Board Gender Diversity, Gender Quota Laws and M&A Performances

An event study on European M&A Deals

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Abstract

The fact that mergers and acquisitions are often rather value-destroying than value-enhancing is often attributed to the male dominance on corporate boards. The striking gender imbalance on corporate boards has led to the implementation of gender quota laws in several European countries. This study examines the impact of board gender diversity on M&A performances of listed European acquirers. An event study is performed to obtain the cumulative abnormal returns from 2,579 firms that were involved in a total of 14,982 M&A deals from 2003 to 2018. The results indicate that there is no significant relationship between board gender diversity and M&A performances. Furthermore, it is found that the presence of at least three female directors on the acquiring board does not significantly impact the M&A performances. Finally, it is found that the effect of board gender diversity on M&A performances is significantly stronger in countries with a binding gender quota law.

Keywords: mergers and acquisitions, gender diversity, board of directors, abnormal returns, gender quota laws

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1. Introduction

Over the past few decades, an increasing number of countries have introduced gender quota laws for corporate boards, requiring firms to include a certain percentage of women on their boards. The movement towards gender equality in organizations is accompanied by a growing body of literature on the role of women in decision-making positions. Previous research has shown significant differences in the way women behave compared to men, especially in uncertain settings (Barber & Odean, 2001; Byrnes et al., 1999). Mergers and acquisitions (M&As) offer one example of a corporate setting in which there's a lot of uncertainty and complexity. M&As are important strategies for firms seeking corporate growth. By reallocating corporate control, M&As play an important role in channeling corporate assets in the most efficient way. However, research has shown that many M&As actually fail to enhance the shareholder value of the acquirer (Andrade et al., 2001; Levi et al., 2011). An important reason for this finding is managerial overconfidence, a typically masculine trait (Barber & Odean, 2001). Considering both the importance of M&As and the behavioral differences between men and women in corporate settings, it is interesting to take a closer look at the effect of gender on the success of M&As.

The high rate of unsuccessful M&As is often attributed to managerial overconfidence (Malmendier & Tate, 2008). Overconfident managers tend to overestimate both the future value of their investment projects and their ability to select profitable investments. Consequently, they overinvest, which often results in value-destroying M&As. In general, women tend to be less overconfident than men (Barber & Odean, 2001). Therefore, one would expect women to make more rational decisions regarding M&A opportunities. The board of directors is an important decision-making body for firms. Boards play a crucial role in the M&A process since their approval is required for the deal to proceed (Levi et al., 2014). Moreover, the board is responsible for constraining managerial opportunism, ensuring that the firm acts in the best interest of its shareholders. The extent to which a board is able to perform these tasks depends on its composition (Carter et al., 2010). It is argued that board gender diversity affects the board's monitoring ability and thereby its commitment to protecting the shareholder interests (Carter et al., 2010). It is commonly known that women are still underrepresented in most boards despite their importance on corporate boards. This is quite controversial, considering that more than half of the university graduates in Europe are women (European Union, 2020).

In order to ensure the talents of women are optimally utilized, some European governments have introduced gender quotas, mandating firms to assign a certain percentage of their board seats to women. However, the introduction of these quotas is still not universally supported. Firms that have been mandated to appoint a certain percentage of their board seats to women risk both increased disagreement among board members and slower decision-making (Hamrick & Mason, 1984; Knight et al., 1999). Others claim that female directors will only be appointed as tokens, questioning their contribution to the decision-making process (Elstad & Ladegard, 2012). The current debate on the role of women on corporate boards and the controversy surrounding the value-creation of M&As asks for a re-evaluation of the relationship between them.

This study examines the effect of gender diversity on acquiring boards on M&A performance, which is measured as the cumulative abnormal return (CAR) for the acquirer around the announcement date. Moreover, the effect of gender quotas on the outcome of M&As is investigated. To test the hypotheses, a dataset of 14,982 M&A deals of 2,579 publicly listed European firms from 2003 to 2018 is analyzed. The data within this dataset is obtained from Datastream, BoardEx, and the Worldbank Database. The results indicate that board gender diversity is not significantly related to the M&A performances of acquiring firms. Furthermore, it is found that the presence of at least three female directors on the acquiring board does not significantly affect the M&A performances. Finally, it is found that the effect of board gender diversity and M&A performances is significantly stronger for acquirers located in a country with a binding gender quota.

This study complements existing literature in several ways. First of all, this study is among the first to relate board gender diversity to the CARs of acquiring firms in M&A deals. Several studies have examined market reactions to the appointment of women on corporate boards, finding that stock prices react positively to the announcement of appointing a female director to the board (Campbell & Mínguez-Vera, 2010; Kang et al., 2010). This study extends knowledge by examining how the presence of women on corporate boards affects the market reactions to M&A announcements. Secondly, this study provides new insights on the effect on gender quotas on the market reactions around M&A announcements. By differentiating between binding and non-binding gender quotas, this study provides a more detailed analysis on the effects of different types of action programs. Finally, this study contributes to the empirical record by adding European firms to the data sample. Levi et al. (2008) conducted a similar study which focused on US firms. However, the growing number of countries

introducing gender quotas increases the interest in gender effects in European firms. Therefore, this study is focused on European firms.

This study also makes some practical contributions. Since no significant relationship is found between the effect of board gender diversity and M&A performance, this study emphasizes that the appointment of female directors to the board should not be based on future M&A performances, but on other criteria. On top of that, the findings could also guide policy makers and regulator in their decisions regarding gender quota laws. The fact that M&A performances are significantly lower in countries with a binding gender quota, might withhold policy makers and regulators in implementing such a law.

The remainder of this paper is structured as follows. The next chapter contains an overview of the existing literature and theories concerning the effect of female directors on corporate decisions and performances. Based upon that, three hypotheses are developed. The third chapter describes the research method and data which are used to test the hypotheses. The fourth chapter presents the results and tests the hypotheses. Finally, the fifth chapter discusses the results and concludes this paper.

