of board seats globally, and the percentage of women on board has increased by 54% since 2010 (Catalyst, 2017). However, number of women on board varies greatly between countries even across Europe: from 32,4% in France (European Commission, 2014a) and 44% in Norway (European Commission, 2012), where mandatory gender quotas were introduced, or 22.1% in Finland, where gender diversity is recommended by Corporate Governance Code, to only 3,5% in Czech Republic and 2,7% in Malta (European Commission, 2014a).

Mergers and acquisitions, as well as other strategic corporate decisions, are affected by the board characteristics, either common (for example, the size of the board and the number of independent directors) or personal, such as age, ethnic background, tenure, education (e.g. Bange & Mazzeo, 2004, Liu & Wang, 2013). Martin (2016) reports that between 70-90% of all M&A activities fail to achieve expected goals and synergies. An extensive body of literature is devoted to finding the factors that enhance M&A failure; however, little attention is paid to the board diversity in this context. Nevertheless, scholars state that board diversity can enhance corporate performance by bringing different perspectives and viewpoints

(Alvarez & McCaffery, 2000). Therefore, studying whether M&A outcomes are affected by board diversity and especially gender diversity appears to be a relatively new field of study.

In addition to different perspectives benefits board diversity provides to the companies, women on board can benefit companies in a variety of ways. Decision-making skills of female directors help boards make better and more well thought decisions (de Cabo et al., 2011). Board gender diversity positively influences the reputation of the companies (Brammer et al., 2009), especially those who operate close to end customers. Female directors improve monitoring function of the board (Adams & Ferreira, 2009), as they are better monitors than male directors are. Directors in the boards with women in them have better attendance rates (Adams & Ferreira, 2009). Female directors have positive effect on corporate social responsibility (Bear et al., 2010), organizational performance (Frink et al., 2003) and are negatively associated with the probability of securities fraud (Cumming et al., 2015).

M&A activity in Europe varies from year to year. National European M&A markets are highly integrated, including common currency and economic area, therefore, it is especially important to consider them as a whole when studying the influence of different factors on M&A outcome. In addition, European M&A deals are regulated by a single body – European Central Bank (Thomson Reuters, 2014). The substantial part of studies examining the influence of different aspects of M&A performance are focused on the US market, and this is why bringing the European context would contribute to the existing body of literature about M&A.

1.1 Research question, objective and contribution

Board of directors is usually the governance body, which makes the decision about M&A, which is why considering board characteristics and whether they influence M&A performance is one of the most frequent questions in M&A studies. These studies can be divided into two branches: the first one is the influence of common board characteristics, such as size (Liu & Wang, 2013; Swanstrom, 2006), vigilance (Kroll et al., 2008), whether both boards are friendly (Schmidt, 2015) and the proportion of outside directors (Macdonald et al., 2008). The second branch considers personal characteristics of the directors: experience (Macdonald et al., 2008), number of boards the director sits in (Harris & Shimizu, 2004; Ahn et al., 2010) and gender (Levi et al., 2014). The last characteristic, however, came into the spotlight of academia relatively recently.

So far, little research was conducted on the women in M&A topic; moreover, authors did not find any evidence of the impact of women on board on M&A failure. However, this notion has strong theoretical foundations: take, for instance, the body of literature devoted by managerial overconfidence and M&A failure (e.g. Huang & Kisgen, 2013, Aktas et al, 2016,

etc.) and the fact that men are more overconfident than women (e.g. Huang & Kisgen, 2013). What is more, the research on gender diversity on board and its influence on different strategic decisions and performance of the companies could help to reduce biases and stereotypes connected with the presence of female directors on corporate boards and promote gender equality.

Considering all previously mentioned information, studying the effect of gender diversity in corporate boards on M&A outcome is a topic of interest from both scientific and practical viewpoints. Discovering the relationship between women on board and M&A outcome is the main objective of this research. The main question that needs to be answered during the research process is

Is the fraction of women on board associated with M&A outcome?

This study contributes to the existing body of literature by providing the evidence of the relationship between the proportion of female directors and M&A outcome from the European M&A market. In addition, this thesis is almost certainly the first paper about gender diversity and M&A outcome.

1.2 Thesis structure

This thesis includes eight sections. The first section is introduction, which gives the brief outline of the research theme, motivation, presents the objective of the research and research question and shows how the research gaps in gender diversity and M&A studies are filled. The second section presents the review of the existing body of literature regarding different aspects of board diversity and M&A. The third section explains the theory behind M&A performance and outcome, explains in detail different behavioral biases which appear in the M&A planning and implementation process, as well as why women are underrepresented on corporate boards. The fourth section gives the landscape of M&A market in Europe, as well as the state of women in the decision-making positions in business as a timeline through the years represented in the research sample. The fifth section draws the main hypothesis to be tested. In the sixth section, I present the research methodology, which includes model selection, the choice of the variables, data and model limitations I faced throughout the research process. In the seventh section, I present the results of the study, as well as robustness checks. Eighth section draws conclusions of the whole study and explains how the research findings can be useful for both academic and corporate use.

2. Literature Review

2.1 Women on board and its effect on company performance and risk

When it comes to gender diversity on board and its effect on company performance, evidence is contradictory. It may depend on the time the study was conducted, company and cultural differences, different perceptions of women around the world and different legal conditions. For instance, Adams & Ferreira (2009) found negative effect of gender diversity on board on market valuation and operating performance. As women are tougher monitors, performance of already well-governed companies decreases with the increase of the amount of women on board. Shrader et al. (1997) conducted similar study for 200 large firms in the US for the time period 1986-1995 and also revealed negative effect of gender diversity on companies' financial performance.

A significant fraction of the literature found no evidence of gender diversity impact on performance of the companies. Haslam et al. (2010) affirms that for British listed companies the effect of presence of women on board is insignificant in terms of accounting-based financial performance indicators and negative in terms of stock performance. One of the main reasons is common perception that women are employed as directors in poorly performing companies. Farrel & Hercsh (2005) found no stock price reaction on the appointment of the woman among Fortune 500 companies, however, female directors tend to work on better performing firms. A study of Danish and Dutch companies conducted by Marinova et al. (2010) revealed that the presence of women on board does not affect the performance of the companies, if measure the performance with Tobin's Q. Case study of four large US companies (Kochan et al., 2003) revealed no effect of gender diversity on firm performance, however, gender diversity significantly and positively affected group processes. Isidro & Sobral (2015) studied how women on board affect financial performance of 500 largest European companies. The researchers found no evidence of direct influence of female representation on board on companies' value. However, there is a positive effect of women on board on financial performance, which, in turn, affects firm value. Carter et al. (2010) presented another evidence from US firms that financial performance is not affected by gender diversity on board. Moreover, a global study of 22 000 publicly traded companies in 2014 (Noland et al, 2016) reveals that gender diversity does not affect financial performance. Francoeur et al. (2008) studied the performance of 230 out of 500 Large Canadian firms and found no effect of women on board on stock returns.

However, many scholars found an evidence of the positive influence of women in the boardroom on corporate performance. Adams et al. (2011) detected that female directors' appointments add more value than male directors appointments (data was taken from

Australian Stock Exchange). Adams & Ragunathan (2014) state that women in banking sector are risk-averse to the same extent as men or can be even less risk-averse, however, companies with higher percentage of women on board in a banking industry perform better. Carter et al. (2003) reveal the fact that the presence of women and minorities on board positively affects the value of the company, which is presented as the approximation of Tobin's Q. Dezso & Ross (2007) state that women on senior management positions positively influence firm performance apart from the CEO herself - having female CEO shows no impact on the performance.

A study of women on boards of banks in OECD countries (Gulamhussen & Santa, 2015) shows positive influence of female directors on bank performance. Consistent with previous studies, bank boards with women in them are more risk-averse. Campbell & Mínguez-Vera (2008) in the Spanish context revealed positive and significant relationship between fraction of female directors and firm value. Campbell & Mínguez-Vera (2010) stated that Spanish stock market positively reacts to the appointment of female directors. Cross-country study of Terjesen et al. (2016) indicated that on average, gender diversity on board positively influences the market performance of the companies and performance measures based on accounting values. Erhardt et al. (2003) performed the study of Fortune 100 companies in the US and also obtained positive effect of gender diversity on the performance of selected companies.

Frink et al (2003) suggest that organizational performance of the companies is positively affected by gender diversity up to a certain point, which is around 50%. If the fraction of women is more than the mentioned threshold, positive effect of the women on board gradually vanishes. The same method was applied to German companies by Joecks et al. (2013). In Germany, the point over which adding women to board decreases financial performance is around 30%. Adams & Ferreira (2004) discovered that companies with more volatile stock returns tend to have lower percentage of women on board (more possibly due to the overconfidence issue). The study by Jane Lenard et al. (2014) confirms this. According to their study, gender diversity on corporate boards results in less volatile stock market returns.

Gavious et al. (2012) in the study of US high-technology companies found that earnings management level decreases with the presence of female directors on board. Moreover, overall earnings quality increases with weaker monitoring functions of external auditors, which confirms the finding that women are tougher monitors. Cumming et al. (2015) established that the response of the stock market to the frauds of the companies with more gender-diverse boards is less severe. Moreover, in companies with higher gender diversity frauds are less likely to appear.

Finally, Gul et al. (2011) associated higher proportion of women on board is with more informativeness of stock prices. This informativeness is reached by better disclosure practices in big companies and improved mechanism of private information collection in smaller firms. Sila et al. (2016) suggest that gender diversity on boards has no effect on firm equity risk. Reutzel & Belsito (2015) find that the presence of female directors causes negative reaction of IPO investors in the US; however, this reaction is milder after SOX adoption.

2.2 Women in M&A

Studies of role of the female directors in M&A only start to develop and Levi et al. (2014) were one of the first scholars who have contributed to the development of this branch of literature. These scholars examined the relationship of gender diversity on board with the willingness to engage in M&A and bid premiums. The results revealed that firms with higher percentage of women on board tend to engage in less M&A activities than firms with lower percentage or no women on board. This result is consistent with Dowling & Aribi (2013), who also provided an evidence that companies with female directors on board make fewer acquisitions. However, their post-acquisition market returns are lower than for less diverse companies. Moreover, according to Levi et al. (2014), more women are associated with less bid premium for the company-acquirer and lesser cost of acquisition.

Another study on gender and M&A intensity was conducted by Chen et al. (2014) and supported previous results that women are more reluctant to engage in M&A, in addition, the deal size when women are involved is usually less. Bugeja et al (2012) state that in terms of finished acquisitions, gender diversity does not affect the bid premium or abnormal returns, however, acquirers, which engage in M&A activities and have women on board, perform better in the long run.

2.3 Behavioral differences of men and women in finance and management

One of the main differences between men and women in financial aspects of their life and managerial performance is overconfidence, which is more common for men. Huang & Kisgen (2013) confirm that male executives in the US are relatively more overconfident than female executives - men engage in M&A activities and issue debt more often than women do and women, in turn, are estimating more broad borders of returns and tend to exercise stock options earlier.

Another behavioral difference between men and women in terms of financing and strategic decisions is risk aversion. Jianakoplos & Bernasek (1998) state that women are significantly more risk averse than men when it comes to the financing decisions. However, Adams (2015) found an evidence that women that have chosen finance career are significantly less risk averse than their counterparties who has chosen non-financial career. The first are

approximately equally risk averse in comparison with men. What is interesting, there is a medical rationale beyond lower risk-aversion of women - risk aversion is connected with testosterone level (Sapienza et al., 2009). Thus, women with higher level of testosterone tend to choose more risky careers in finance. This phenomenon can partly explain the fact that female directors can be as risk-averse as male directors. Overall, female directors are risk averse to approximately the same extent as male directors; however, male directors are still more overconfident.

Women on executive positions tend to show solidarity and hire women (Matsa & Miller, 2011). Adams & Funk (2012) also found the differences in values between female and male directors. Women and men on board tend to aspire to different things - men care about power and achievement, whereas women care about the equality. An interesting finding is that male directors are slightly more risk-averse than women, which contradicts the hypothesis about lower male risk-aversion.

2.4 Women on board in Europe

Gender diversity on corporate boards in Europe is studied mostly on context of its influence on different aspects of corporate performance. A significant part of all board studies in Europe were conducted in the UK context. Wearing & Wearing (2004) in their study of female directors on boards of British companies found that female non-executive directors are less likely to be promoted within the board and make less money than their male counterparts. The study of Gregory-Smith et al. (2014) confirms it: women on board of FTSE 350 companies are paid less than men, are more likely to be appointed as non-executive directors, however, the wage gap is lower when a woman is an executive director. The same study found that the number of women on board is unrelated to the corporate performance.

Women on UK boards also affect the reputation of respective companies. Brammer et al. (2009) provided an evidence that gender diversity on boards of UK companies improve reputation of companies operating in B2C sector. When we are talking about the appointment of the directors in the UK, especially companies forming FTSE 100 index, there is no difference in stock price reaction to director appointment caused by gender if non-executive director is appointed. For executive directors, on the contrary, the difference in stock price reaction is significant (Lucey & Carron, 2011).

The existing body of literature in English concerning female directors of Nordic countries is relatively scarce although Nordic countries have the biggest number of women on board across Europe (European Commission, 2014a). Most of the research refers to Norway, which was the first country to introduce mandatory gender quotas for publicly traded companies in Europe. Ahern & Dittmar (2012) revealed that legal quota for mandatory

having 40% women on board in Norway, which was introduced in 2003 and came into force in 2005 with the transition period until the end of 2008, had significant and negative impact on the performance of Norwegian companies. Moreover, after gender quota in Norway came into force, 50% of firms changed their legal entity in order to not be exposed to the quota, which stated, that costs of changing legal entity to not optimal overweigh the costs of implementing the quota (Bøhren & Staubo, 2014). The same authors found that mandatory introduction of gender diversity in Norway negatively affected the value of Norwegian public companies (Bøhren & Staubo, 2016).

Speaking about Finland, Virtanen (2012) examines personal characteristics and roles of the female and male executives of the Finnish companies as well as their perceptions of own roles on board. The study found that a remarkable difference between men and women on boards of Finnish companies appear only in terms of age, otherwise directors of both genders are similar to each other. Female directors also see each other as more flexible and able to better adapt to changing conditions. Pesonen et al. (2009) points out that female directors in Finland have the same level of education and qualifications as male directors. For Sweden, more women on board is associated with lower ROA (Daunfeldt & Rudholm, 2012).

When it comes to all Nordic countries, Randøy et al. (2006) suggest no evidence that gender diversity affects financial performance of the largest companies. This conclusion is supported by Rose (2007) in the study of Danish public companies for the period 1998-2001, and by Marinova et al. (2010).

Spain is one of the relatively well-studied countries in terms of gender diversity on board partly due to the quotas on the number of women on board for public companies. According to Reguera-Alvarado et al. (2017), adoption of quotas in Spain has led to increased share of women on corporate boards and consequently to better financial performance. As I mentioned previously, Campbell & Mínguez-Vera (2008) spotted positive effect on companies' value brought by larger number of female directors on boards of Spanish companies. The majority of studies focuses on listed companies, however, Mínguez-Vera & López-Martínez (2010) studied gender diversity of SMEs, the majority of which are not listed anywhere. For Spanish SMEs, more women on board are associated with better financial performance. The size of the company has the reverse effect on the amount of women on board.