2. Theoretical Background and Hypotheses Development

2.1 Gender Diversity and Corporate Governance

In order to examine whether gender diversity in corporate boards positively affects the M&A performances, it is essential to understand the importance of good corporate governance. Corporate governance refers to a set of mechanisms by which firms are controlled and managed (Larcker et al., 2007). In firms with a separation between ownership and control, these mechanisms help shareholders to maintain control over the corporate insiders, thereby ensuring that their interests are served (John & Senbet, 1998; La Porta et al., 2000). In general, shareholders authorize the managers to maximize shareholder value (Jensen & Meckling, 1979). Therefore, by serving the interests of the shareholders, good corporate governance generally enhances corporate growth. The board of directors is an important part of the corporate governance structure. Boards have the authority to make important corporate decisions, set strategies, and monitor the corporate performances (Baysinger & Butler, 1985). Moreover, the board is responsible for constraining managerial opportunism, ensuring that the firm acts in the best interest of its shareholders. The extent to which a board is able to perform these tasks is assumed to depend on its composition (Carter et al., 2010). This suggests that gender diversity, as an aspect of board composition, is a determinant of good corporate governance.

Gender diversity affects the decision-making process of corporate boards in several ways. In general, women are more likely to have expertise outside the field of business (Hillman et al., 2002). By providing new insights and perspectives to the board, female directors could enhance problem-solving. This will result in better understanding of the business environment, thereby improving the decision-making quality (Campbell & Mínguez-Vera, 2008). Moreover, gender diverse boards are likely to pay more attention to their monitoring function (Carter et al., 2010). An appropriate combination of expertise and experience is necessary to evaluate the management. For instance, female directors confront managers with different questions than their male counterparts. However, gender diversity could also reduce the quality of the decision-making in the board. For instance, heterogeneous boards are less coherent and communicate less frequently (Campbell & Mínguez-Vera, 2008; Knight et. al., 1999). Additionally, diversity tends to result in increased group conflict, which will lead to slower and less efficient decision-making. In short, there are arguments both in favor and against the impact of female directors

in the decision-making process. In order to dig deeper into the correlation between gender diversity and M&A performance, it is also important to consider the differences in behavior between men and women.

2.2 Gender Behavioral Differences in Corporate Finance

Overconfidence

Men and women behave differently. Some traits are even labeled masculine or feminine. In general, it is argued that these masculine traits often contribute to poor corporate decisions (Barber & Odean, 2001; Malmendier & Tate, 2008). One of these traits is overconfidence, a trait that is typically displayed by managers (Kahneman & Lovallo, 1993). According to Malmendier & Tate (2005), overconfidence appears in two ways. First, overconfident managers tend to overestimate the future returns of their investments. They either believe that their managerial skills are better than others' (e.g. the target's management), or they miscalculate the potential downside of the investments. Second, overconfident managers claim that the market underestimates their managerial skills and therefore undervalues the current assets of their firm. With respect to M&As, the hubris hypothesis of Roll (1986) even argues that managerial overconfidence is one of the main reasons why M&As take place. Managers simply overestimate the financial synergy of the takeover. Therefore, it is not surprising that it is found that overconfident managers of acquiring firms pay higher bid premiums and gain lower announcement returns (Doukas & Petmezas, 2007; Malmendier & Tate, 2005).

While men are generally overconfident, women see their predictions as a part of a large set of possible outcomes (Levi et al., 2011). On top of that, women tend to be less positive about the future returns of their investments. By analyzing data for over 35,000 households, the study of Barber & Odean (2001) confirms that men indeed invest more but gain less than women. This indicates that females make more rational investment decisions. More specifically, by combining the findings that overconfident managers gain lower announcement returns and that women are generally less overconfident, one would expect that acquiring firms with more women on the board will have higher M&A returns.

Risk-seeking

Another essential difference between men and women is the level of risk-seeking. Risk-seeking behavior is often observed when managers prefer a small probability of high gains over the

reasonable gains (Tversky & Kahneman, 1992). This is often the case when managers consider an M&A. Acquiring managers often expect to gain from M&As, whereas, in reality, they often result in a loss.

In general, women are more risk-averse, whereas men are more risk-seeking (Byrnes et al., 1999; Eckel & Grossman, 2008). Moreover, it is found that women are less willing to take risky decisions on behalf of others (Ertac & Gurdal, 2012). Since women are relatively risk-averse, they make less and smaller investments in case the investment is risky (Charness & Gneezy, 2012). The main explanation why men and women have different risk preferences is because of the different emotional reactions they have in risky situations (Croson & Gneezy, 2009; Loewenstein, 2001). Since women are more risk-averse, it is expected that they prefer sure outcomes over a gamble. As a result, women are more likely to make well-considered decisions regarding M&A opportunities, leading to higher announcement returns.

2.3 Gender Diversity on Corporate Boards and M&As

Although there is a growing body of literature on the effect of gender on several corporate issues, not much research has yet been done on the relationship between gender and M&As. Levi et al. (2008) were among the first to contribute to this topic. They examined whether the gender of board members from target firms affects the bid premium and announcement returns for the target. Their main conclusion is that the bid premium significantly reduces when the proportion of women on the target's board increases. Moreover, they found that the announcement returns for the target were substantially smaller with a higher proportion of women on the target's board. Later, Levi et al. (2014) found that the presence of female directors on the board has a negative effect on the number of M&As that are undertaken. They reason that women are less interested in empire-building compared to men and, therefore, they feel less of an urge to engage in M&As.

However, this study focuses on the M&A performances of acquiring firms. A common strategy to measure the outcome of an M&A deal is to examine the CAR around the announcement date. The use of market-based measures like these is justified since they are direct and unbiased measures of shareholder values (Lubatkin & Schrieves, 1986; Meglio & Risberg, 2011). On the other hand, accounting-based measures are often biased because they focus on the past, do not consider changes in risk, and are often manipulated by managers (Boyd et al., 2005). The CAR reflects immediate market reactions to the M&A announcement and

indicates whether shareholders believe the deal is value enhancing. There are two main theories that predict the effect of gender diversity on M&As: the resource dependence theory and the agency theory. Finally, insights from the critical mass theory are taken into account too.

Resource Dependence Theory

According to the resource dependence theory, firm success is highly dependent on the ability to acquire external resources. Pfeffer (1976) provides three arguments, which are rooted in the resource dependence theory, to explain why firms engage in M&As. First of all, firms could reduce their competition by absorbing other competitors. Secondly, by absorbing purchasers of output, firms could manage their interdependence with other entities. Finally, firms could absorb suppliers, which both diversifies the operations and reduces the dependence on current trading partners. These arguments are well supported by empirical research. The study of Pfeffer (1972), for instance, illustrates that M&As are indeed often used to reduce both competition and the interdependency between purchasers and suppliers. Moreover, Bauer & Matzler (2014) provide evidence that the outcome of M&As is determined by the interdependencies of several externalities.

According to the resource dependence theory, the board of directors is one of the key drivers of success. The board is responsible for maintaining contact with external institutions and organizations (Carter et al., 2010). Thus, boards are important to minimize the firm's dependence of external resources. According to Pfeffer & Salancik (2003) boards can provide four main benefits: they advise and counsel, provide legitimacy, channel information to external entities, and have preferential access to resources. However, the composition of the board determines which beneficial resources are provided to the firm (Hillman et al., 2000). As mentioned earlier, increasing the number of women on the board will bring new insights and perspectives to the decision-making process, which enhances their advising and counseling. Moreover, due to the social and political pressure to include more women in corporate boards, gender diversity adds legitimacy to firms (Milliken & Martins, 1996). Furthermore, because the beliefs and perspectives of women differ from those of men, gender diverse boards are likely to link the firm to a broader set of external entities, like purchasers and suppliers. Based upon these arguments, it is likely that the presence of women on corporate boards positively affects the quality of the decisions made regarding M&A opportunities.

Agency theory

The agency theory provides an explanation of why a substantial number of M&As have a negative effect on the stock prices of acquiring firms. Agency problems arise within firms with a separation of ownership and control (Eisenhardt, 1989). A major agency problem is that managers and shareholders have conflicting interests. Whereas managers often aspire power and empire-building, shareholders expect them to maximize shareholder value. However, monitoring managers is a complicated and expensive process. The second problem is that managers are relatively risk-seeking compared to shareholders. Taking M&As into account, both of these problems are relevant concerning M&As. Managers like to expand their power by engaging in risky M&As deals, although these are often detrimental to the shareholder value.

From an agency theory perspective, the fundamental role of the board is to monitor and control managers (Jensen & Meckling, 1976). More specifically, acting on behalf of the shareholders, the board serves to prevent managers from behaving opportunistically. In other words, the board has to ensure that the firm does not engage in value-destroying M&As. Since it is found that female directors pay more attention to the monitoring process than their male counterparts, one would expect that female directors are more likely to vote against risky M&A opportunities. On top of that, women are less self-centered and are, therefore, more likely to represent the shareholders' interests on the board. To conclude, based upon the agency theory one would expect higher M&A performances for firms with more gender diverse boards.

Critical mass theory

Previous studies have disagreed over whether board gender diversity positively (Campbell & Mínguez-Vera, 2008; Smith et al., 2006) or negatively (Adams & Ferreira, 2009; Dobbin & Jung, 2010) affects corporate performances. The critical mass theory explains these controversial findings by arguing that only boards with a critical number of at least three women on the board will experience a positive effect on performance (Joecks et al., 2013; Kramer et al., 2006; Liu et al., 2014). Kramer et al. (2006) argue that women who serve alone on the board are being stereotyped, are either highly visible or invisible, and are seen as being representative of all women. In other words, they feel like they are being used as a token. Boards on which this is the case, are labeled as *skewed* (Joecks et al., 2013). By adding two or more women to the board, the presence of women becomes normal. As a result, female directors are more likely to be vocal and to raise diverse issues (Kramer et al., 2006). Boards like these, with less extreme

dispersion, are labeled as *tilted* (Joecks et al., 2013). Women are recognized for their skills and experience, in these boards. When boards shift from a *skewed* to a *tilted* board, it is more likely that women will be treated like individuals instead of a subgroup. In that case, the positive effect of female directors on performances will be much more evident.

2.4 Gender Quotas in Europe

Despite the social desire for gender equality, it is commonly known that women are still underrepresented on corporate boards. In 2016, only 23.5% of the board seats in publicly listed firms in the European Union were assigned to women (Jourouva, 2016). In order to ensure that the talents of women are optimally utilized, several European governments have introduced gender quota laws, obligating companies to assign a certain percentage of their board seats to women. In 2012, the European Union even passed a law requiring listed European firms to have at least 40% of their boards seats held by women by 2020 (European Comission, 2012). The main reason for this legislation was the loss of economic growth potential which would result from the underutilization of the talents of higher educated women. Moreover, the commission argued that the efficient mobilization of human capital would be crucial for the competitive advantage of the European Union compared to other countries. However, several European countries had already imposed gender quotas before 2012.

Norway has played a leading role in the pursuit of gender equality in top management positions in European firms. In politics, education, and labor force participation, gender equality was relatively high in Norway. However, in top management functions, the country faced striking imbalances between men and women. In response to the continued criticism of male dominance in these positions, the Norwegian government introduced a gender quota law for corporate boards, mandating listed firms to assign at least 40% of their board seats to women (Dale-Olsen et al., 2013). Listed Norwegian firms that do not comply with this law will be liquidated. The example of Norway was soon followed by other European countries. However, most of these countries implemented soft quota laws. Violating these soft laws does not result in extreme sanctions. Table 1 provides an overview of the gender quotas per country. At the end of 2018, sixteen European countries have introduced their own gender quotas, of which most differ slightly from the initial Norwegian quota law.