Italian listed companies are often controlled by families (Consob, 2015) and this context is important when studying gender diversity on boards of Italian companies. According to Bianco et al. (2015), female directors affiliated with families are more common for smaller companies with larger boards and high ownership concentration, which operate in the

sector of consumer goods and services. Women with no affiliation with families sit on boards with higher level of education and younger boards, which are also more independent. Women and family members on board negatively influence board attending behavior, moreover, women attend fewer board meetings than their male colleagues. In addition to that, more women on Italian boards result in better financial performance measured by Tobin's Q (Gordini & Rancati, 2017).

For Netherlands, Lückerath-Rovers (2013) provided an evidence that companies, which have female directors on their boards have better financial performance. In terms of women on board determinants in Dutch companies, the number of women on boards of public companies is influenced by the size of both company and board, segment on the exchange and industry (Lückerath-Rovers, 2009).

German companies have two-tier boards, are characterized by significant number of employee representatives and absence of independent directors (Rinehart et al., 2013). In Germany, presence of female directors is related to better CSR disclosure (Dienes & Velte, 2016). In addition, as was previously mentioned, for German listed companies, female directors are beneficial for the financial performance only up to the point where their proportion is 30% from the total number of directors, further addition of women start to negatively influence the performance (Joecks et al., 2013).

Nekhili & Gatfaoui (2013) reason that the determinants of female presence on French boards are size of both the company and the board and if the company is family-owned. Appointment of women on board is influenced by their demographic characteristics, such as education, experience and network size. For women on French boards, like on boards in the UK, there is a problem of double glass ceiling: it is significantly more difficult for a female director to become a chairperson than for a male director. Boubaker et al. (2014) negatively link the fraction of women on board to financial performance and reveal no influence of the presence of women on board on financial performance. Moreover, for French companies, more women on board are not associated with earnings persistence (Hili & Affess, 2012).

Speaking about Eastern Europe, the amount of studies on gender diversity on boards in English is as scarce as for the Nordics. In Poland, gender diversity on corporate boards does not affect financial performance of the companies (Kramaric et al., 2016). Furthermore, for Croatian companies, female chairperson positively influences financial performance. The same relationship applies to women as executive directors (Bohdanowicz, 2011).

2.5 Factors of M&A's success and failure

As the prospective model will base on the probability of M&A's success and failure, it is crucial to incorporate the existing literature regarding this question. Let us talk about the success factors first. Straub (2007) developed a model, where stated that the main determinants of post-M&A performance are financial aspects, strategic logic and organizational behavior. From the organizational behavior viewpoint, factors that positively affect post-M&A performance are the experience of M&A activities in the past, target company size and similarity of acquirer and target's culture. Among the financial performance factors are bid premium, the presence of due diligence and bidding process (the situation when multiple firms intend to acquire one target). Perry & Herd (2004) also pointed out the importance of due diligence as one of the key factors leading to a successful M&A.

Bellinger & Hillman (2000) reported the results from their event study that diverse and tolerant companies experience better stock performance after the M&A announcement. Venema (2012) named a comprehensive integration plan as critical factor of a successful M&A. The plan should align with corporate strategy, take into account organizational cultures of both acquirer and target, clearly divide responsibilities and describe in detail how to accomplish potential M&A benefits. Gomes et al. (2013) conducted a comprehensive review of the existing body of literature identifying the success factors of M&A. They divided these factors to pre- and post-M&A factors. First group of factors includes properly conducted target evaluation, bid price, size of both the acquirer and the target, previous experience in M&A, pre-M&A communication and proposed compensation policy. Second group (post-M&A factors) includes the strategy of integration, tempo of strategy implementation, communication and cultural differences. Case study of 4 mergers and acquisitions by Collantes & Jimenez (2007) defined several factors that influenced the success or failure of M&A: cultural differences, post-M&A planning, target industry knowledge, the choice of strategy, proposed estimations of synergy, bid premium, integration management, customers, due diligence, the speed of M&A, cooperation of target company management and clarity degree of the M&A purpose.

M&A failure is also driven by an extensive number of factors. Allred et al. (2005) named different size of the acquirer and target company as one of the reasons for M&A failure. As usually big firms acquire smaller ones, they replace the target's culture with own and do not bother to integrate cultures, which can lead to the deal failure. Moreover, acquiring the company, which is relatively too small or too big will most likely result in the outcome, which is not optimal. Apart from financial and managerial factors, one of the main reasons of M&A failure - not taking into account the human factor, which includes ignoring cultural differences, poor planning of post-merger integration, key employees leaving, overlapping

responsibilities and lack of research about the target company (Cartwright, 2002). The accuracy of inventory and accounts receivable is among the important reasons for M&A failure, which is usually not taken into account (Sagner, 2012).

Menon (2013) states that the main M&A failure factors are overly optimistic or pessimistic budgets and resources, underestimating the timeframe needed for the M&A implementation, lack of communication and scoping which is not accurate enough. Banal-Estañol & Seldeslachts (2011) name three conditions under which M&A deals are more likely to fail: these are lower costs of M&A, higher effort costs and lower complementarity level between the acquirer and the target.

2.6 Role of board of directors in M&A

As the main aim of this research is to examine the influence of women on board on the mergers and acquisitions activities, it is useful to analyze the literature directed to highlight the role of the board of directors in M&A. Speaking about managerial overconfidence issue, Kind & Twardawski (2016) revealed that directors' overconfidence has negative impact on abnormal returns after the M&A deal announcement, but positive impact on the bid premium. Ahn et al. (2010) came up with an evidence that multiple directorships negatively influence abnormal returns around the deal announcement date. However, overboarded directors (those who hold too many positions in different boards) positively influence M&A performance by providing business insights (Harris & Shimizu, 2004).

McDonald et al. (2008) in their study focused on the outside directors and whether their prior M&A experience positively influences current M&A performance. Authors have found strong support of this positive influence, even if the experience was unrelated to the current industry or product. Kroll et al. (2008) examined how board vigilance influences the M&A outcome. Authors point out that vigilance itself is not enough to enhance M&A performance - it should be combined with relevant experience. Then, vigilant and experienced boards positively influence post-M&A performance expressed as cumulative abnormal returns with the return window (-3; +3) and (-5; +5).

Board vigilance is also an important factor when measuring the effect of CEO tenure on M&A performance (Walters et al., 2007). When the board of directors is vigilant, shareholders pay less attention to CEO tenure in terms of M&A, which is expressed, again, in cumulative abnormal returns. However, in the absence of vigilant board, market reaction to CEO tenure positively rises until the tenure turns out to be around 8 years, and then the market reaction gradually worsens.

Schmidt (2015) in the study of friendly boards (boards, in which directors have social connections with CEO) found an evidence that friendly boards significantly influence M&A

performance. However, the influence can be either positive (when company experiences advisory needs) or negative (when company experiences monitoring needs). A study of interlocking directors (those who sit at the boards of the acquirer and the target at the same time) and their impact on M&A by Cukurova (2015) states that acquirers with interlocking directors are more likely to engage in M&A activities, especially in cases with high information asymmetry.

Stock-based part of director compensation, like have been suggested for the proportion of women on board, also has an inverted U-shape when it comes to the acquisition rate. Deutsch et al. (2007) based on a sample of S&P 1500 companies found that the equity compensation threshold, after which the intensity of acquisitions marginally decreases, equals to $414 000.

When it comes to the board characteristics, board size has negative impact on post-M&A performance when studied on companies listed on Shanghai Stock Exchange (Liu & Wang, 2013). However, for the US market Swanstrom (2006) found that the board size is significantly and positively influences the abnormal returns around M&A announcement date.

2.8 Industry aspects of gender diversity on boards

Industrial aspect is important when speaking about the impact of gender diversity on board on governance and performance. Traditionally, some industries are considered as male-dominated, for example, construction and transport (Arena et al., 2015), while others are considered as female-dominated, for example, education. Most corporate governance studies include industry fixed effects in their studies; however, the majority of these studies do not focus on board diversity on different industries. Still, there exists a body of literature, which allows to create relatively full picture when it comes to female directors in different industries.

Adams & Kirchmaier (2016) suggest that female directors are underrepresented in Financial and STEM (Science, Technology, Engineering and Mathematics) industries. The proportion of female directors in these industries is 24% lower than the sample average. Dong & Li (2017) find that female directors on boards of the automobile-producing companies reduce the efficiency of board decision-making. For creative industries, which, according to Dodd (2012) include publishing, advertising, design, music, arts, etc., the number of female leaders (not only directors, but also executives) is twice smaller than the average number of female leaders in the UK. Brammer et al. (2007) suggest that for corporate boards in the UK, the fraction of women on board is higher in Media, Finance, Utilities and Retail sectors, however, gender diversity here comes not from the fact that those industries are female-dominated, but the fact that those industries are closer to final consumers.

Arena et al. (2015) provided an evidence that increase in number of female directors in construction industry, which is traditionally considered as male-dominated, positively influences financial performance of the companies in this industry. Moreover, for male-dominated industries, Cumming et al. (2015) reveal that women on board reduce the probability of securities fraud more significantly in masculine industries.

From all previously considered articles, it can be concluded that overconfidence, which is often the plague for CEOs and directors, negatively affects M&A performance. Therefore, as women are less overconfident than men are, I have the grounds to suppose that the higher proportion of women on board will result in less M&A deals, which failed.

3. Theoretical Background

3.1 Information asymmetry in M&A

Information asymmetry is one of the central problems when considering mergers and acquisitions. It can take several forms: information asymmetry between the acquirer and the target or between stockholders and consequently directors, and managers, resulting in an agency problem, which will be more thoroughly explained later. For now, let us focus on the first case of the information asymmetry. Generally speaking, information asymmetry means that there is different amount of information available for different parties. For example, manager has more insights about the company than an investor does (Ross et al., 2013).

Information asymmetry between the acquirer and the target can appear, for example, during the bidding process and during the choice of the method of payment. Here, the target has an advantage over the acquirer: when the acquirer makes an offer, target accepts it if the offer price is higher than target value (Hansen, 1987). Therefore, the acquirer should take into account the price the target accepts and base its offer on it. In order to offset the potential losses connected with the information asymmetry, the acquirer can offer the payment not in cash, but in its own stocks. However, again, the acquirer knows more about its own value than the target does, which creates the situation with double information asymmetry (Hansen, 1987). Based on the proportion of the bid the acquirer is ready to provide in stock, target uses this as a signal of the value of the acquirer. The information asymmetry increases together with the size of the target. Therefore, the probability of using stock as a payment method also increases with the target size (Hansen, 1987).

In addition, information asymmetry in the bidding process appears because the acquirer has more information on what he plans to do to the target when the acquisition is complete and target shareholders do not have this information. In this case, target makes an assumption of the acquirer value based on the offer price (Hirschleifer, 1995). However, if we assume that it is not possible for a target to derive any information from the offer price, the acquirer makes an offer reflecting post-M&A gains. When it comes to the post-announcement performance, according to theory, when post-announcement acquirer returns are negative, the method of payment is stock and target is a public company, acquirer signals to the market that its stocks are overvalued. The opposite situation is also correct. This, however, does not hold for the takeovers of private companies due to reduced information asymmetry (Myers & Majluf, 1984). In practice, information asymmetry has mixed influence on acquirer returns. For equity offers for public targets, information asymmetry has negative effect on acquirer returns, whereas in other cases the information asymmetry has no or positive effect (Moeller et al., 2007).

Apart from information asymmetry between the target and the acquirer, Myers & Majluf (1984) describe the effects of information asymmetry between shareholders and managers of the acquirer when choosing the payment method. If the information asymmetry is in favor of the managers and they believe that the stock of their company is overvalued, they will more likely offer stock payment. However, this will be a signal to the investors, who in this case will lower the value by issuing additional equity. Amihud et al. (1990) further develop this notion by providing an evidence that for the acquirers, where managers own significant part of stock, cash will be more likely payment option. This happens because managers are not willing to weaken their control over the acquirer company. However, Martin (1996) argues that such choice of payment method is not the case for the acquirers, where managers own the significant majority of the shares and also where managers' ownership is insignificant. For middle range of ownership, the evidence found by Amihud et al. (1990) is confirmed.

Additional information asymmetry problem arises in cross-border deals. When the company enters foreign market through an acquisition of local company, the acquirer faces barriers connected with not knowing local culture as well as market insights locals have access to (Kogut & Singh, 1988). Information asymmetry in cross-border deals arises from distance between countries (Chan et al., 2005; Kang & Kim, 2008); language (Grinblatt & Keloharju, 2001); previous acquisition experience in target country (Kang & Kim, 2010) and cultural distance (Roth & O'Donnel, 1996). Thus, double information asymmetry is created – one between the acquirer and the target and one arising from country and cultural differences.

Moreover, information asymmetry is the prerequisite of insider trading, which, in turn, influences the choice of payment method. The amount of insider trading is positively related to the probability that the acquirer will make stock offer instead of cash offer (Yook et al., 1999). Information asymmetry also plays significant role in determining sale multiples in the takeover activity, especially if the target is private. Lower value of sale multiples can be explained by the fact that the acquirer is willing to protect himself against possible unfavorable information asymmetry (Officer, 2007).

In this thesis, however, the information asymmetry between managers and shareholders is the one of interest, because this asymmetry results in the agency problem, which will be explained in detail in the next paragraph.

3.2 Agency theory

Agency problem is not specific for mergers and acquisitions, or for corporate finance in general, but arises every time when one party (the agent) acts on behalf of the other party (the principal). In this situation, there is always some possibility of the conflict of interest between these two parties, which bears the name of agency problem (Ross et al., 2013). If we suppose that for acting on behalf of the principal, agent earns a certain fee, agent is

interested in this fee, which will maximize his utility and not in the utility of the act for the principal (Ross, 1973). However, the principal can make the agent act in a way that is best for the principal by monitoring the agent. This monitoring is associated with certain costs, which are called agency costs (Jensen & Meckling, 1976). Apart from the monitoring fees, agency costs include the costs arising from agent's obligation to do or do not do something (bonding cost) as well as the residual cost, which is connected with the utility loss for the principal after the agent is monitored.

Speaking about corporate environment, there is often the case when the ownership of the company is separated of the control on it. Usually managers have more full and detailed information about the state of the company and daily activities than shareholders do. Using shareholders' lack of information, managers often tend to increase the amount of company resources they control, which, in turn, results on emphasis on growth, even if it is not necessary or can harm the company (Jensen, 1986). Moreover, growth is positively connected to the compensation of managers, which is often tied to sales. The empirical evidence that for the CEOs of the acquirers, the compensation usually increases after the deal, confirms the theory (Harford & Li, 2007). In addition, the size of the company is positively connected with the CEO power and acquisitions can reduce the risk of being fired for a CEO (Gomez-Mejia & Wiseman, 1997).

Agency problem also arises when deciding on the payout policy. Here, the problem is connected with the free cash flow – cash flow, which is generated by projects with positive net present value. Shareholders prefer this cash flow to be paid out as dividends, while managers prefer it to stay within the company to finance more projects and growth (Jensen, 1986). This problem for shareholders can be reduced by issuing debt, thus encouraging managers for the payment of cash flows that will be generated in the future (Jensen, 1986). This benefits shareholders by giving them additional monitoring leverage: shareholders can declare bankruptcy if managers fail to fulfill their promise.