These gender quota laws are likely to affect the impact of board gender diversity on M&A performances. The implementation of gender quota could increase the motivation of

Table 2.1: Gender quotas in the countries in the sample [1]

Country	Quota	Year	Description
Binding gender quotas			
Belgium	33%	2011	Sanctions for non-compliers include suspending directors' benefits and voiding the appointment directors (Terjesen et al., 2015).
France	40%	2011	Sanctions for non-compliers include directors not receiving fees (Terjesen et al., 2015).
Germany	30%	2015	Sanctions for non-compliers include filling any vacant board seats with women (Terjesen & Sealy, 2016).
Italy	33%	2011	Sanctions for non-compliers include fines, and directors losing their offices (Terjesen et al., 2015).
Norway	40%	2003	Sanctions for non-compliers include fines, refusal to register the board, and firm dissolution (Terjesen et al., 2015).
Portugal	20%	2017	Sanctions for non-compliers include fines (Mensi-Klarbach & Seierstad, 2020).
Non-Binding gender quotas			
Austria	-	2008	Firm-specific gender quotas for state-owned entities (Terjesen et al., 2015).
Belgium	30%	2008	Firms are required to evaluate the gender diversity of their boards (Terjesen et al., 2015).
Denmark	-	2010	Firms are required to evaluate the gender diversity of their boards (Jourová, 2016).
Finland	-	2008	State-owned entities are required to have an appropriate representation of both genders on the board (Jourová, 2016).
France	20%	2010	Non-compliers' directors will not receive fees (Terjesen et al., 2015).
Germany	-	2010	Firms are required to evaluate the gender diversity of their boards when appointing board seats (Terjesen et al., 2015).
Greece	-	2016	Policy target quota of 33% for state-owned entities (Jourová, 2016).
Iceland	40%	2010	Gender quota for firms with more than 50 employees (Terjesen & Sealy, 2016).
Ireland	-	2010	Policy target quota of 40% for state-owned entities (Jourová, 2016).
Luxembourg	-	2009	Firms are obligated to have an appropriate representation of both genders on the board (Jourová, 2016).
Netherlands	-	2008	For public firms with more than 250 employees a quota of 30% is set (Terjesen et al., 2015).
Spain	40%	2007	Non-compliers risk lower public subsidies and state contracts (Terjesen et al., 2015).
Sweden	-	2010	Firms are required to have a balanced representation of both male and female directors on the board (Jourová, 2016).
Switzerland	-	2018	For firms with more than 250 employees, a quota of 30% is set (Rossi, 2019).
United Kingdom	-	2012	Firms are required to evaluate the gender diversity of their boards (Terjesen et al., 2015).

[1] Note that Belgium, France, and Germany first implemented soft quotas and then later implemented binding quotas.

qualified women to apply for board seats because they might feel that they have a fairer opportunity to get the job. Furthermore, firms that are required to comply with gender quota laws might search for qualified female board members more intensively (Bertrand et al., 2019). In case of an increase in qualified female board members, the effect of board gender diversity is expected to be stronger. On the other hand, Kakabadse et al. (2015) found that most female directors themselves fear that gender quotas would undermine the potential positive effects of women in the board. Their main concern is that gender quotas result in the selection of unqualified women that will only be used as tokens. In that case the effect of board gender diversity is expected to be weaker. However, this claim is rather disputable as women represent more than half of the university graduates in Europe, which indicates that there are enough qualified female candidates. To conclude, gender quotas are likely to have a significant impact on the effect of board gender diversity on the M&A performances.

2.5 Development of Hypotheses

The behavioral differences between men and women and the arguments provided by the resource dependence theory and agency theory are used to develop the hypotheses. First of all, women are less overconfident and risk-seeking than men. This implies that women make more rational decisions and are less likely to overinvest. Secondly, the resource dependence theory argues that the presence of women on corporate boards increases the number of beneficial resources that are provided to the firm. Finally, the agency theory argues that women are less self-centered than men and that female directors are therefore more likely to act in the interest of the shareholders, for instance by paying more attention to the monitoring function of the board. Thus, a board in which women are well-presented is likely to be better able to select value-enhancing M&As. The expected positive effect of board gender diversity on M&A performance is captured in the following hypothesis:

H_1: Ceteris paribus, the proportion of female directors on corporate boards is positively associated with the M&A performances of acquiring firms.

Moreover, the argument of the critical mass theory that a positive performance effect is more likely to appear in case of at least three women on the board, is formulated in the following hypothesis:

H_2: *Ceteris paribus, the M&A performances will be higher for acquiring firms with at least three female directors on the corporate board.*

Furthermore, this study aims to examine whether the effect of board gender diversity on M&A performances is stronger for acquirers that have to comply with a binding gender quota. These binding quotas mandate firms to appoint a certain number of board seats to female directors, which results in more gender diverse boards. The higher the board gender diversity, the stronger the expected effect of female directors on M&A performances is. Due to the fact that firms in countries with a soft quota face less strict sanctions for not having a certain percentage of female directors on the board, it is expected that the board gender diversity in these firms is lower. The same goes for firms that do not have to comply with a gender quota at all. Due to the lower expected board gender diversity in countries with of a soft or no gender quota, it is expected that the effect of board gender diversity on M&A performances is weaker in these countries. This had led to the formulation of the following hypothesis:

H_3: *Ceteris paribus, the effect of the proportion of female directors on corporate boards on the M&A performances of acquiring firms is stronger in countries with a binding gender quota.*

Finally, this study examines whether the effect of the presence of at least three female directors on the board on M&A performances differs for acquirers that have to comply with a binding quota. Assuming that the open-mindedness towards gender equality is stronger in countries with a binding quota, it is likely that the insights and opinions of these three female directors count even more in these countries. Therefore, the following hypothesis is formulated:

H_4: *Ceteris paribus, the effect of having at least three female directors on the corporate board on the M&A performances of acquiring firms is stronger in countries with a binding gender quota.*

3. Research Method

3.1 Data description

A quantitative approach is used to collect and analyze the data in order to test the hypotheses. The data that is used to calculate the CARs of the acquiring firms is obtained from Thomson Reuters Datastream. This database contains financial data on both firm-specific and market performance indicators. Data on the board composition is obtained from BoardEx. This database contains information on most board members around the world, including their age, gender, and role. Due to its accuracy and completeness, BoardEx is internationally recognized (Cross et al., 2017). The data with regard to the gender quotas imposed by European countries is mainly obtained from the European Commission (2019) and Terjesen et al. (2015). For a more comprehensive overview, see table 1 in the previous section. Finally, the financial control variables are also obtained from Thomson Reuters Datastream and the country control variable is obtained from the Worldbank Database. Table 3.2, at the end of the chapter, provides an overview of all variables and illustrates which database is used for each variable.