With regard to mergers and acquisitions, free cash flow theory together with an agency theory state that the probability of value destruction resulting from them is higher than the probability of value creation (Jensen, 1986). This happens because, as already mentioned, managers have preference for growth and are not willing to give out the significant amount of free cash flow, which results in bad takeovers. When determining the method of payment, managers are more likely to insist in cash offer instead of stock offer. There are some industries, where the inside the industry takeover is more likely to be value-creating and outside – value-destructing. This group of industries includes food, tobacco, oil, broadcasting and forest. (Jensen, 1986). Companies with the large amount of free cash flow perform well before the acquisitions and tend to acquire or merge with two main types of targets. The first type targets have poor performance and the second type are companies

similar to the acquirers – they generate large amounts of free cash flow and are reluctant to pay it out to the shareholders.

In poorly performing targets, however, managers show reluctance to takeovers. This happens mainly because the takeover is often connected with the restructuring in order to increase target efficiency. Managers by their actions create a situation where the company becomes a desirable target and, if the takeover happens, the inefficient managers are asked to leave. This in some cases creates the incentive for managers to reconsider their choices and act more efficiently (Walkling & Long, 1984). If the threat of takeover is not enough to increase managerial efficiency, managers with poor performance start to resist the takeover. Walkling & Long (1984) provided an empirical evidence, which connects the welfare of the managers with the reluctance to be acquired. The authors used cash tender offers to prove that the expected change in personal welfare of managers is strongly connected with their resistance to takeover: those managers who expect little change in their wealth are those against the takeover and the situation is reverse for managers expecting larger gains. Following Walkling & Long (1984), Agrawal & Walkling (1994) find that takeover negatively affects the compensation of the CEOs, especially overcompensated ones and they are often asked to leave the company after an acquisition. Overall, when the agency problem strongly affects corporate performance, managers of the acquirer will encourage the takeover and managers of the target, on the contrary, will resist it.

In mergers and acquisitions, agency conflict may arise not only from the relationship between the management and shareholders of the same company, but between the acquirer or the target and investment banker representing their interests as well. In the sense of information asymmetry, investment bankers help to lower the level of uncertainty between the deal parties. However, investment bankers can use this information in their own favor, which can result in worse deal results for both the acquirer and the target, but maximize the wealth of the intermediary (Kesner et al., 1994). The conflict can also arise from contrasting goals of the acquirer, which is willing to minimize the bid premium paid for the target shares, and the target, which goal is to obtain maximum bid premium. Kesner et al. (1994) find that the amount of bid premium paid in the deal is positively associated with the compensation of investment bankers, which indicates that the investment bankers act in favor of target and not the acquirer. However, the acquirer can reduce the negative influence of investment bankers on a deal outcome for itself by giving the managers the incentive to act in the interest of the acquirers, which is done by designing a contract in such way. The problem here is that the choice of compensation scheme for the investment bankers by the acquirers is not optimal (Kesner et al., 1994).

3.3 Behavioral foundations of mergers and acquisitions

Most of the corporate finance theories, including agency theory, assume that all involved parties are rational and act to maximize their utility. However, human nature is irrational even of those who sit in director chairs or make strategic decisions, despite the notion that CEOs and directors are not average people and, if the rationality is rewarded by high corporate positions, are more rational than the others are (Langevoort, 2011). Irrationality creates various biases, which influence these decisions. Let us focus more on those affecting M&A performance the most: managerial overconfidence, risk aversion, winner's curse and other biases.

3.3.1 Managerial overconfidence

As was already mentioned, information asymmetry creates uncertainty, and the actions of people experiencing this uncertainty are not rational (Roll, 1986). If the bidder is rational, he will engage in M&A only if the target is worth more than its market price. However, this is not always the case and M&A deals happen even when the market price exceeds the value of the target. This happens, among other reasons, because the decision-maker or decision-makers are certain that the company is undervalued by the market. This conviction is called managerial overconfidence or hubris. If the decision-makers are convinced in undervaluation, they will most likely overestimate the benefits that the takeover may bring as well as synergy gains (Roll, 1986).

Managerial overconfidence arises not only from personal traits of the managers or directors, but also from the previous experience of successful M&A, which is positively connected with the probability of appearing overconfidence (Dhir & Mital, 2012). Moreover, usually not one person makes the takeover decision, but a group of people (board of directors is an example) and if more than one person in a group had succeeded to create value for an M&A before, the overconfidence issue will multiply.

The influence of the overconfidence bias on different aspects of M&A is proven empirically. In relation to the topic of this thesis, male directors and executives are relatively more overconfident than their female colleagues (Huang & Kisgen, 2013). Male overconfidence in relation to the M&A activities were studied by Croci et al. (2010) in connection with acquisition gains in low valuation markets in comparison with high valuation markets. Managerial overconfidence turned out to affect the valuation gains in both high and low valuation market conditions negatively. In addition, overconfident executives tend to destroy value in terms of M&A (Malmendier & Tate, 2008). Moreover, market reaction is more strongly negative, when the M&A deal is implemented by overconfident managers.

Hayward & Hambrick (1997) state that CEO overconfidence results in M&A overpricing and significantly larger bid premiums. John et al (2011) consider overconfidence in M&A from the viewpoint of both acquirer and target CEOs. When both parties are overconfident, the

negative market reaction is significantly more severe than for non-overconfident CEOs or for the situation, where only one party is overconfident. Smit & Moraitis (2010) report that CEO overconfidence is one of the main mistakes the acquirer can make in case of serial acquisitions. This notion finds endorsement in the case of Vodafone described by authors. When M&A is not one off-event, announcement abnormal returns become significantly more negative for the second, third, etc. time. Billett & Qian (2008) link this phenomenon to executives' overconfidence. Aktas et al. (2016) suggest that CEO narcissism, which results in overconfidence, causes negative market reaction to the announcement. Moreover, if both acquirer and target CEOs are narcissistic, the deal is completed with lower probability.

3.3.2 Risk aversion

Risk aversion is studied in relation to decision-making. Kahneman & Tversky (1979) have developed prospect theory to explain through the experiments how people are irrational in decision-making under uncertainty and avoiding risk. Among other points, Kahneman & Tversky provide a critique of expected utility theory, which provided the explanation of risk aversion since the eighteenth century. Expected utility theory states that risk aversion prevails in decision-making under uncertainty. However, expected utility theory operates under assumption that all subjects of the economy are rational, which is not true in real life.

First, according to Kahneman & Tversky (1979), people are prone to certainty effect – they underweight outcomes with low probability and do the reverse to certain outcomes. Second, when considering different alternatives, people tend to focus on the components that are different for all of them and throw away those which are common – this phenomenon is called isolation effect. Third, people consider outcomes as losses and gains in relation to some neutral state, which, in turn, depends on their expectations. Thus, people tend to overestimate losses and underestimate gains (Kahneman & Tversky, 1979).

Most fields of corporate finance include decision-making under risk, and mergers and acquisitions are no exception. The reduction of risk is one of the most powerful motives when it comes to conglomerate takeovers (Amihud & Lev, 1981). Managers are proven to be averse to the employment risk and engage in conglomerate takeovers to secure their position in the company, which in some cases is not optimal and increases agency costs for shareholders. Hoskisson et al (1991), in turn, provided contrary viewpoint and found that managers are averse to the conglomerate deals because of not sufficient knowledge of the target industry and, consequently, need to process increased amount of information. Moreover, managers' commitment to innovation reduces after mergers and acquisitions, which is explained by the fact that both mergers and acquisitions and innovations are risky and the managerial aversion to another risky project increases as they have already implemented one (Hitt et al., 1990).

Speaking about risk-aversion of CEOs with relation to takeover activities, Hagendorff & Vallascas (2011) find that CEOs whose compensation is tied to risk-taking are more risk-averse and to lesser extend engage in risky takeovers. However, if risk-taking incentive is included into option part of CEO compensation, CEOs are more likely to engage in riskier takeover activities. This effect declines as firm size increases (Williams & Rao, 2006). CEO risk aversion also leads to higher valuation of the target, when the uncertainty decreases in serial acquisitions. Uncertainty, in turn, decreases with every following deal because CEOs gain more information and learn with every following deal (Aktas et al., 2009). CEO ownership is positively connected with the decision to expand under the turbulence – unpredictable and rapid change in the environment company operates in (Eisenmann, 2002).

Managerial overconfidence and risk aversion may offset each other: the underinvestment problem present in mergers and acquisitions can be solved with the help of managerial overconfidence (Sudarsanam & Huang, 2006). Moreover, in contrast with previous studies, authors provide an evidence that CEOs with compensation tied to the volatility of the stock returns demonstrate less risk aversion. These companies, as shown on a sample from the US, perform better after the takeover. Therefore, returning to the overconfidence, mild levels of it can improve post-acquisition performance. The problem here is how to decide, what overconfidence level is enough and what is excessive and can lead to losses.

3.3.3 Winner's curse

Among other biases, managers taking part in a deal, especially acquirer managers are prone to the winner's curse. Winner's curse is a bias present in any auction, including mergers and acquisitions. The main idea of this bias is that the bidder, who offers the biggest price, wins the auction and overpays for the item being sold. In corporate takeovers, because the information asymmetry, bidders do not have full information about the target and precise valuation is therefore difficult and the target value as seen by the acquirer is an estimate. Estimated target values vary from bidder to bidder and the acquisition is more likely to be made by the acquirer offering the highest bid premium. Therefore, in this case, bidder premium is bigger than the expected gains from acquisition (Varaiya & Ferris, 1987). Winner's curse is loosely connected to managerial overconfidence: overconfident managers are victims of the winner's curse and therefore tend to overpay for acquisitions (Roll, 1986).

Empirical analysis of US acquisitions in 1974-1983 conducted by Varaiya & Ferris (1987) confirms the presence of winner's curse in mergers and acquisitions. According to the authors, when takeover gains are lower than bid premium paid, post-acquisition abnormal returns are negative, while in cases where takeover gains is higher than bid premium, post-acquisition abnormal returns of the acquirer are positive. Further empirical evidence from

the same authors confirms winner's curse hypothesis (Varaiya, 1988). The winner's curse appears to different extent in different mergers and acquisitions. The influencing factors are the size of the divergence in relation to the acquisition gains between bidders, number of bidders and the degree of competition and winner's profitability before the acquisition. The influence of number of bidders on acquirer returns was further studied by Giliberto & Varaiya (1989) and Morck et al. (1990) and has proven to be significant. However, taking into account endogeneity between competition level and bidder returns, Boone & Mulherin (2008) find no relation between these two variables. Moreover, bidder returns do not decrease with an increase in the level of uncertainty about target value.

Acquirer, however, can avoid the winner's curse by gathering additional information, which lowers the information asymmetry effect on post-acquisition performance. Higgins & Rodriguez (2006) using the example of pharmaceutical industry, where R&D is a core business component, show that for the industries with high proportion of intangible assets, which are difficult to value, pre-acquisition alliances with the target, companies with research activities similar to the target or conducting similar research have positive influence on post-acquisition acquirer performance.

3.3.4 Other biases

Anchoring is one of the biases appearing in pricing and consequently applicable to mergers and acquisitions in the bidding process. Anchoring was first studied in detail by Tversky and Kahneman (1974), who stated that the first known value of a certain parameter would serve as an anchor for people who have to name the following values of this parameter. In relation to mergers and acquisitions, anchoring is proven to significantly affect offer prices (Baker et al., 2012). Recent peak target price, not reflecting the true value of the target, serves as an anchor, thus making and acquisition less profitable. Moreover, anchoring to the recent peak negatively influences post-announcement acquirer returns: investor consider such bidders as prone to overpayment (Baker et al., 2009).

Another bias affecting mergers and acquisitions is confirmation bias. It appears as the attachment of more importance to the information confirming the desirable outcome and initial views, while assigning less importance to the information confirming the opposite. Confirmation bias is relatively poorly studied in comparison with other biases and only experimental evidence is provided to confirm its influence on mergers and acquisitions. Bogan & Just (2009) suppose that confirmation bias is stronger for the executives than for other types of people, e.g., students. Executives are less likely to change their decision when new information about mergers and acquisitions appears.

Escalation of commitment or overcommitment to a certain deal can also be a value-destroying factor in mergers and acquisitions. Managers can be committed to a certain deal because of the following reasons: high competition level for the target, personal motives

(mostly the amount of time and effort spent on preparing acquisition) or the fact that the takeover decision is public. The explanation to this bias is managerial reluctance to give up the target when they have done a significant effort and spent a certain amount of money on a preparation. Lack of takeover experience of the CEO can also cause overcommitment to a deal, which, in turn, leads to overpayment (Haspeslagh & Jemison, 1991). The experimental study conducted by Haunschild et al. (1994) confirms the presence of escalation of commitment in mergers and acquisitions activities. However, it is still not clear how overcommitment affects acquirer performance. Considering individual deals, escalation of commitment was named by Bruner (1999) as one of the value-destroying factors in the deal between Volvo and Renault.

3.4 Why women are underrepresented on corporate boards

Apart from obvious reasons explaining lack of female directors on corporate boards, such as relatively recent granting of equal rights, common perception that women are more suitable to care for the children and therefore should not focus on their career, there is a number of theories providing an explanation why even now, when gender equality is promoted on different levels, women still represent the minority on corporate boards. These theories are resource-dependence theory and critical mass theory, both of them will be explained in detail below.

3.4.1 Resource-dependence theory

Resource dependence theory focuses on organizational characteristics of female representation on corporate boards. The main idea in the resource-dependence theory is thinking about an organization as an open system, which relies on external resources (Pfeffer, 1972). Uncertainty created by relying on external resources is costly. To reduce uncertainty costs, organization can establish ties with the most crucial entities providing external resources (Pfeffer & Salancik, 1978). One of the most important mechanisms connecting a company with external sources is a board of directors. Therefore, skills, ties and personal qualities of directors are sources of external dependency reduction. However, directors' skills and qualities should adjust to constantly changing external environment to ensure an effective link between company and external resources (Hillman et al., 2000).

There are three main ways organization can benefit from board links with and external environment:

1. Advice provided by the board. The main problem connected with achieving this benefit is infrequency of board meetings, lack of information in comparison to managers and insufficient participation in the implementation of company strategy.
2. Benefits connected with communication and preferences in the access to information.

3. Legitimacy. Directors influence making companies legit by ties with legitimacy-granting parties.

Adding female directors to the board can enhance each of these benefits. Diverse boards are more effective in providing advice and counsel because biases specific for each group are offset by diversity, but at the same time can lead to increase in the number of conflicts (Hillman et al., 2007). However, boards meet several times a year and make strategic and not routine decisions, therefore the diversity effect on enhancing benefits is more positive than negative. Female directors also provide additional legitimacy by fulfillment of legal gender diversity requirements for corporate boards. In terms of communication, women are closer to final customers than men, making the majority of purchases (Kanner, 2004), therefore adding women on board positively influences customer understanding. Female directors can bring additional ties to the board and last, but not least, they participate in female empowerment and serve as an example for other women.

Despite all the benefits, female representation on boards is negatively influenced by the homophily phenomenon. Homophily in board of directors context is the preference to choose one group of people as directors over others because of the perceived linkage between usefulness of the directors from a certain group and their power (Pfeffer & Salancik, 1978). It is quite easy to figure out that men are the power group on corporate boards. When it comes to the empirical evidence of the predictors of female representation on boards, size, industry, diversification strategy and ties with other boards having female directors in them are proven to have significant influence of the fraction of women on board (Hillman et al., 2007).

3.4.2 Critical mass theory and tokenism

Tokenism was introduced by Kanter (1978), who provided an evidence of the sex ratio affecting group behavior. Groups where men or women represent the majority, behave themselves differently than balanced groups. Group minorities, or so-called tokens, experience inequality in relation to dominant group: they stand out from the group; therefore, the pressure on them is higher. On corporate boards, where men still sit in the majority of director chairs, women indeed can be considered as tokens.

In imbalanced groups, dominants tend to exaggerate the aspects in which they are different from the tokens and try to exclude tokens from the group based on these aspects. Thus, tokens become isolated from the group and they can either make attempts to become an insider or demonstrate the dominants that their behavior is different from the perceived typical behavior of their group (Oakley, 2000). The situation worsens by male directors linking the female presence on board with the reduced payment for all, as there is a gender pay gap and women are paid less than men in general. Isolation connected with tokenism negatively affects mental health and productivity of female directors. As I already mentioned

in the literature review part, women experience difficulties in becoming chairs of the board, which is proven empirically (Wearing & Wearing, 2004; Gregory-Smith et al., 2014). Tokenism theory explains it by barriers to necessary information and connections created by the dominant group.

Companies often include women on corporate boards because of the positive effect on company reputation and meeting legal requirements. However, one woman on board has very high probability to become a token and fail to significantly influence strategic corporate decisions. Moreover, with one woman present on board, male directors are reluctant to add more women (Adams & Ferreira, 2009), which confirms seeing women as tokens.

To have an influence on corporate strategy, female directors should represent a critical mass. Critical mass theory was developed by Rosabeth Kanter as well as tokenism theory. Critical mass theory suggests that size of the minority group within the main group directly affects the influence of the minority group. There exists a certain threshold, above which the influence of the minority group becomes visible (Kanter, 1987). Therefore, corporate boards as male-dominated groups start to experience female influence and listen to their voices only when the fraction of women reaches the critical threshold.

Here the logical question arises: what number of female directors is a critical mass? The study of Erkut et al. (2008) suggests that the number of female directors should be equal or more than three for women to become a critical mass. Torchia et al. (2011) confirm this number: Norwegian companies with three or more women on board have higher levels of innovation. Moreover, even the transition from one to two women improves innovation level in the company as well. In male-dominated industries, such as construction, women representing the critical mass improve corporate performance (Arena et al., 2015). However, evidence from Adams and Ferreira (2009) opposes the view that women below the critical mass are tokens in terms of corporate performance and governance. Simple presence of female directors positively influences board attendance and have significant influence on the performance measured by Tobin's Q.

3.4.3 Other reasons

Old boys network, created, as seen from the name itself, by men, is one of the reasons for scarcity of female directors. Old boys network is informal director network created through friendships or personal connections and this network ensures that the majority of board seats is occupied by men. These men see women or men with less power as a threat and this view creates entry barriers for them (Oakley, 2000). Women on board have to constantly prove to the old boys network that they are competent and worthy, because otherwise they will not have access to the internal information necessary for the functioning as a director. Moreover, men on executive positions admit that women are subjects for more competency

testing procedures. Women are also first candidates to quit the board during hard times (Gordon, 1992).

Female directors are also subjects to double-binds, which means there is no possibility for a person to win regardless her/his actions. On executive positions and corporate boards, women should employ male leadership styles, because only that makes men take them seriously. However, if a woman acts aggressively, in most cases she will be labeled as a 'bitch'. Thus, feminine traits on boards are associated as weakness and incompetence, but too much masculinity in the behavior is also perceived negatively (Oakley, 2000).

Last, but perhaps one of the most powerful reasons why women are underrepresented on corporate boards and executive positions I would like to address are gender stereotypes. Gender stereotypes include a whole lot of perceptions: women in general are more emotional and less stable, lack analytical skills, worse leaders than men and lack self-confidence. In contrast, men are perceived to have opposite traits, therefore having more chances to be appointed to managerial and director positions. Men may be reluctant to work under female supervision because they consider women as underqualified even if it is not true (O'Neill & Blake-Beard, 2002). Surprisingly, women are even considered worse candidates to be managers than men because of how they dress, the tone of their voice and appearance. Attractive women are perceived as lacking necessary qualities more than the others and therefore experience even worse stereotype influence (Heilman & Stopeck, 1985).

4. Overview of M&A market and women on boards in 2008-2014.

This chapter provides the landscape of European M&A market and position of women on corporate boards during the years of interest (2008-2014).

2008

In 2008, men occupied 9 out of 10 director positions in Europe (European Commission, 2008). For the CEOs or chairpersons, situation with gender diversity was even less favorable – only 3% of chairpersons and CEOs across Europe were women. Cross-country variation in the proportion of women on board existed: the highest proportion of female directors was achieved in Norwegian companies, with gender quotas for public companies introduced in 2003 and the end of the compliance period in 2008. Fraction of female directors was above average for the new EU-members – mostly Eastern European countries: Poland, Czech Republic, Bulgaria and Slovakia (European Commission, 2008).

The most gender-imbalanced boards were observed in Cyprus, Malta, Portugal, Italy and Luxembourg. 38% of European companies did not have female directors on boards, which made companies with female presence on board the majority. However, only 28% of companies had more than one female director, which can be explained by tokenism considered earlier. The countries where at least 50% of the companies had more than one female director were Sweden, Denmark, Norway and Germany.

In 2007, the equality law was launched in Spain, strongly advising to increase the share of women on board to 40% in 8 years. The government offered benefits for the companies implementing gender rules quicker, but did not impose any sanctions until the end of 2015.

Due to the global financial crisis, in 2008 a record number of M&A deals were withdrawn (Saigol, 2008). European M&A activity declined by 34% in comparison with 2007, while global M&A market declined by 28% (Vaughan, 2008). The number of European transactions also declined by 26% (WilmerHale, 2009). The largest mergers and acquisitions included the acquisition of Swiss tobacco company Phillip Morris by US Atria (71.2 billion EUR), the acquisition of German automotive industry giant Continental by another maker of auto parts Schaeffler (23 billion EUR). Largest M&A transactions with the participation of state entities were buying of HBOS and Bank of Scotland's shares by HM Treasury and Dutch government acquisition of ING and Fortis.

The biggest volume of deals was conducted by Germany with 25% of total volume, while the UK and Ireland were the second, bringing 25.1% of total volume together. France experienced the steepest decline in volume: from 14% in 2007 to 5.2% in 2008 (Vaughan, 2008).

2009

In 2009, situation with gender diversity on boards as well as women in CEO or chairperson positions had hardly changed (European Commission, 2009). Apart from Norway with quotas, where fraction of female directors had increased from 41% in 2008 to 42% in 2009, two Nordic countries had more than one-fifth of female directors on public companies: Sweden (28,6%) and Finland (23,6%). Moreover, with decreasing company size, fraction of female directors decreased as well. Gender quotas for public companies were discussed in French and Dutch governments, but did not came into force in 2009. Countries promoting gender equality on corporate boards – Finland, Sweden, Spain, Belgium and Germany - mostly stuck to the recommendations in the Corporate Governance Codes.

In 2009, decline in both M&A deal volume and number continued. Deal volume decreased by 24.6% in comparison with 2008, while deal number fell by 5.2%, which indicates that the deals in average became smaller (Bureau van Dijk, 2009). HM Treasury continued to acquire local financial industry companies: the biggest deal of the year was acquisition of the Royal Bank of Scotland worth 36.2 billion dollars. Moreover, UK appeared the most targeted country: in the biggest non-financial European acquisition performed by Kraft Foods, UK Cadbury was the target (deal value – 16.3 billion dollars). As a result, the UK contributed to the total volume the most, bringing 30.5% of total deal volume. The second and the third countries measured by volume were Spain and Germany with 11.5% and 10.8% respectively.

The largest deal of the year without the UK involvement was the acquisition of Spanish Endesa, operating in gas, electricity and water industries, by Italian Enel for 13.4 billion dollars. Banking, gas, electricity, water and other services industries brought the biggest volume share with 35%, 11.1% and 19,1% respectively (Bureau Van Dijk, 2009). Among the Eastern European countries, Russia was the most targeted; however, the majority of large deals for Russian targets were domestic: take, for instance, an acquisition of Atomenergoprom by the state corporation Rosatom with the deal value of 10.42 billion USD. The deal volume for Eastern European countries, as well as for Western European countries, fell by 31.5%.

2010

In 2010, situation with the presence of female directors slowly started to improve. The proportion of women on board among European countries had increased from almost 11% in 2009 to 12% in 2010. Still, the proportion of female CEOs and chairpersons remained the same as in previous two years (European Commission, 2011a). The fraction of female directors in Norwegian public companies, however, decreased from 42% to 39%. Among already mentioned countries, Romania had joined the club with relatively high proportions

of female directors – in 2010, women sat in 21% of board chairs of Romanian public companies.

More companies started to include female directors into the boards: 66% of companies had at least one woman on board in comparison with 62% in 2008. However, companies were still reluctant to include more than one female director: half of the companies with female presence on boards had only one woman as a director (European Commission, 2011b).

Speaking about legal actions promoting gender diversity on corporate boards, Corporate Governance Code in Finland started to include the recommendation to have at least one female director, and if not, provide an explanation why female director was not included. As a result, the percentage of Finnish companies with female presence on board increased by 23%. German Corporate Governance code for the first time included recommendations regarding board gender diversity: the Code did not include any numbers for female representation, but recommended female presence and included the obligation to disclose non-compliance (Deloitte, 2013). Among individual companies, Deutsche Telecom was the first to introduce corporate gender quota: according to it, female directors and senior managers should represent 30% from a total number by the end of 2012. In addition, Iceland joined the number of countries introducing mandatory quotas on female representation: by 2013, at least 40% of directors in public and public limited companies should have been women. The second country to introduce quotas in 2010 was the Netherlands: the requirement was at least 30% of female directors and senior managers by the end of 2018. The quota legislation did not include any sanctions for non-compliance.

2010 was remarkable by further weakening of M&A activity. The deal volume in 2010 represented only 73.2% of the 2009 volume (Bureau van Dijk, 2010) and was the lowest in the last six years. The largest deal of the year was the purchase of additional 52% of shares of the Swiss eye-care giant Alcon by another Swiss pharmaceutical giant Novartis, the value of the additionally purchased shares accounted to 28.3 billion USD. The remarkable deals of the year were also the second bid of Craft Foods on Cadbury (17.4 billion USD), purchase of the stake of 33% in Deutsche Bank by undisclosed acquirer (14.09 billion USD) and full acquisition (buying additional 50% of the shares) of Brasilcel operating in Brasil and registered in Netherlands, by Spanish Telefonica (10,11 billion USD).

Among the most targeted countries, UK remained the leader, bringing 26.9% of total deal volume and 30.7% of deal number. Germany gained the second place by value with 11.4% of total value of deals and thanks to the acquisition of Brasilcel, the Netherlands has risen to a third place with 10.5%. France was the second by the number of deals, contributing 10.9%, however, remaining fourth by the deal value. The most targeted industry sectors in 2010 were banks, other services and machinery and equipment. Unlike for Western Europe,

deal value for Eastern Europe has risen by 18.2%. Russia, bringing the greatest share, contributed in the increase the most: deal volume for Russia went up by 33.7% (Bureau van Dijk, 2010).

2011

2011 was marked by further increase of the proportion of female directors – their share has risen to 13.6% (European Commission, 2012). The proportion of female CEOs and chairpersons, however, declined to 2.7%. Only five countries in the European Union in 2011 had more than 50% of boards with female presence: France, Sweden, Germany, the UK and Finland. Following the path of Norway and Iceland, in January 2011 France introduced mandatory quotas with the same target percentage of female directors (40%), which should have been achieved by 2014. Directors in the companies failing to comply would lose their mandates. As a result, fraction of women on boards of the French companies almost doubled – from 12,3% in 2010 to 22,3% at the end of 2011. Following France, Bulgaria, Slovenia, Germany, Czech Republic and Netherlands demonstrated significant increase in the proportion of female directors – 4% for Bulgaria and Slovenia, and 3% for Czech Republic, Netherlands and Germany. However, fraction of women on board declined in Slovakia, Romania and Hungary (European Commission, 2012).

Together with France, several European countries also introduced quotas in 2011. Belgium targeted female representation of board to be one-third in state-owned companies by the end of 2012 and in all public companies by the end of 2016 (European Parliament, 2012). Non-compliance led to sanctions, which were temporary benefits loss for the directors. Austria adopted quotas for state-owned companies, for which the fraction of female directors should increase to 35% by the end of 2018. Italy stated the threshold of 30% female participation by 2015; non-compliance would lead to the annulment of board actions.

In 2011, European M&A market demonstrated growth for the first time since 2007, which is connected with the fact that European companies started to recover from global financial crisis of 2007-2008. The market grew by 6.9 percentage points in value, reaching 825 billion USD in absolute numbers (Bureau van Dijk, 2011). Two largest deals of 2011 were connected with the Swiss companies as targets: medical equipment producer Synthes Holding acquired by Johnson & Johnson and Credit Suisse Group announcing equity fundraiser. German Commerzbank and Italian Unicredit joined the Credit Suisse Group in cash calls. Despite the fact that two largest deals involved Swiss targets, UK remained a leader by both deal value and number, contributing in total value and number by 19.7% and 29.1% respectively. The acquisition of MicroBank de “la Caixa” by Criteria CaixaCorp, both Spanish (13.76 billion USD), resulted in Spain gaining the second place in Western Europe by deal value. The most targeted industries remained the same as in 2010.

For Eastern Europe, M&A activity continued to increase, although to a greater extent in number (12 pp.). The increase in volume was equal to only 0.8 percentage points compared with 2010 (CMS & DealWatch, 2012). The deal sector with the largest number of deals was manufacturing (about 20% of all deals); however, mining was the sector with largest total deal value (almost a third of total deal value for all Eastern European countries). As in the previous years, Russia was the leader in both deal number and deal value – 38% and 65% respectively. Thus, it is not surprising that the largest deal of the year was the acquisition of Russian gold mining company Polyus Gold, with Kazakh gold as the acquirer (CMS & DealWatch, 2012).

2012

The introduction of quotas by multiple countries in 2011 led to increase in share of female directors from 13.6% to 15.8% in 2012 (European Commission, 2013a). Fraction of female chairpersons and CEOs returned to the 2009 value (3%). Therefore, even if quotas encouraged boards to include more women, they were still experiencing double glass ceiling effect – they were not allowed to become leaders of the companies. No legal quotas were introduced in 2012, however, EU members continued to include gender diversity recommendations in Corporate Governance Codes. In particular, the United Kingdom included the recommendation for FTSE 100 companies to increase the fraction of female directors to one-fourth by the end of 2015. The pioneers and the outsiders regarding the fraction of female directors remained the same as in 2010. Romania, Slovakia and Hungary were the countries experiencing the biggest decline in fraction of women on boards (European Commission, 2013a). As a part of Strategy for Equality between Women and Men launched in 2010, European Commission set the goal to increase female representation to 40% for every EU member by 2020.

Despite the growth European M&A market experienced in 2011, 2012 was characterized by decline in both value and number of deals, although the value and the number of deals did not decline to 2010 level (Bureau van Dijk, 2012). The merger between UK miner of metals Xstrata and Glencore operating in commodities industry was the largest deal of the year with the deal value of 33 billion USD. This deal had significantly contributed in the leadership of the UK in the region by deal value – 25.7% of total value. The second and the third deals by value were both conducted in Spanish banking industry with the overall value of almost 39 billion USD. Therefore, it is not surprising that Spain was the second in region by deal value (15.4% of total deal value), as well as the banking industry was the most targeted industry (23.6%).