The sample is set up as follows. First, all European M&A transactions between 2003-2018 are obtained. This time frame is chosen because 2003 is the first year in which a country introduced a gender quota law. Another reason is the biased data from Datastream prior to 2003 (Iqbal et al., 2009). Furthermore, the deals must meet the following criteria in order to be included in the sample:

1. The acquirer is a publicly listed European firm;
2. The target is a European public firm, private firm, or subsidiary;
3. The acquirer owns less than 50% of the target's shares before the announcement date and obtains 100% of the target's shares, in case the target is a public or private firm;
4. The transaction value is at least €1 million;
5. Data on the acquirer is available from both BoardEx and Thomson Reuters Datastream.

These criteria finally result in a sample of 14,982 M&A deals of 2,579 firms from 23 different European countries. The geographical distribution of the acquirers can be found in Table 7 in Appendix A.

3.2 Variables

3.2.1 Dependent variable

The M&A performance of the acquiring firms is measured by the CAR around the announcement date. The CARs are obtained by performing an event study. This methodology rests on the assumption that the effect of the announcement is immediately reflected in the stock price. In the financial literature, the CAR is a widely used measure to quantify the performance effects of certain events, such as M&A announcements (Binder, 1998; MacKinlay, 1997; Moeller et al., 2005). The first step is to identify the event window, which is used to measure the price reaction of the announcements. In order to minimize effects of other events on the acquirers' stock prices, a short event window of three days [-1, +1] around the announcement date is used (Andrade et al., 2001; Moeller et al., 2005). The next step is to determine the normal returns around the announcement date. These normal returns are based upon the acquirer's recent stock performances (α) and its sensitivity to general market movements (β). In accordance with Moeller et al. (2005), these firm-specific parameters are measured over an estimation window of 200 days [-205, -6] just prior to the announcement date. The normal returns (R) are calculated by using the following equation:

$$R_{i,t} = \alpha_i + \beta_i R_{m,t} + \varepsilon_{i,t} \quad (1)$$

where $R_{i,t}$ is the stock return for firm i at time t; α_i is the average stock return for firm i in case the market return equals zero; β_i is the systematic risk of stock i, which reflects its sensitivity to the market movements; $R_{m,t}$ is the rate of return in the local market on day t; and $\varepsilon_{i,t}$ is the error term. Equation (1) is estimated over the days in estimation window. With the alphas and betas from this equation, the normal returns are predicted for the days in the event window. The abnormal returns (AR) are then calculated from the following equation:

$$AR_{i,t} = R_{i,t} - \hat{\alpha}_{i,t} - \hat{\beta}_i R_{m,t} \quad (2)$$

where $AR_{i,t}$ is the abnormal return for firm i at time t; and $R_{i,t}$ is the actual stock return for firm i at time t. Finally, by aggregating the abnormal returns for each firm over the event window, the firm-specific CARs are obtained. Therefore, the following equation is used:

$$CAR3_{i(t_1,t_2)} = \sum_{t=t_1}^{t_2} AR_{i,t} \quad (3)$$

where $CAR3_{i(t_1,t_2)}$ is the cumulative abnormal return for firm i over event window; t_1 is the first day of the event window [-1]; and t_2 is the last day of the event window [+1]. A positive *CAR3* indicates that the share price of the acquirer has increased due to the announcement of the M&A deal, and vice versa.

3.2.2 Independent variable

Like most studies, this study measures board gender diversity (*BDIV*) as the proportion of female directors on the corporate boards of the acquiring firms (Farrell & Hersch, 2005; Campbell & Mínguez-Vera, 2008; Levi et al., 2014). More specifically, it is measured as the number of female directors on the board by the total number of directors on the board.

Furthermore, considering the critical mass theory, a variable is included to examine whether the presence of at least three female directors in the acquiring boards affects the CARs of the acquiring firms. This dummy variable (*FEM3*) has the value of 1 if at least three female directors are present on the corporate board of the acquiring firms, and 0 otherwise.

Finally, in order to examine the effect of gender quota laws on the CARs of the acquiring firms, a dummy variable (*QUO)* is included in the model. This variable has the value of 0 if the acquirer is located in a country with no quota or a soft quota, and 1 if the acquirer is located in a country with a binding quota. Then, in order to test for the interaction effect, this dummy variable is multiplied by the gender diversity variables, which gives the following two interaction variables: *BDIV*QUO* and *FEM3*QUO.*

3.2.3 Control variables

In order to control for other factors that impact the acquirers' CARs, several control variables are included. These consist of board controls, financial controls, and country controls, which all apply to the acquiring firms in the sample.

Previous studies on market reactions have included several board control variables to control for potential biases (Levi & Zhang, 2014; Yermack, 1996). These variables include

board size (*BSIZE*), board independence (*BIND*), and CEO duality (*CDUA*). First of all, board size is measured as the total number of directors on the board. Most studies argue that board size has a negative effect on the corporate performances. Due to poorer communication, increasing group conflict, and increasing agency problems, larger boards are expected to make worse investment decisions than smaller boards (Cheng, 2005; Goodstein et al., 1994). Therefore, the board size is expected to negatively affect the acquirers' CARs. Secondly, board independence is measured as the proportion of non-executive directors on the board. According to previous studies from Fama & Jensen (1983) and Williamson (1981), board independence increases the board's monitoring ability, reducing managerial opportunism. Therefore, the board independence is likely to positively affect the acquirers' CARs. Finally, CEO duality is a dummy variable that equals 1 if the CEO also holds the position of the chairman of the board, and 0 otherwise. Most studies argue that CEO duality results in both increasing conflicts of interest between managers and shareholders (Boyd, 1995; Rechner & Dalton; 1991). Moreover, CEO duality reduces the board's ability to perform its governing function. Therefore, it is expected that CEO duality negatively affects the acquirers' CARs.