For Eastern European M&A market, as well for Western European market, the number of deals and their value decreased substantially: in 2012, 40% less deals were conducted,

however, for the deal volume, the loss was not so dramatic – 20.5% (CMS and DealWatch, 2013). Manufacturing remained the most active sector and mining had also remained the leader by deal value, to a significant extent due to the largest Eastern European deal of 2012 – an acquisition of TNK-BP (UK and Russian) by Russian Rosneft, resulting in the deal value of 43 billion EUR. The share of Russian deals in total deal value increased to 82%, however, this increase was due to the increase in average deal value and not in deal number, which grew only by 1 pp. since 2011. Consequently, the reason for the decrease in overall deal volume was the slowdown of Russian economics and clamp down on volatile markets and inflation conducted by Russian Central Bank (CMS and DealWatch, 2013).

2013

In line with the significant improvement in fraction of female directors in 2012, in 2013 the increase constituted 1.2%, making women approximately one of each six directors (European Commission, 2014b). Women were still experiencing difficulties in becoming CEOs or chairpersons: only 2.8% of CEOs and 4.8% of chairpersons were women. Latvia and Slovenia joined the club of countries with more than 20% female representation on boards (European Commission, 2013b). By 2013, Iceland achieved incredible results in board diversity: almost half of the directors sitting in Icelandic boards were women. The biggest decline in number of female directors in 2013 was demonstrated by Romania, Lithuania and Poland.

Three members of the EU introduced government policies to increase gender balance on corporate boards. From April 1, 2013, Danish public companies were obliged to implement gender diversity policies and set goals for female representation, these goals should have been achieved by the end of 2014. The regulation included fines for non-compliance. Polish Corporate Governance Code set an objective for public companies to have at least 30% of women on board by 2015. German policymakers started to prepare the draft of gender quotas law (European Commission, 2014c).

In 2013, Western European M&A market recovered and demonstrated the highest volume in both deal value and number since 2009. The increase in comparison with 2012 was 12% in deal value and 4% in deal number (Bureau van Dijk, 2013). Banking industry continued to dominate in the Western European M&A scene: two largest deals were domestic cash calls for Spanish Bankia worth 13.75 billion USD and Greek National Bank as a crisis measure worth 12.7 billion USD. Third and fourth deals by value were performed in the telecommunication industry – the acquisition of E-Plus Mobilfunk by Telefónica Deutschland and the acquisition of Kabel Deutschland by Vodafone Vierte Verwaltungs resulting in total value of 22.38 billion USD. Although five largest deals of 2013 did not involve UK, UK saved

the leader position by both value and number: 20.6% and 30% respectively. However, since 2008, the value of deals for UK declined by half.

For the Eastern Europe, the number of deals plateaued in comparison with 2011 level, however, the deal value fell by 18.8% (CMS and DealWatch, 2014). Thus, 2013 was marked by increase in deal value for Western Europe and by the opposite for Eastern Europe. The focus for Eastern European M&A shifted from manufacturing to services: 19% of all deals were conducted in this sector. In terms of deal value, mining remained a leader with 20% of overall value of the deals. The largest deal of the year was not connected to the mining: it was a purchase of 30% stake in Russian construction company Stroygasconsulting. Russian share in total M&A deal volume fell to 62% as well as the share in the deal number. Speaking about other remarkable events for Eastern European M&A market, Western European banks had planned to sell their Eastern European subsidiaries: for example, Raiffeisen Bank spoke about selling their Hungarian, Ukrainian and Slovenian businesses (CMS and DealWatch, 2014).

2014

In 2014 for the first time, women represented 20% of all directors making one of the five directors female (European Commission, 2015). The proportion of female CEOs and chairpersons increased as well: 6.5 and 3.3% respectively (European Commission, 2017). What is interesting, European companies were more reluctant to make women CEOs than chairs of the board.

German federal cabinet issued the bill proposing the quota of minimum 30% of female directors for listed companies, which should have been come into force in 2016. The sanction was planned to be declaring void all the non-compliant director appointments. Smaller companies, according to the bill, should disclose their individually set gender equality policies regularly from 2017. Luxembourg also had plans to launch the document requiring public companies to increase the fraction of female directors to 40% by 2019 (European Commission, 2015).

In 2014, Western European M&A market continued to recover from crisis, demonstrating the growth of 24% in terms of deal value. Deal volume decreased by 7.5 pp indicating the increase in individual deal values. The largest deal of the year involved Irish surgical appliances manufacturer Coviden as a target and US medical equipment company Medtronic. The value of the deal was 42.9 billion USD, bringing Ireland on the 8th place measured by deal value (Bureau van Dijk, 2014). Other largest deals included the merger of two cement manufacturers: French Lafarge and Swiss Holcim, acquisition of French Societe Francaise de Radiotelephone by Luxembourgish Altice and the purchase of GlaxoSmithKline's oncology unit by Swiss Novartis. Following UK with 22,5% of total deal

value with an increase by 35% from the previous year, France and Germany took second and third place with 14% and 10% respectively. In the industrial context, other services, banking and machinery remained the most targeted.

Unlike Western Europe growing in both deal volume and value, 2014 was hard for the Eastern Europe in terms of M&A with almost double decrease in value and 15 pp decrease in volume. Such dramatic decrease was a result of introducing western sanctions on Russia following Eastern Ukrainian crisis and the annexing of Crimea. The leaders on deal number and deal value had returned from 2012: manufacturing and mining. Due to sanctions, the share of Russia in overall deal value decreased as well and represented 47%. The biggest deal of the year was conducted in Russia anyway: the purchase of minority stake in RN Holding by Rosneft resulted in the value of over three billion EUR (EMIS, AIG & CMS, 2014).

5. Hypotheses

Previous studies about women in M&A and the influence of managerial overconfidence on M&A performance show that managerial overconfidence is to greater extent an attribute of male directors (Huang & Kisgen, 2013). Studies about the risk aversion of directors of different genders show mixed results, therefore I cannot consider risk aversion as one of the behavioral traits that is particular for one gender and will influence M&A performance in this context. Malmendier & Tate (2008) provided an evidence that managerial overconfidence is one of the value-destroying factors in M&A, In addition to that, board diversity, including board gender diversity, provide alternative views on strategic decisions company plans to make. Although it is harder to negotiate for more diverse boards, diversity results in more effective decision-making (Carter et al., 2003). Taking into account all the arguments provided above, I have an evidence to hypothesize that greater fraction of women on board will result in lower probability of deal failure.

H1: Increase in fraction of women on corporate boards reduces the probability of M&A failure.

6 Data and Methodology

6.1 Data Collection

The data sample consists of the information on finished M&A deals where acquirers are European listed companies. Data sample includes M&A information itself such as effective year, names of both parties involved, country, industry, financial information about the acquirers and the board data. The data was collected from different sources. M&A data as well as financial information about the acquirers and targets was collected from Thomson Reuters database. I included the only the deals with disclosed values in the sample. However, financial information (total assets and EBITDA in particular) about part of the target companies was not available among the data provided by Thomson Reuters, therefore in addition I used Bureau van Dijk Amadeus database. Board data was collected from three sources: BoardEx database, annual reports of acquirer companies available on their websites and Thomson Reuters database. The time period for the observations is from January, 1st, 2008 to December, 31st, 2014. The data sample includes 279 M&A deals with complete information. Deal types included in the sample are merger, acquisition of major interest and acquisition of assets.

6.2 Variables selection

6.2.1 Dependent variable

As the main objective of this thesis is to identify whether the fraction of women on board influences M&A outcome, the response variable represents M&A outcome. It is a dummy variable, which takes the value 0 if the M&A deal succeeded and 1 otherwise and is coded as FAILURE. The proxy of M&A deal outcome is abnormal operating performance and was proposed by Craninckx & Huyghebaert (2011) following Gugler et al. (2003). The main idea behind this indicator is to calculate firm performance, as there have been no M&A and then compare the actual performance after an M&A with the benchmark performance. The benchmark performance is calculated as the sum of the operating performance of the target and the acquirer prior to the deal both multiplied by the change in total assets and operating profitability for the median firm operating in the acquirer or target industry in two years following the deal completion. Gugler et al. (2003) suggest calculating the benchmark performance using the following formula:

$$\pi_{C,t+n} = \pi_{A,t-1} + K_{A,t-1} \frac{K_{I,A,t+n}}{K_{I.A,t-1}} \Delta_{I,A,t-1,t+n} + \pi_{T,t-1} + K_{T,t-1} \frac{K_{I,T,t+n}}{K_{I,T,t-1}} \Delta_{I,T,t-1,t+n} \quad (1)$$

Where

$\pi_{i,n}$ – operating performance of the acquirer or target at the end of year n;

$K_{i,n}$ – total assets of the acquirer or target at the end of year n;

$\Delta_{I,i,n,s}$ = median operating profitability change of the industry I of the firm i between the years n and s.

Change in median operating profitability is calculated as follows:

$$\Delta_{I,i,t-1,t+n} = \frac{\pi_{I,i,t+n}}{K_{I,i,t+n}} - \frac{\pi_{I,i,t-1}}{K_{I,i,t-1}} \quad (2)$$

n is two years following the deal completion. Following Craninckx & Huyghebaert (2011), I used EBITDA as operating performance measure. If the EBITDA of the combined firm following two years after deal closure is less than the benchmark performance, dummy variable takes the value 1, which means deal failure.

6.2.2 Independent variable

Following Levi et al. (2014) I express the independent variable as the fraction of female directors on the board of acquirer company and code it as FRFEM. The fraction of female directors is measured as the number of female directors divided by the overall number of the directors on board. Additional argument in favor of the selection of this independent variable is the fact that the diversity of the acquirer board positively influences post-M&A performance (Bellinger & Hillman, 2000). Moreover, Adams & Ferreira (2009) find that female directors are tougher monitors, which reduces the chances of the board making unreasonably risky decisions and overconfidence issue. According to the research hypothesis, I expect the sign of the regression coefficient to be negative.

6.2.3 Control variables

In order to eliminate the influence of other factors on the regression results, I add control variables associated with M&A failure found in previous literature:

- INDS - Dummy variable for the industry similarity (1 if the acquirer and the target are from the same industry, 0 if not). Collantes & Jimenez (2007) named the knowledge of target industry as a factor increasing the probability of success. My proposal is that if the acquirer and the target are from the same industry, M&A deal is more likely to be successful. Therefore, I hypothesize that the coefficient for this variable will be negative.
- DOMD - Dummy variable for whether the deal is domestic or cross-border (1 if M&A deal is conducted in the same country, 0 if the deal is cross-border). The foundation of this variable, again, comes from Collantes & Jimenes (2007): cultural similarity is an important part of M&A success and if the target and the acquirer come from the same country, they will most likely have cultural similarity. Straub (2007) also named similar cultures of both parties as one of the success factors.
- PREX - Dummy variable for previous experience of M&A (0 if the acquirer has previous M&A experience, 1 if not). According to the study of Gomes et al. (2013), previous experience of the acquirer in M&A increases the probability of success.

- BSIZE - Ln of board size – natural logarithm of the number of directors on board. According to Liu & Wang (2013) and Swanstrom (2006) board size has mixed influence on post-M&A performance depending on the sample, however, in both studies the influence of board size is significant.
- INDD - Fraction of independent directors in the year t-1 - number of independent directors divided by the board size. McDonald et al. (2008) provided an evidence that more directors that are independent is a factor of a successful M&A. In this thesis, independent director is defined as the director who is not employed by the company, independent of the company and its major shareholders. In addition, in the study of corporate accounting scandals, Agrawal & Chadha (2005) suggest that boards with more independent directors are better monitors.
- RSIZE - Relative size - The deal value divided by total assets of the acquiring company in the year t-1. According to Gomes et al. (2013) choosing a target which is either too small or too big will most likely result in underperformance, this is why controlling for relative size is important.

In addition to previously mentioned control variables, I add the measures of size and financial performance used in previous studies of women on board and M&A (Adams & Ferreira, 2009; Levi et al., 2014):

- SIZE - Natural logarithm of total assets of the acquirer in the year t-1 – size measure.
- ROA - ROA of the acquirer in the year t-1 - net income divided by total assets.

To control for the time and industry differences, I add time and industry fixed effects. I used 2-digit NACE industry classification codes as an industry proxy. Those codes were then transformed to the 1-digit codes to avoid excess dummy variables in the regression. The following industries are coded as 1-digit codes:

0 - Agriculture, forestry and fishing, mining and quarrying.
1 – Manufacturing.
2 – Manufacturing.
3 – Manufacturing, electricity, gas, steam and air conditioning supply, water supply; sewerage, waste management and remediation activities.
4 - Construction, wholesale and retail trade; repair of motor vehicles and motorcycles.
5 - Transportation and storage, accommodation and food service activities, information and communication.
6 - Information and communication, financial and insurance activities, real estate and professional activities.
7 - Professional, scientific, administrative, support service and technical activities.

8 - Administrative and support service activities, public administration and defense; compulsory social security, education, human health and social work activities.
9 - Arts, entertainment and recreation, other service activities, activities of households as employers; undifferentiated goods- and services-producing activities of households for own use.

6.3 Variables' selection limitations

The selection of variables is also limited to the availability of the data and the fact that some factors of M&A success of failure are rather difficult to measure. This includes due diligence quality (Straub, 2007), the quality of the integration plan (Venema, 2012), human factor (Cartwright, 2002), etc. It was also not possible to capture the additional board characteristics influencing post-M&A performance, such as the number of boards directors sit on (Ahn et al., 2010) and prior M&A experience of the directors (McDonald et al.,2008) due to missing data and the fact that board data was collected from different sources providing details to the different extent.

6.4 Model selection

In order to examine the influence of female directors on M&A deal outcome, I use binary logistic regression. Binary logistic regression is an optimal choice for this thesis' purpose because of the duality of the response variable and OLS model is not an optimal choice due to the same reason. Scholars already used this method to investigate the effect of women on board on different sides of corporate performance. For instance, Cumming et al. (2015) used binary logistic regression to study the influence of female directors on the probability of corporate fraud. Abbott et al. (2012) used binary logistic regression as a method of examining the influence of the presence of female directors on the probability of financial restatement. Wilson & Altanlar (2009) with the help of logistic regression have established the link between the fraction of female directors and corporate insolvency. I perform binary logistic regression analysis only for the acquirer companies. This choice is determined by the fact that collecting the data about private boards has substantial difficulties when it comes to data availability. The limitation of the binary logistic model is that it requires more data than OLS model, however, the number of observations in the sample is enough to achieve stable results. In addition, I use logit instead if probit because the results of logit regression are easier to interpret.

The logistic regression equation takes the following form:

$$FAILURE = \alpha_0 + \beta_1 \mathrm{FRFEM} + \beta_2 \mathrm{INDS} + \beta_3 \mathrm{DOMD} + \beta_4 \mathrm{PREX} + \beta_5 \mathrm{BSIZE} + \beta_6 \mathrm{INDD} + \beta_7 \mathrm{RSIZE} + \beta_8 \mathrm{SIZE} + \beta_9 \mathrm{ROA} + \varepsilon \quad (3)$$

Before running the logistic regression, I perform univariate tests in order to compare response and control variables between companies without female directors and

companies which have at least one female director and to check the existence of significant differences. To check the robustness of the model, I run the logistic regression, randomly creating different subsamples including different industry categories. For additional robustness check, I use the propensity-score matching technique, which will be more thoroughly explained in the results section.

The reverse causality problem does not apply for this study unlike for the most board studies, because the sample consists of deals and not firm-years as in the majority of board studies. Therefore, it is not possible that the success of the current deal influences the decision to appoint more women on board. In addition, fraction of female directors is lagged in relation to deal outcome. However, the success of prior deals can influence the appointment of more women, but this is not the question of interest in the current study.