Besides board controls, the model includes several financial control variables. Most of these financial controls are in line with the studies of Adams & Ferreira (2009) and Levi & Zhang (2014), including the firm size (S*IZE*), return on assets (*ROA*), Tobin's Q (*TQ*), leverage (*LEV*), and cash holdings (*CASH*). Firm size is measured by taking the natural logarithm of the firms' sales, which is in line with Adams & Ferreira (2009). According to Jensen (1986), managers of large firms often refuse to shed funds which they cannot profitably invest, thereby expanding the firm beyond its optimal size. Therefore, it is expected that larger firms make less efficient investments, indicating a negative relationship between firm size and the acquirers' CARs. Secondly, the profitability of the acquirers is measured by the return on assets and Tobin's Q. In general, acquirers with a higher profitability are expected to have higher returns on their M&A investments (Servaes, 1991). The fourth financial control variable is the leverage (*LEV*), measured by dividing the total debt by the total assets. Highly levered firms are more likely to be strictly monitored, increasing the managerial work effort. Therefore, these firms are more likely to make good M&A decisions (Jensen 1986). This indicates a positive relationship between leverage and the acquirers' CARs. The last financial control variable is the amount of cash holdings, measured by the cash and cash equivalents divided by the total assets. Since managers of firms that hold excessive cash holdings are more likely to overpay for target firms

(Malmendier & Tate, 2008), a negative relationship between cash holdings and the acquirers' CARs is expected.

Finally, year, industry, and country fixed effects are included in the model. Year fixed effects are included, since the market reactions to the stock prices of the acquirer are likely to be influenced by year-specific externalities, like the 2007-2008 financial crisis (Erkens et al., 2010). Furthermore, industry fixed effects are included since M&A performances could be influenced by the acquirer's industry-specific characteristics, like the level of competition. Firms are categorized based on the 48-industry classifications of Fama & French (1997). Finally, country fixed effects are included to control for differences in financial systems (Demirgüç-Kunt & Levine, 1999) and corporate governance environments (Aggarwal et al., 2011) between the countries in the sample. The acquirers are, therefore, categorized by the country they are located in.

3.3 Regression models

In line with previous studies on the effect of gender on abnormal returns (e.g. Campbell & Mínguez-Vera, 2010; Huang & Kisgen, 2013; Levi et al., 2014), this study performs a pooled Ordinary Least Squares (OLS) regression as method of analysis. In order to use an OLS regression, several assumptions have to be met. First of all, the regression model should be linear in the coefficients and standard errors. By making scatterplots, it is found that this is the case. Second, the independent and control variables (explanators) should be normally distributed. Besides the *CASH* variable, all explanators are found to be normally distributed. For *CASH*, the natural logarithm is taken instead. Third, the observations of the standard error should be uncorrelated with each other. To test for autocorrelation, a Durbin-Watson test is performed. Since the d-statistic equals 2.00 it can be concluded that there is no autocorrelation (Nerlove & Wallis, 1966). Fourth, the standard errors should have a constant variance, which is called homoscedasticity. By performing a Breusch-Pagan test, it is found that the H_0 hypothesis of homoscedasticity must be rejected, since some standard errors do not have a constant variance. The heteroscedasticity in the data reduces the validity of the regression results. In order to increase this validity, clustered standard errors are used. Finally, the models are tested for multicollinearity. This is necessary, since it is difficult for the model to distinguish the separate effects of the variables in case some variables are highly correlated. Tables 8 and 9 in Appendix B illustrate the correlation matrices of both the model in which *BDIV* is used as

the measure of gender diversity and the model in which *FEM3* is used as measure, respectively. The high correlations in the table require further explanation. First of all, the interaction terms *BDIV*QUO* and *FEM3*QUO* are of course highly correlated with their separate components. Furthermore, both tables illustrate high correlations between *BSIZE, SIZE, and logCASH*. In order to ensure that these high correlations do no affect the results, separate regression are performed, in which the highly correlating variables are excluded by turn. For the other explanators the correlations are between and -0.1644 and 0.3583. Since these are relatively far from the boundaries of -0.7 and 0.7, there is no multicollinearity between these variables (George & Mallery, 1999).

Model 1: Proportion of female directors on acquiring board (*BDIV*) as main explanator

To test the first and third hypotheses, in which the proportion of female directors on the acquiring board serves as the main explanator, the following pooled OLS regression analysis with clustered standard errors will be performed:

$$CAR3_{i_{(t_1,t_2)}} = \beta_0 + \beta_1 BDIV_{i,t} + \beta_2 QUO_{j,t} + \beta_3 BDIV_{i,t} * QUO_{j,t} + \beta_4 BSIZE_{i,t} + \beta_5 BIND_{i,t} + \beta_6 CDUA_{i,t} + \beta_7 SIZE_{i,t} + \beta_8 ROA_{i,t} + \beta_9 TQ_{i,t} + \beta_{10} LEV_{i,t} + \beta_{11} CASH_{i,t} + \beta_{12} YEAR + \beta_{13} COUNTRY + \beta_{14} INDUSTRY + \epsilon_{i,t}$$

The variable descriptions can be found in table 3.1. Furthermore, *i* refers to a firm-level variable, *j* refers to a country-level variable, and *t* refers to the announcement year. The error term of the model is represented by $\epsilon_{i,t}$. These clarifications are also applicable to the regression analysis of model 2.

Model 2: At least three female directors on acquiring board (*FEM3*) as main explanator

In order to test the second and fourth hypotheses, in which the presence of at least three female directors on the acquiring board serves as the main explanator, the following pooled OLS regression analysis with clustered standard errors will be performed:

$$CAR3_{i_{(t_1,t_2)}} = \beta_0 + \beta_1 FEM3_{i,t} + \beta_2 QUO_{j,t} + \beta_3 FEM3_{i,t} * QUO_{j,t} + \beta_4 BSIZE_{i,t} + \beta_5 BIND_{i,t} + \beta_6 CDUA_{i,t} + \beta_7 SIZE_{i,t} + \beta_8 ROA_{i,t} + \beta_9 TQ_{i,t} + \beta_{10} LEV_{i,t} + \beta_{11} CASH_{i,t} + \beta_{12} YEAR + \beta_{13} COUNTRY + \beta_{14} INDUSTRY + \epsilon_{i,t}$$

Table 3.1: Variable descriptions [2]

Variable	Definition	Data source
Cumulative abnormal returns *(CAR3)*	The sum of the abnormal returns over the event window of three days. The abnormal returns are defined as the actual returns minus the expected returns, which are calculated over the estimation window of 200 days just prior to the announcement date.	Datastream
Gender diversity *(BDIV)*	The ratio of the number of female directors on the corporate board to the total number of directors on the corporate board.	BoardEx
At least 3 females on board (*FEM3)*	Dummy variable with the value of 0 if the firm has less than three female directors on the board, and 1 if the firm has three or more female directors on the board.	BoardEx
Gender quota implemented (*QUO)*	Dummy variable with the value of 1 if the acquirer is located in a country with no gender quota law or a soft gender quota, and 2 if the acquirer is located in a country with a binding gender quota.	See table 2.1
Board size *(BSIZE)*	The total number of directors on the corporate board.	BoardEx
Board independence (*BIND)*	The ratio of the number of independent directors on the corporate board to the total number of directors on the corporate board.	BoardEx
Firm size *(SIZE)*	The natural logarithm of the yearly revenues.	Datastream
Return on assets *(ROA)*	The net income divided by the total assets.	Datastream
Tobin's Q *(TQ)*	The market value divided by the book value.	Datastream
Leverage *(LEV)*	The total liabilities by the total assets.	Datastream
Cash holdings *(CASH)*	The total amount of cash holdings and cash equivalents.	Datastream
Year fixed effects *(YEAR)*	Dummy variable for each year from 2003-2018.	N/A.
Industry fixed effects *(INDUSTRY)*	Dummy variable for each industry, based on the 48-industry classifications of Fama and French (1997).	Datastream
Country fixed effects *(COUNTRY)*	Dummy variable for each country in which the acquirers are located.	N/A.

[2] All of the variables are measured for the acquiring firms only and relate to the year of the deal announcement.

4. Results

4.1 Descriptive statistics

Table 4.1 illustrates the descriptive statistics of all variables in the sample. Since acquirers with missing variables were excluded from the sample, all variables have 14,982 observations. The average *CAR3* is 0.84%, which indicates that, on average, deal announcements have a positive effect on the short-term stock returns of the acquirer. Moreover, the dummy variable *CAR3D* is added, which has the value of 0 if the *CAR3* of the deal is negative and 1 if it is positive. It is found that 55% of the M&A deals in the sample had a positive *CAR3*. Considering the gender diversity of the acquiring boards, only 14.60% of the directors are female. The average of 0.2221 for *FEM3* indicates that 22.21% of the acquirers in the sample have at least three female directors on their corporate board. Finally, the table illustrates that 16.91% of the acquirers in the sample are located in a country that has implemented a binding gender quota.

Table 4.1: Descriptive statistics

Variable	N	Mean	St. dev.	Min.	Max.
CAR3	14,982	0.8390	4.9143	-49.3950	93.2145
CAR3D	14,982	0.5577	0.7306	0	1
BDIV	14,982	0.1460	1.3941	0	0.7500
FEM3	14,982	0.2221	0.4153	0	1
QUO	14,982	0.1693	0.3750	0	1
BSIZE	14,982	9.8993	4.6560	2	54
BIND	14,982	0.4556	0.2495	0	1
CDUA	14,982	0.3747	0.4840	0	1
SIZE	14,982	13.7464	2.3189	0.6931	19.0211
ROA	14,982	0.0532	0.1164	-3.2961	1.3113
TQ	14,982	1.7512	2.9698	-71.7795	322.6255
LEV	14,982	0.5469	4.8578	-230.7208	155.3471
logCASH	14,982	11.5425	2.4526	0.0000	19.4309

The table shows some extreme outliers, especially for *CAR3*, *TQ*, and *LEV*. To increase the robustness of the results, additional regressions are performed in which all non-dummy variables are winsorized at the 1st and 99th percentiles.

To spot any curious developments of the main variables over time, table 4.2 illustrates the number of observations and the averages of the *CAR3, BDIV, FEM3,* and *QUO* variables over time. The table shows some interesting findings. First of all, in the first five years within

the time frame the number of M&As was increasing. From 2008, this number started to decrease for two years, which is likely to be a consequence of the financial crisis of 2007-2008. This crisis is also likely to be the cause of the remarkable low average *CAR3* in 2008, since the crisis led to a dramatic decline in the stock returns in general. However, de average *CAR3* is still positive. A possible explanation is that the announcement of an M&A during a crisis indicates that a firm is financially healthy (Beltratti & Paladino, 2013). Another explanation why the average *CAR3* is still positive during the years after the crisis is that investors realize that acquirers may benefit from the fact that competitors are forced to sell their assets for a low price. With regard to board gender diversity, the table shows that the average number of female directors on the board has increased every year, with 2006 as an exception. This goes along with the increasing number of acquirers that have at least three female board members on their corporate boards every year. Finally, the table illustrates that the percentage of acquirers located in a country with a binding gender quota increased from 2.37% in 2003 to 33.11% in 2018.

Table 4.2: Development of the averages of the main variables

Year	Obs.	CAR3	BDIV	FEM3	QUO
2003	506	1.0509	6.74%	9.29%	2.37%
2004	614	0.8314	7.17%	6.84%	3.91%
2005	883	0.8318	7.70%	8.61%	3.74%
2006	1,089	0.7995	7.54%	5.97%	2.75%
2007	1,291	0.8437	8.41%	7.98%	2.71%
2008	984	0.2764	8.72%	9.14%	1.83%
2009	592	1.0776	10.23%	11.82%	1.69%
2010	840	0.7223	11.11%	12.62%	2.02%
2011	940	0.5941	12.41%	16.49%	23.94%
2012	797	0.3082	14.49%	22.22%	22.71%
2013	775	0.9046	16.32%	29.81%	26.07%
2014	964	1.1095	17.61%	29.46%	22.09%
2015	1,139	1.1923	19.15%	33.54%	32.31%
2016	1,154	0.9622	21.71%	36.05%	31.20%
2017	1,233	1.0012	24.45%	42.57%	33.82%
2018	1,181	0.8797	26.44%	47.33%	33.11%