6.5 Descriptive statistics

Table 1 represents descriptive statistics of response, predictor and control variables

Table 1. Descriptive statistics of model variables.

Variable	Number of observations	Mean	Standart Deviation	Min	Max
FAILURE	279	0,624	0,485	0	1
FRFEM	279	0,123	0,128	0	0,571
INDS	279	0,462	0,499	0	1
PREX	279	0,100	0,301	0	1
DOMD	279	0,688	0,464	0	1
BSIZE	279	2,136	0,397	1,099	3,367
INDD	279	0,468	0,210	0	1
RSIZE	279	0,160	0,637	0,00	9,931
SIZE	279	13,351	2,293	6,780	19,650
ROA	279	0,036	0,102	-0,665	0,300

The mean fraction of failures is around 62%, which indicates that almost two-third deals in the sample failed to meet the benchmark performance. Mean fraction of female directors in the sample is 12.3%, which is bigger than Adams & Ferreira (2009) and Levi et al. (2014) reported in their studies but lower than the values reported across Europe in 2008-2014. On average, for 46% of the deals in the sample acquirer and target come from the same industry. Only 10% of the acquirers have no experience in M&A. Mean for the domestic deals is about 69%, resulting in more than two-thirds of domestic deals. Average board consists of 9 members, and 46.8% of independent directors. Mean for the relative size indicates that on average, target size is 16% of the size of the acquirer. Average acquirer has 628 million dollars of total assets and has ROA of 3%

Table 2. Distribution of sample by year

Year	Number of deals	Number of failures
2008	41	24
2009	34	20
2010	53	31
2011	47	29
2012	32	22
2013	51	35
2014	21	13
Total	279	174

Table 2 represents the distribution of deals number according to year. The biggest number of deals in the sample occurred in 2010, which contradicts the overall trend for the Western Europe, however, the second biggest number of deals is registered in 2013, which, in turn, is in line with the recovering of M&A market in 2013. The smallest number of deals is registered in 2014. The biggest number of failures in the sample was also in 2013, however it is difficult to say whether this result is in line with the European trend due to the difficulties connected with information retrieval about deal failures across Europe. Small number of deals in 2014 can be explained by the fact that data collection was conducted at the time the majority of companies have just reported their annual results for 2016 (two-year period is necessary for the failure proxy calculation) and these results have not yet appeared in Amadeus.

Table 3. Distribution of sample by country

Acquirer nation	Number of deals
United Kingdom	96
Sweden	34
France	23
Spain	18
Italy	18
Poland	15
Germany	14
Norway	13
Republic of Ireland	9
Belgium	7
Finland	7
Portugal	5
Netherlands	5
Croatia	3
Greece	3
Austria	3
Bulgaria	1
Luxembourg	1
Hungary	1
Iceland	1
Slovak Republic	1
Isle of Man	1
Total	279

According to the Table 3, around one-third of the deals in the sample were performed by the UK acquirers. Substantial number of deals was also made by acquirers from Nordic countries (Sweden and Norway), South European countries (Spain and Italy), Central European Germany and Eastern European Poland.

6.6 Correlations and univariate tests.

Pearson correlation coefficients for response, predictor and control variables are reported in the Table 5. There are high correlation coefficients for two pairs of variables: BSIZE and SIZE, RSIZE and ROA, therefore additional test need to be performed in order to find out if the multicollinearity can be ignored.

To further access the presence of multicollinearity for the predictors of board size, company size, relative size and ROA, I computed variance inflation factors for both pairs of variables. As variance inflation factors do not exceed 2.5 (results of the regressions are presented in the Appendix 1) and both pairs of variables are control variables and not the variables of interest, high correlation between them can be ignored.

In the Table 4, I report the results of the univariate tests between the characteristics of the acquirer companies, which do not have women on board, and those, which have at least one woman.

Table 4. Differences between acquirers with and without women on board
*indicates significance at 5% level

Variable	Mean for the observations without female directors n = 103	Mean for the observations with at least one female director n = 176	Difference
FAILURE	0,709	0,574	-0,135*
BSIZE	1,958	2,240	0,282*
INDD	0,465	0,470	0,004
SIZE	12,481	13,807	1,327*
ROA	0,034	0,051	0,017

According to the Table 4, acquirers with at least one female director have 13.5% lower risk of deal failure. The difference between mean values is significant, which can provide preliminary evidence of Hypothesis 1 confirmation. In addition, firms with at least one female directors have larger boards and are larger in general. The differences in the characteristics can indicate that deal outcome is affected by firm characteristics, which is why controlling for them is important.

Table 5. Correlation between model variables.

	FAILURE	FRFEM	INDS	PREX	DOMD	BSIZE	INDD	RSIZE	SIZE	ROA
FAILURE	1,000									
FRFEM	-0,145	1,000								
INDS	0,023	-0,094	1,000							
PREX	-0,036	0,066	0,025	1,000						
DOMD	-0,012	-0,068	0,050	0,070	1,000					
BSIZE	0,006	0,015	-0,034	-0,156	-0,083	1,000				
INDD	0,012	0,007	-0,019	0,013	-0,062	-0,218	1,000			
RSIZE	-0,001	-0,008	-0,012	0,199	0,076	-0,129	0,119	1,000		
SIZE	0,114	0,095	-0,056	-0,258	-0,122	0,642	-0,078	-0,257	1,000	
ROA	0,034	0,040	0,039	-0,028	-0,104	0,090	-0,029	-0,365	0,216	1,000

7 Results

Table 6 presents the results of binomial logistic regression where response variable is the probability of M&A deal failure and predictor variable is fraction of female directors on board. All columns show that fraction of female directors is negatively and significantly associated with the probability of deal failure. However, in both regressions with industry fixed effects present (columns 2 and 4), significance of fraction of female directors decreases to 5% level.

According to the Table 6, increase in fraction of female directors by one director (approximately 10% of the board) reduces the probability of M&A deal failure by 21,5%. Among other variables, only company size provided to be significant. Thus, bigger acquirers have larger probability of deal failure. This result is consistent with Moeller et al (2005) who find that deals resulting in large losses are performed by bigger acquirers.

The results are robust when taking into account fixed year and industry effects. I did not use firm fixed effects due to insignificantly small fraction of acquirers repeatedly conducting deals in my sample and to avoid the amount of firm dummies, which is too big for the sample and can influence the significance of the results.

Table 6. Binomial logistic regression results

Column 1 presents the results of binomial logistic regression of fraction of female directors on deal outcome without year and industry fixed effects included. Coulmns 2 presents the results of binomial logistic regression with year and industry fixed effects included. Columns 3 and 4 present results with only year and industry fixed effects included respectively. T-statistics for regression coefficients are reported in parentheses. Asterisks indicate significance on 1% (***) and 5% (**) confidence levels.

	Dependent variable: deal failure			
	(1)	(2)	(3)	(4)
FRFEM	-2,686 (-2,671)***	-2,418 (-2,186)**	-2,966 (-2,825)***	-2,176 (-2,045)**
INDS	0,072 (0,281)	-0,025 (-0,090)	0,080 (0,306)	-0,014 (-0,050)
PREX	0,033 (0,075)	-0,229 (-0,482)	0,094 (0,210)	-0,235 (-0,500)
DOMD	-0,044 (-0,156)	0,125 (0,409)	-0,018 (-0,063)	0,112 (0,374)
BSIZE	-0,711 (-1,611)	-0,690 (-1,492)	-0,669 (-1,510)	-0,707 (-1,542)
INDD	-0,046 (-0,073)	0,154 (0,233)	0,071 (0,110)	0,049 (0,076)
RSIZE	0,149 (0,666)	0,082 (0,355)	0,117 (0,517)	0,112 (0,490)
SIZE	0,202 (2,570)**	0,204 (2,400)**	0,191 (2,381)**	0,211 (2,533)**
ROA	0,370 (0,279)	0,248 (0,176)	0,505 (0,374)	0,102 (0,073)
Number of observations	279	279	279	279
R-squared	0,051	0,109	0,059	0,100
Year fixed effects	No	Yes	Yes	No
Industry fixed effects	No	Yes	No	Yes

In order to confirm that nonlinear specification of the model fits the data best, I perform maximum likelihood ratio Wald test. Test statistics is 17.7063, p-value is <0.01, which confirms that logit specification fits the data best.

7.1 Robustness checks

To address potential endogeneity concern specific for board studies, I use propensity-score matching technique, which helps to reduce selection bias in the sample for acquirer characteristics that are already observed. For the control sample selection, probit regression is run, where the response variable is dummy variable for the presence of women on board and predictor variables are ROA and firm size, which, according to the previous studies (i.e. Adams and Ferreira, 2009) significantly influence the fact that women are presented on corporate boards. Then, I match the acquirers with female directors with the acquirers without them on boards according to the propensity of the female directors' presence, creating propensity-score matching subsample. After that, the initial regression linking the deal outcome with the fraction of female directors is run on the created subsample.

Table 7. Propensity-score matching results

Column 1 presents the results of binomial logistic regression of fraction of female directors on deal outcome for the sample created with the help of propensity-score matching. T-statistics for regression coefficients are reported in parentheses. Asterisks indicate significance on 5% (**) and 10% (*) confidence levels.

	Dependent variable: deal failure
	(1)
FRFEM	-3,749
	(-2,249)**
INDS	-0,654
	(-1,507)
PREX	0,170
	(0,240)
DOMD	0,459
	(1,039)
BSIZE	-1,042
	(-1,482)
INDD	-0,240
	(-0,250)
RSIZE	-0,369
	(-0,511)
SIZE	0,207
	(1,405)
ROA	5,834
	(1,768)*
Number of observations	152
R-squared	0,185
Year fixed effects	Yes
Industry fixed effects	Yes

Table 7 presents the results of binomial logistic regression for the subsample created with the help of propensity score matching. Fraction of female directors remains negative and significant, however, acquirer size becomes insignificant and ROA becomes significant instead.

Table 8. Binomial logistic regression results for different industry categories
Column 1 presents the results of binomial logistic regression of fraction of female directors on deal outcome for industry categories 0,1,2,3,4,5,8. Column 2 presents the results of binomial logistic regression for industry categories 6,7 and 9. T-statistics for regression coefficients are reported in parentheses. Asterisks indicate significance on 1% (***), 5% (**) and 10% (*) confidence levels.

	Dependent variable: deal failure	
	(1)	(2)
FRFEM	-3,326 (-2,027)**	-0,903 (-0,402)
INDS	0,769 (1,843)*	-1,378 (-2,721)***
PREX	0,073 (0,117)	-1,037 (-0,979)
DOMD	-0,672 (-1,498)	1,847 (3,067)***
BSIZE	-1,684 (-2,377)**	0,263 (0,349)
INDD	0,748 (0,749)	0,052 (0,046)
RSIZE	0,616 (1,778)*	-1,395 (-1,479)
SIZE	0,445 (2,834)***	0,065 (0,544)
ROA	5,198 (1,550)	-6,012 (-2,010)**
Number of observations	161	118
R-squared	0,225	0,267
Year fixed effects	Yes	Yes
Industry fixed effects	Yes	Yes

For further robustness checks, I randomly created subsamples including different industry categories and exploring the behavior of fraction of female directors when I add or exclude particular industries from the sample. Table 8 presents the results of binomial logistic regression for different industry categories with year and industry fixed effects included. Column 1 represents the regression results for the following industry categories:

- agriculture;
- forestry and fishing;
- mining and quarrying;
- manufacturing;
- electricity, gas;
- steam and air conditioning supply, water supply;
- sewerage, waste management and remediation activities;
- construction;

- wholesale and retail trade; repair of motor vehicles and motorcycles.
- transportation and storage;
- accommodation and food service activities, information and communication;
- administrative and support service activities;
- public administration and defense;
- compulsory social security;
- education;
- human health and social work activities.

For these industry groups, fraction of female directors remains significant. In addition, industry similarity, board size, relative and company size appear to be significant, which can be interpreted in a way that for companies with larger boards, the probability of deal failure decreases as well as if the acquirer and the target are from the same country and, reversely, for bigger companies the probability of deal failure increases as well as for the deals with larger relative size.

Performing the regression on industry groups 6, 7 and 9 (Table 8 column 2) leads to insignificant value of the fraction of female directors. This indicates that for industry groups

- information and communication;
- financial and insurance activities;
- real estate activities;
- professional, scientific and technical activities;
- administrative and support service activities;
- arts, entertainment and recreation;
- other service activities;
- activities of households as employers;
- undifferentiated goods- and services-producing activities of households for own use,

fraction of female directors does not significantly influence the probability of deal failure. Nevertheless, for industry categories 6 and 7, other predictors demonstrate significance. These predictors are industry similarity, domestic deal and ROA.

Taking into account all evidence described below, I can conclude that the influence of fraction of female directors on deal outcome is different for different industries. Unfortunately, it is not possible to run the regression on each industry category separately because of the small number of observations in most categories. This is the reason why I had to consider industries together and combine them to examine which combination results in different behavior of the fraction of female directors.

Conclusions

Board gender diversity is one of the most hotly debated topics in corporate governance studies, which is connected with the overall trend for gender equality including positions of power. Although the small proportion of women on corporate boards started to grow in the last decade due to various government measures and self-regulation, women still represent the minority in boards of directors. An extensive body of studies was conducted to examine how female presence influences different aspects of corporate life: performance, reputation, sustainability, likelihood of unfair manipulation and fraud and takeover policy. This thesis focuses on the last aspect – association of women on board with M&A activities companies undertake.

In the majority of cases, M&A fail to deliver value for the acquirer, which is why the idea to find the association within the board of directors with this fact appeared in a first place. This thesis focuses on the attempt to find the link between female board directors and deal success or failure. Deal failure is a subjective measure and in my study, I focus on the accounting-based failure proxy, which has not been done before in this context. The objective of this thesis was to find out whether the proportion of women on board is associated with deal success and failure and if yes, what is the effect. This thesis focuses mainly on the behavioral context of mergers and acquisitions, on what are the foundations of actions of shareholders and managers, what biases influence decision-making during the M&A process. Overconfidence appears to be one of the most influential and most studied behavioral biases affecting the takeover process and the results. Overconfidence as a behavioral trait more common for male than for female directors, this is why increasing proportion if female directors can help to reduce overconfidence effect. In addition to that, female appear to be tougher monitors than their male colleagues, which, in turn, can also help decision-making free from overconfidence.

The empirical analysis conducted as a part of this study has provided an evidence of significant and negative association between women on board and deal failure. This finding is consistent with the part of women and M&A studies stating that acquirers with women on board pay lesser bid premium and therefore experience overconfidence-related overpayment to lesser extent. The results, however, do not hold for all considered industries included in the analysis to account for industry-specific effect, which could be omitted otherwise. For the industry categories information and communication, financial and insurance activities, real estate activities, professional, scientific and technical activities, administrative and support service activities, arts, entertainment, recreation, and other service activities, fraction of female directors does not influence deal failure.

This thesis contributes to the existing body of literature about female directors and M&A in various ways. First, this thesis provides an empirical evidence of how the proportion of women on board is associated with the deal outcome, which has not been published before as well as measuring post-takeover performance in connection with women on board by binary outcome. Second, accounting-based outcome measure is used, unlike in other studies measuring post-takeover performance using market indicators. Third, this thesis adds to the already published studies regarding women on board and M&A including the European context. Fourth, the study finds that the influence is industry-specific, which may be further examined in the future.

Nevertheless, the results of this study do not provide direct recommendation to include more women on board as a key to the successful deal and should be interpreted with caution, taking into account numerous limitations. The first limitation of this study is a sample size. Even with all the instruments provided by the University, finding pieces of information from different sources and matching them was difficult and time-consuming. In particular, Russian deals are not present in the sample, as for none of the targets the information of EBITDA value was not available, leading to the study missing the observations for most influential Eastern European country in terms of M&A. The sample obtained for the thesis does not reflect the European trend of introducing more women on boards through the years of analysis and only partly reflects trends in M&A activity; this is why poor generalizability of the results is another limitation of this study.

Continuing with the data availability limitations, one of the failure proxies suggested by Craninckx & Huyghebaert (2011) was the divestment of more than a half of the stake by the acquirer in two years following deal completion. This proxy was not applicable for my thesis because only one acquirer from the sample have made the described divestment. Previous literature determined an extensive number of reasons for the deal failure; however, not all of them were included in the study because of the data availability problem. Some of these predictors require information available only for the internal use; others come from the resources, which are not available. Therefore, even after controlling for year and industry omitted variables, the possibility for omitted variables problem for this thesis is substantial. The omitted variable problem applies also to the personal characteristics of directors: age, education, experience, number of boards the directors sits in, network size. All these characteristics should be considered together with gender; however, again, the availability of this data would limit the sample to the extent where planned analysis is not possible.

In addition, this thesis is subject to the problem of studies with binary predictable variables. As there are only two outcomes, it is not possible to measure the magnitude of deal failure or success. Moreover, the industry differences captured in the sample regarding the influence of the proportion of women on board on deal outcome are difficult to interpret due

to several reasons. First, the sample size for some industry categories included only several observations; this is why it was not possible to consider them individually. Second, the precise data regarding the gender composition of each industry in each country was unavailable and it was possible to operate only with the approximate data for the EU (not all Europe), which provided to be unrelated to the picture drawn by sample analysis (the results are not included in the study). The same notion applies for the gender composition of boards in different industries during the analyzed time.

All described limitations present a wide range of possibilities for future research. Gathering more data and extending the analyzed sample would improve the confidence of the analysis and improve its generalizability. More focused research, for example, on individual European countries or other regions with probably different dynamics of board composition, would extend the evidence provided by this study. Another extension of this thesis could be adding legal perspective to the picture and studying, how legal systems (e.g. common, civil and Scandinavian law) influence the relationship between women on board and M&A outcome. I would also suggest focusing on industry differences of the connection between women on board and M&A outcome: understanding industry gender composition, patterns and special features of M&A could help in understanding the reasons for these differences. Moreover, considering the gender of the directors together with their other personal characteristics as well as more board characteristics (in this thesis only board size and independence were considered) will help to draw a clearer picture. I would like to suggest focusing on a critical mass theory and its applicability to the studied topic as well: does simple female presence is negatively associated with the deal failure or does it become stronger or more significant when female directors reach the critical mass threshold?

Overconfidence and risk aversion, as was already mentioned, are the most studied biases in context of directors and executives gender. However, other biases such as confirmation bias, hindsight bias, and escalation of commitment are also present in M&A and influence their results. The problem here is that designing proxies for capturing those biases is difficult. This difficulty, however, can be a challenge for further research; consequently, design of these proxies, testing them in relation to directors of different gender and including in the analysis is, indeed, extremely challenging but also interesting research extension. Last extension I would like to mention is studying how the previous history of successful or unsuccessful mergers and acquisitions influence the decision of the company to hire more women as directors.

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Appendices

Appendix 1. Results of the multivariate OLS regressions used for VIF computing

Dependent variable: BSIZE	Estimate	tStat	pValue
FRFEM	-0,143	-0,998	0,319
INDS	-0,001	-0,034	0,973
PREX	0,013	0,205	0,837
DOMD	-0,022	-0,555	0,579
INDD	-0,332	-3,833	0,000
RSIZE	0,028	0,884	0,378
SIZE	0,109	13,265	0,000
ROA	-0,154	-0,801	0,424
Number of observations	279		
R-squared	0,447		

Dependent variable: SIZE	Estimate	tStat	pValue
FRFEM	1,562	1,911	0,057
INDS	-0,129	-0,621	0,535
PREX	-1,114	-3,132	0,002
DOMD	-0,154	-0,679	0,498
BSIZE	3,613	13,265	0,000
INDD	0,795	1,560	0,120
RSIZE	-0,429	-2,392	0,017
ROA	2,598	2,366	0,019
Number of observations	279		
R-squared	0,486		

Dependent Variable: RSIZE	Estimate	tStat	pValue
FRFEM	0,053	0,191	0,849
INDS	-0,011	-0,160	0,873
PREX	0,318	2,653	0,008
DOMD	0,032	0,418	0,676
BSIZE	0,104	0,884	0,378
INDD	0,332	1,946	0,053
SIZE	-0,048	-2,392	0,017
ROA	-2,017	-5,733	0,000
Number of observations	279		
R-squared	0,200		

Dependent variable: ROA	Estimate	tStat	pValue
FRFEM	0,012	0,274	0,784
INDS	0,009	0,825	0,410
PREX	0,027	1,351	0,178
DOMD	-0,015	-1,191	0,235
BSIZE	-0,015	-0,801	0,424
INDD	0,004	0,134	0,893
RSIZE	-0,054	-5,733	0,000
SIZE	0,008	2,366	0,019
Number of observations	279,000		
R-squared	0,164		

Appendix 2. List of deals

Target Name	Acquiror Name	Acquiror Industry (NACE, 2-digit)	Acquiror Nation	Target Nation	Effective Year
Ned-Deck Marine BV {NDM}	Palfinger AG	25	Austria	Netherlands	2010
Varioform PET Verpackung GmbH	UIAG	64	Austria	Austria	2008
STEINZEUG Abwassersysteme GmbH	Wienerberger AG	23	Austria	Germany	2011
Biofirst SA	Floridienne NV	20	Belgium	Belgium	2011
Argenta Discovery 2009 Ltd	Galapagos NV	72	Belgium	United Kingdom	2010
FIMI Srl	Barco NV	27	Belgium	Italy	2010
Groep Terryn NV	CFE	41	Belgium	Belgium	2010
Rigby & Peller Ltd	Van De Velde NV	46	Belgium	United Kingdom	2011
Vidalia SARL	Rentabiliweb Group SA	63	Belgium	France	2010
Tactem SAS	Econocom Group SA	77	Belgium	France	2012
St St Constantine & Helena Holding JSC	Holding Varna AD	64	Bulgaria	Bulgaria	2009
Istraturist dd	Plava Laguna dd	55	Croatia	Croatia	2014
Droga Kolinska	Atlantic Grupa dd	10	Croatia	Slovenia	2010
COMBIS doo	Hrvatski Telekom dd	61	Croatia	Croatia	2010
Kopijyva Oy	Panostaja Oyj	64	Finland	Finland	2008
Caternet Finland Oy	Lannen Tehtaat Oyj	10	Finland	Finland	2012
Hamworthy PLC	Wartsila Oyj Abp	28	Finland	United Kingdom	2012
Brain Alliance Oy	Soprano Oyj	62	Finland	Finland	2009
KotiSun Oy	Panostaja Oyj	64	Finland	Finland	2014
Talentum Oyj	Alma Media Oyj	58	Finland	Finland	2009
BCP Fluted Packaging Ltd	Huhtamaki Oyj	17	Finland	United Kingdom	2013
Natraceutical Industrial SL	Naturex SA	20	France	Spain	2013
Serimax SAS	Vallourec SA	24	France	France	2010
Ginkoia	DL Software SA	58	France	France	2009
Juxta SA	DL Software SA	58	France	France	2010
Conseils et Informatique de la Metropole SA	DL Software SA	58	France	France	2010
Dessange International SA	OFI Private Equity Capital SA (Eurazeo PME Capital SAS)	64	France	France	2008
Fondis Electronic	OFI Private Equity Capital SA (Eurazeo PME Capital SAS)	64	France	France	2008
Digitick SA	Vivendi SA	59	France	France	2010

Groupe Helice SAS	Umanis SA	62	France	France	2013
Fonciere Sepric SA	Patrimoine et Commerce SA	68	France	France	2012
Prosodie SA	Capgemini Service SAS	70	France	France	2011
Prosernat SA	Heurtey Petrochem SA	71	France	France	2011
Bruichladdich Distillery Co Ltd	Remy Cointreau SA	11	France	United Kingdom	2012
Tonnellerie Berger & Fils SAS	Tonnellerie Francois Freres SA	16	France	France	2014
Suez SA	Gaz de France SA	35	France	France	2008
Ocito SAS	1000Mercis SA	63	France	France	2008
Fonciere Developpement Logements SA{FDL}	Fonciere des Regions SA	68	France	France	2013
Syntaxin Ltd	Ipsen SA	72	France	United Kingdom	2013
Loro Piana SpA	LVMH Moet Hennessy Louis	11	France	Italy	2013
LeGuide.com SA	Lagardere SCA	58	France	France	2012
OneFit Medical SAS	EOS Imaging SA	26	France	France	2013
Yachts de Paris	Sodexo SA	56	France	France	2008
Lenotre SA	Sodexo SA	56	France	France	2011
Ensus Ltd	CropEnergies AG	20	Germany	United Kingdom	2013
otris software AG	Easy Software AG	62	Germany	Germany	2010
GSW Immobilien AG	Deutsche Wohnen AG	68	Germany	Germany	2013
TicketOne SpA	CTS Eventim AG	79	Germany	Italy	2010
MAN SE	Volkswagen AG	29	Germany	Germany	2011
EIA Electronics NV	Grammer AG	31	Germany	Belgium	2011
Bohnhorst Agrarhandel GmbH	BayWa AG	46	Germany	Germany	2013
Webassets BV	TOMORROW FOCUS AG	63	Germany	Netherlands	2012
nuclitec GmbH	Eckert & Ziegler Strahlen- und	72	Germany	Germany	2009
Laboratoria Flandria NV	Celesio AG	21	Germany	Belgium	2009
on line Datensysteme GmbH	CANCOM SE	70	Germany	Germany	2013
Pironet NDH AG	CANCOM SE	70	Germany	Germany	2014
Acciai Speciali Terni SpA	ThyssenKrupp AG	24	Germany	Italy	2014
GK Software AG	SAP AG	62	Germany	Germany	2013
Anoxal SA	Elval Hellenic Aluminium	24	Greece	Greece	2009
Open Technology Services SA	ALTEC Holding SA Information	62	Greece	Greece	2011
AKEP SA	Newsphone	61	Greece	Greece	2009
Modultechnika Kereskedelmi es Szolgaltato Kft	Magyar Telekom Nyrt	61	Hungary	Hungary	2010

TeamOlmed Nord AB	Ossur HF	32	Iceland	Sweden	2013
Mobenga AB	Playtech PLC	62	Isle of Man	Sweden	2011
Huta Szkla Czechy SA	Zignago Vetro SpA	23	Italy	Poland	2011
elero GmbH	Nice SpA	27	Italy	Germany	2011
ASPEM SpA	A2A SpA	35	Italy	Italy	2008
Global Marine Systems Energy Ltd	Prysmian SpA	46	Italy	United Kingdom	2012
Newton Management Innovation SpA	Il Sole 24 ORE SpA	58	Italy	Italy	2008
4G Retail Srl	Telecom Italia SpA	61	Italy	Italy	2011
EI Towers SpA	DMT SpA	61	Italy	Italy	2012
Silentron SpA	Nice SpA	27	Italy	Italy	2008
Mirabello SpA	Caleffi SpA	28	Italy	Italy	2008
Naturapack Srl	Industria Macchine Automatiche	28	Italy	Italy	2010
Emmegas Srl	Landi Renzo SpA	29	Italy	Italy	2013
Energia Alternativa Srl	TerniEnergia SpA	43	Italy	Italy	2013
Multiopticas Internacional SL	Luxottica Group SpA	46	Italy	Spain	2011
Dada SpA	RCS MediaGroup SpA	58	Italy	Italy	2008
Dada SpA	RCS MediaGroup SpA	58	Italy	Italy	2010
Lovato Gas SpA	Landi Renzo SpA	29	Italy	Italy	2008
Southlands Srl	CIR SpA	70	Italy	Italy	2013
Celly SpA	Esprinet SpA	46	Italy	Italy	2014
Alpha Media SA	RTL Group SA	60	Luxembourg	Greece	2008
Sensor-Nite NV	Sensata Tech Hldg NV	27	Netherlands	Belgium	2011
Cinterion Wireless Modules GmbH	Gemalto NV	58	Netherlands	Germany	2010
ICT Automatisering NV	DPA Group NV	82	Netherlands	Netherlands	2013
Life RF doo	Cryo-Save Group NV	86	Netherlands	Serbia	2011
Gasnor AS	Royal Dutch Shell PLC	6	Netherlands	Norway	2012
Brookside Products Ltd	Morpol ASA	3	Norway	United Kingdom	2010
Leroy Seafood Group ASA	Austevoll Seafood ASA	3	Norway	Norway	2008
Hordafor AS	Austevoll Seafood ASA	3	Norway	Norway	2011
Keliber Oy	Nordic Mining ASA	7	Norway	Finland	2008
Plastsveis AS	AKVA Group ASA	33	Norway	Norway	2013
Miljobase Vats AS	AF Gruppen ASA	42	Norway	Norway	2014

Stingray Geophysical Ltd	TGS-NOPEC Geophysical Co ASA	71	Norway	United Kingdom	2011
Powel ASA	Arendals Fossekompani ASA	35	Norway	Norway	2009
Glamox ASA	Arendals Fossekompani ASA	35	Norway	Norway	2012
Imento Norge AS	Atea ASA	46	Norway	Norway	2014
Axcess A/S	Atea ASA	46	Norway	Denmark	2014
Aspiro AB	Schibsted ASA	58	Norway	Sweden	2012
Stavanger Aftenblad ASA	Schibsted ASA	58	Norway	Norway	2008
'Kartpol Group Sp zoo	Suwary SA	22	Poland	Poland	2010
Rabat Service SA	Bomi SA	47	Poland	Poland	2008
Rottneros AB	Arctic Paper SA	17	Poland	Sweden	2013
THEYSOHN Formenbau GmbH	Boryszew SA	20	Poland	Germany	2011
KBP Kettenwerk Becker-Pruente GmbH	Grupa Kapitalowa Fasing SA	25	Poland	Germany	2008
Przedsiebiorstwo Robot Inzynieryjnych Budownictwa Sp zoo	ABM Solid SA	41	Poland	Poland	2010
Scop Computers SRL	ABC Data SA	46	Poland	Romania	2010
Frog MS Delko Sp zoo	Delko SA	46	Poland	Poland	2010
Invia.cz 79	MCI Management SA	64	Poland	Czech Republic	2008
MW Trade SA	Getin Holding SA	64	Poland	Poland	2010
Agencja Wydawniczo-Reklamowa Wprost Sp zoo	Platforma Mediowa Point Group	73	Poland	Poland	2009
NOVITA SA	Zaklady Lentex SA	23	Poland	Poland	2014
e-Muzyka SA	NFI Empik Media & Fashion SA	47	Poland	Poland	2011
Stream Communications Sp zoo	Hyperion SA	61	Poland	Poland	2010
eCard SA	Towarzystwo Finansowe SKOK SA	64	Poland	Poland	2009
OGIMATECH Portugal-Consultoria Empresarial e Institucional SA	Reditus SGPS SA	70	Portugal	Portugal	2010
Hidroelectrica del Cantabrico SA	EDP Energias de Portugal SA	35	Portugal	Spain	2013
Sonaecom SGPS SA	Sonae SGPS SA	64	Portugal	Portugal	2013
InfoPortugal SA	Impresa SGPS SA	70	Portugal	Portugal	2010
Setgas Sociedade de Distribuicao de Gas Natural SA	Galp Energia SGPS SA	70	Portugal	Portugal	2012
'Binari Sonori Srl	Keywords Studios PLC	18	Republic of Ireland	Italy	2014

Rigby Taylor Ltd	Origin Enterprises PLC	46	Republic of Ireland	United Kingdom	2011
United Agri Products Ltd	Origin Enterprises PLC	46	Republic of Ireland	United Kingdom	2011
James Hay Holdings Ltd	IFG Group PLC	66	Republic of Ireland	United Kingdom	2010
Fiomi Diagnostics AB 26	Trinity Biotech PLC	82	Republic of Ireland	Sweden	2012
Frankort & Koning BV	Total Produce Plc	46	Republic of Ireland	Netherlands	2012
BP Gas Nederland BV	DCC PLC	70	Republic of Ireland	Netherlands	2012
Swea Energi Holding AB	DCC PLC	70	Republic of Ireland	Sweden	2012
Southern Cement Ltd	CRH PLC	23	Republic of Ireland	United Kingdom	2013
Statlogics Zrt	Asseco Slovakia AS	58	Slovak Republic	Hungary	2010
Spicers Ltd	Unipapel SA (Adveo)	17	Spain	United Kingdom	2011
Medgaz SA	Gas Natural SDG SA	35	Spain	Spain	2013
Coffetek Ltd	Azkoyen SA	46	Spain	United Kingdom	2008
Tuenti Technologies SL	Telefonica SA	61	Spain	Spain	2013
Tuenti Technologies SL	Telefonica SA	61	Spain	Spain	2010
Mecalux SA	Corporacion Financiera Alba SA	64	Spain	Spain	2013
Progenika Biopharma SA	Grifols SA	69	Spain	Spain	2013
Funeraria Pedrola SL	Funespana SA	96	Spain	Spain	2010
Funbierzo SL	Funespana SA	96	Spain	Spain	2010
Servicios y Gestion Funeraria SA{Segyresa}	Funespana SA	96	Spain	Spain	2011
Riso Scotti SpA	Ebro Foods SA	10	Spain	Italy	2013
DS Smith Packaging Atlantique SASU	Europac	17	Spain	France	2013
Abertis Infraestructuras SA	OHL	42	Spain	Spain	2013
Schlecker SA	DIA SA	47	Spain	Spain	2013
Lavinia Tec Com SL	Vertice Trescientos Sesenta	59	Spain	Spain	2010
Exis Inversiones en Consultoria Informatica y Tecnologia SA	Altia Consultores SA	62	Spain	Spain	2013
Funerarias Reunidas del Bierzo SA	Funespana SA	96	Spain	Spain	2013
Praga Louny CZ as	CIE Automotive SA	64	Spain	Czech Republic	2008
MIP Technologies AB	Biotage AB	20	Sweden	Sweden	2010
Advanced Inertial Measurement Systems Sweden AB	C2SAT Holding AB	26	Sweden	Sweden	2011
Servage AB	Getupdated Internet Marketing	63	Sweden	Sweden	2013
Nilorngruppen AB	AB Traction	64	Sweden	Sweden	2009

Nexa Trading AB	OEM International AB	70	Sweden	Sweden	2014
Cortus AB	Clean Tech East Holding AB	20	Sweden	Sweden	2013
Proximion AB	Hexatronic Scandinavia AB	26	Sweden	Sweden	2014
Svenska Vindbolaget AB	Eolus Vind AB	42	Sweden	Sweden	2011
Swedish Orphan International AB	Biovitrum AB	46	Sweden	Sweden	2010
Hemtex AB	Hakon Invest AB	64	Sweden	Sweden	2009
Diab Group AB	Ratos AB	64	Sweden	Sweden	2009
Peab Industri AB	Peab AB	70	Sweden	Sweden	2009
LICOS Trucktec GmbH	Concentric AB	70	Sweden	Germany	2013
BioPhausia AB	Medivir AB	72	Sweden	Sweden	2011
Varldens Resor AB	Unlimited Travel Group AB	79	Sweden	Sweden	2008
Stockholm Gastro Center AB	Global Health Partner AB	86	Sweden	Sweden	2010
LTS Licht & Leuchten GmbH	Fagerhult AB	27	Sweden	Germany	2010
Designplan Lighting Ltd	Fagerhult AB	27	Sweden	United Kingdom	2011
Tretti AB	CDON Group AB	47	Sweden	Sweden	2011
Acute FDS Oy	Vitec Software Group AB	58	Sweden	Finland	2014
Biolin Scientific AB	Ratos AB	64	Sweden	Sweden	2011
KVD Kvarndammen AB	Ratos AB	64	Sweden	Sweden	2011
Ledil Oy	Ratos AB	64	Sweden	Finland	2013
Hent AS	Ratos AB	64	Sweden	Norway	2013
Hil-Anders Advertising Agency AB	Intellecta AB	70	Sweden	Sweden	2008
Handitek AB	MedCap AB	70	Sweden	Sweden	2009
Cardo AB	Assa Abloy AB	70	Sweden	Sweden	2011
Medav GmbH	Saab AB	30	Sweden	Germany	2012
Oreo AB	Eniro AB	70	Sweden	Sweden	2009
Mercados Energy Markets International SA	AF AB	70	Sweden	Spain	2010
CityPlan spol sro	AF AB	70	Sweden	Czech Republic	2011
Advansia AS	AF AB	70	Sweden	Norway	2012
River Cresco AB	Intellecta AB	70	Sweden	Sweden	2013
Tehnomobil doo	Securitas AB	70	Sweden	Croatia	2013
Scotvalve Services Ltd	Petrofac Ltd	6	United Kingdom	United Kingdom	2010
PR Singleton Ltd	IGas Energy PLC	6	United Kingdom	United Kingdom	2013
Wrekin Grain Ltd	Wynnstay Group PLC	10	United Kingdom	United Kingdom	2011
Evesons Fuels Ltd	NWF Group PLC	10	United Kingdom	United Kingdom	2011
Rubicon Drinks Ltd	AG Barr PLC	11	United Kingdom	United Kingdom	2008
Absolute Intuistic Ltd	Communisis PLC	18	United Kingdom	United Kingdom	2008

Kieon Ltd	Communisis PLC	18	United Kingdom	United Kingdom	2012
Joseph Metcalf Ltd	William Sinclair Holdings PLC	20	United Kingdom	United Kingdom	2008
PolymerLatex GmbH & Co KG	Yule Catto & Co PLC	20	United Kingdom	Germany	2011
Palagan Ltd	Plastics Capital PLC	22	United Kingdom	United Kingdom	2008
Freshfield Lane Brickworks Ltd	Michelmersh Brick Holdings PLC	23	United Kingdom	United Kingdom	2010
Argillon GmbH	Johnson Matthey PLC	24	United Kingdom	Germany	2008
Al-Met Ltd	Pressure Technologies PLC	25	United Kingdom	United Kingdom	2010
LDS Test & Measurement Ltd	Spectris PLC	26	United Kingdom	United Kingdom	2008
Global Digital Systems Ltd	Judges Scientific PLC	26	United Kingdom	United Kingdom	2012
Spanoptic Ltd	Gooch & Housego PLC	26	United Kingdom	United Kingdom	2013
Elektrobit System Test Oy	Anite PLC	26	United Kingdom	Finland	2013
ServiceSource Europe Ltd	Acal PLC	27	United Kingdom	United Kingdom	2009
Hectronic AB	Acal PLC	27	United Kingdom	Sweden	2011
Frontier Silicon Ltd	Toumaz Ltd	27	United Kingdom	United Kingdom	2012
Energy Information Centre Ltd	Utilitywise Plc	35	United Kingdom	United Kingdom	2013
Dean & Dyball Ltd	Balfour Beatty PLC	41	United Kingdom	United Kingdom	2008
Hedra PLC	Mouchel Group PLC	41	United Kingdom	United Kingdom	2008
Hillreed Homes Ltd	Persimmon PLC	41	United Kingdom	United Kingdom	2012
Promanex Group Ltd	Costain Group PLC	42	United Kingdom	United Kingdom	2011
3C Asset Management Ltd	Mears Group PLC	43	United Kingdom	United Kingdom	2009
York Linings International Ltd	Cape PLC	43	United Kingdom	United Kingdom	2011
LABELJET Comercio e Industria de Etiquetas SA	Domino Printing Sciences PLC	46	United Kingdom	Portugal	2009
Chausport SA	JD Sports Fashion PLC	47	United Kingdom	France	2009
London Southend Airport Ltd	Stobart Group Ltd	49	United Kingdom	United Kingdom	2008
ELI-Transport GmbH	Wincanton PLC	49	United Kingdom	Germany	2008
Harrow Green Ltd	Restore PLC	49	United Kingdom	United Kingdom	2012
MB Faber Ltd	James Fisher & Sons PLC	50	United Kingdom	United Kingdom	2009
Geronimo Inns Ltd	Young & Co's Brewery PLC	56	United Kingdom	United Kingdom	2010
Frances Lincoln Ltd	The Quarto Group Inc	58	United Kingdom	United Kingdom	2011

Trisent Communications Ltd	Artilium PLC	61	United Kingdom	United Kingdom	2008
Rx Systems Ltd	EMIS Group PLC	62	United Kingdom	United Kingdom	2010
Xchanging Broking Services Ltd	Xchanging PLC	62	United Kingdom	United Kingdom	2011
Plumtree Group Ltd	Ideagen Plc	62	United Kingdom	United Kingdom	2012
IT-Freedom Ltd	Quindell Portfolio PLC 6201 (Watchstone Group PLC)	62	United Kingdom	United Kingdom	2012
TFPL Ltd	ILX Group PLC	62	United Kingdom	United Kingdom	2013
Gael Ltd	Ideagen Plc	62	United Kingdom	United Kingdom	2014
Cavendish Young Ltd	Merchant Securities PLC	64	United Kingdom	United Kingdom	2009
Therium Capital Management Ltd	City of London Group PLC	64	United Kingdom	United Kingdom	2010
Politics International Ltd	Hasgrove PLC	70	United Kingdom	United Kingdom	2008
Co-Tek(South West)Ltd	Omega Diagnostics Group PLC	70	United Kingdom	United Kingdom	2009
Production Services Network (UK)Ltd	John Wood Group PLC	70	United Kingdom	United Kingdom	2011
Business Employment Services Training Ltd	Interserve PLC	70	United Kingdom	United Kingdom	2012
Eddisons Commercial Ltd	Begbies Traynor Group PLC	70	United Kingdom	United Kingdom	2014
Zirkon Ltd	Stadium Group PLC	71	United Kingdom	United Kingdom	2008
Mash Health Ltd	Cello Group PLC	73	United Kingdom	United Kingdom	2013
Longmoor Services Ltd	Westminster Group PLC	80	United Kingdom	United Kingdom	2009
Tisys SA	Ultra Electronics Holdings PLC	84	United Kingdom	France	2009
Giga Communications Ltd	Ultra Electronics Holdings PLC	84	United Kingdom	United Kingdom	2012
Fruite Entreprises SA	Britvic PLC	11	United Kingdom	France	2010
The Health Hive Group Ltd	St Ives PLC	18	United Kingdom	United Kingdom	2014
Formox AB	Johnson Matthey PLC	24	United Kingdom	Sweden	2013
Th Jansen Armaturen GmbH	IMI PLC	28	United Kingdom	Germany	2011
Remosa SpA	IMI PLC	28	United Kingdom	Italy	2012
Slough Heat & Power Ltd	Scottish & Southern Energy PLC	35	United Kingdom	United Kingdom	2008
Haven Power Ltd	Drax Group PLC	35	United Kingdom	United Kingdom	2009
'Jackson Lloyd Ltd	Mears Group PLC	43	United Kingdom	United Kingdom	2010
Lay & Wheeler Ltd	Majestic Wine PLC	47	United Kingdom	United Kingdom	2009

Toolstation Ltd	Travis Perkins PLC	47	United Kingdom	United Kingdom	2012
Plymouth Citybus Ltd 49	The Go-Ahead Group PLC	49	United Kingdom	United Kingdom	2009
British Midland Airways Ltd	Intl Consolidated Airlines Grp	51	United Kingdom	United Kingdom	2012
Axell Wireless Ltd	Cobham PLC	61	United Kingdom	United Kingdom	2013
Mobilethink A/S	Spirent Communications PLC	61	United Kingdom	Denmark	2014
Star-Apic SA	1Spatial PLC	62	United Kingdom	Belgium	2013
Inspection Services(UK)Ltd	PHSC PLC	70	United Kingdom	United Kingdom	2008
ABS Network Solutions Ltd	The Capita Group PLC	70	United Kingdom	United Kingdom	2008
Metoc PLC	Intertek Group PLC	71	United Kingdom	United Kingdom	2010
MediaVest(Manchester)Ltd	Aegis Group PLC	73	United Kingdom	United Kingdom	2011
SDLC Solutions Ltd	NCC Group PLC	74	United Kingdom	United Kingdom	2010
Devil Fish Poker Ltd	Weather Lottery PLC	92	United Kingdom	United Kingdom	2010
3d-Radar AS	Chemring Group PLC	20	United Kingdom	Norway	2014
Powerminster Gleeson Services	Morgan Sindall Group PLC	41	United Kingdom	United Kingdom	2010
DG Robson Mechanical Services Ltd	T Clarke PLC	43	United Kingdom	United Kingdom	2010
Flower World	Wm Morrison Supermarkets PLC	47	United Kingdom	United Kingdom	2011
Ufindus Ltd	BT Group PLC	61	United Kingdom	United Kingdom	2008
Leasedirect Finance Ltd	Investec PLC	64	United Kingdom	United Kingdom	2010
Capmark Services Ireland Ltd	The Capita Group PLC	70	United Kingdom	Republic of Ireland	2009
CHKS Ltd	The Capita Group PLC	70	United Kingdom	United Kingdom	2009
Carillion IT Services Ltd	The Capita Group PLC	70	United Kingdom	United Kingdom	2009
Performance Improvements(PI) Ltd	AMEC PLC	70	United Kingdom	United Kingdom	2009
SunGard Public Sector Ltd	The Capita Group PLC	70	United Kingdom	United Kingdom	2010
Premier Medical Group Ltd	The Capita Group PLC	70	United Kingdom	United Kingdom	2010
Team24 Ltd	The Capita Group PLC 70	70	United Kingdom	United Kingdom	2011
Club 24 Ltd	The Capita Group PLC	70	United Kingdom	United Kingdom	2011
Salmobreed AS	Benchmark Holdings PLC	70	United Kingdom	Norway	2014
FortConsult A/S	NCC Group PLC	74	United Kingdom	Denmark	2014
Creativevents Ltd	MITIE Group PLC	86	United Kingdom	United Kingdom	2012

ParkingEye Ltd	Capita PLC	70	United Kingdom	United Kingdom	2013
Northgate Managed Services Ltd	Capita PLC	70	United Kingdom	United Kingdom	2013
Dalkia Energy & Technical Services Ltd	MITIE Group PLC	86	United Kingdom	United Kingdom	2009
Giraffe Concepts Ltd	Tesco PLC	47	United Kingdom	United Kingdom	2013