4.2 Regression analysis

Several pooled OLS regressions are performed in order to test the hypotheses. Table 4.3 illustrates the regression results for the first two hypotheses. The first hypothesis expects that board gender diversity is positively associated to the CARs of acquiring European firms around

Table 4.3: Pooled OLS regression

Dependent variable	**CAR3**		
	(1)	**(2)**	**(3)**
BDIV		-0.2062	
		(-0.47)	
3FEM			0.0705
			(0.62)
BSIZE	-0.0126	-0.0025	-0.0041
	(-1.01)	(-0.16)	(-0.27)
BIND	-0.2033	-0.4316*	-0.4355*
	(-0.98)	(-1.87)	(-1.88)
CDUA	0.1187	0.2227*	0.2226*
	(1.20)	(1.74)	(1.75)
SIZE	-0.2504***	-0.2697***	-0.2727***
	(-3.83)	(-3.39)	(-3.42)
ROA	-1.3647	-1.1854	-1.1876
	(-1.31)	(-1.14)	(-1.14)
TQ	0.0135	0.0083	0.0082
	(0.40)	(0.27)	(0.27)
LEV	-0.0068	-0.0081	-0.0082
	(-1.06)	(-1.20)	(-1.21)
logCASH	-0.0128	-0.0120	-0.0147
	(-0.29)	(-0.22)	(-0.27)
constant	4.6555***	4.1647***	4.2764***
	(9.34)	(-1.22)	(5.33)
Obs.	14,982	14,982	14,982
Year fixed effects	No	Yes	Yes
Industry fixed effects	No	Yes	Yes
Country fixed effects	No	Yes	Yes
R-squared	0.0207	0.0284	0.0284

Notes: ***, **, and * represent the statistical significance at the 1%, 5%, and 10% significance, respectively. The t-statistics is in the parentheses. Column (1) only includes the control variables and presents the baseline regression. Column (2) illustrates the results regarding hypothesis 1, in which the proportion of female directors on the acquiring board is used as the main explanator. Column (3) illustrates the results regarding hypothesis 2, in which having at least three female director on the acquiring board is used as the main explanator.

the deal announcement. The baseline regression in column (1), which only includes the control variables, is performed to set a benchmark. It is found that acquirers with a smaller firm size are associated with a higher CAR. The other controls seem to have no significant effect. However, the effects of some of these variables are likely to be captured by the firm size. By excluding firm size from the regression, the effects of the board size, board independence,

return on assets, and the natural logarithm of the cash holdings all become negatively significant. However, the exclusion of firm size does not affect the main explanators.

Column (2) of Table 4.3 illustrates the main findings of this study. The results show that there is no significant relationship between the proportion of female directors on corporate boards of acquiring firms and the CARs around the announcement date. Therefore, hypothesis 1 has to be rejected. The second hypothesis expects that having at least three female directors on the acquiring board leads to higher M&A performances for acquiring firms. The results in column (3) show that this hypothesis has to be rejected too, since no significant effect is found. This indicates that the critical mass theory does not hold in the case of European M&As. There are several explanations for both of these findings. First of all, it is possible that female directors have adopted the behavior and norms of their male counterparts, which nullifies the possible effect of gender on the M&A performances. A second explanation could be that the market simply does not consider the proportion of female directors when predicting the outcome of certain M&A deals. A third explanation is that over a large number of firms and years, the possible positive, negative, or neutral effect of female directors might be nullified.

Panel A of Table 4.4 displays the results for hypothesis 3, which expects that the effect of gender diversity on acquiring boards on the M&A performances is stronger in countries with a binding gender quota. The main findings are presented in column (2), in which the country fixed effects are excluded from the model to prevent biased results due to a high correlation between the country dummy and the quota variable. Furthermore, in order to ease the interpretation of the main effect of the implementation of a binding quota, the values of the *BDIV* variable are centered. The coefficient of *QUO* illustrates that the implementation of a binding quota law has a significant negative impact on the M&A performances when the gender diversity on the acquiring board is average. The average board gender diversity in the sample is 14.60%, which is rather low compared to the target percentages set by the binding quotas. For boards with an average board gender diversity, the implementation of a quota could have a drastic impact. When the members of these boards were attuned to one another before the implementation of the quota, the mandated adjustments in the board composition could have a negative impact on the M&A performances. Although the new, female board members are likely to be qualified, their assignments could result in increased group conflict and less efficient decision-making. On the other hand, column (2) shows that the coefficient of the interaction term *BDIV*QUO* is positive and significant at the 5% level. This coefficient represents the interaction effect of a binding quota to no binding quota. In other words, the

effect of board gender diversity on M&A performances is significantly more positive in countries with a binding quota. Concluding, hypothesis 3 is accepted.

Table 4.4: Pooled OLS regressions with interaction terms

Dependent variable	**CAR3**			
	Panel A		**Panel B**	
	(1)	**(2)**	**(3)**	**(4)**
BDIV	-0.5560	-0.3561		
	(-1.11)	(-0.83)		
FEM3			0.0372	0.0819
			(0.30)	(0.67)
QUO	-0.2905*	-0.3642**	-0.3090	-0.3323*
	(-1.71)	(-2.33)	(-1.50)	(-1.70)
BDIV*QUO	1.7861**	1.8339**		
	(2.13)	(2.35)		
FEM3*QUO			0.2225	0.2260
			(0.98)	(1.02)
BSIZE	-0.0047	-0.0118	-0.0061	-0.0151
	(-0.30)	(-0.88)	(-0.39)	(-1.12)
BIND	-0.4311*	-0.3019	-0.4345*	-0.3171
	(-1.87)	(-1.43)	(-1.87)	(-1.50)
CDUA	0.2288*	0.1878*	0.2281*	0.1962*
	(1.79)	(1.71)	(1.78)	(1.79)
SIZE	-0.2704***	-0.2640***	-0.2757***	-0.2696***
	(-3.40)	(-3.36)	(-3.44)	(-3.41)
ROA	-1.1830	-1.1863	-1.1881	-1.1958
	(-1.14)	(-1.15)	(-1.14)	(-1.16)
TQ	0.0086	0.0095	0.0081	0.0090
	(0.28)	(0.30)	(0.26)	(0.29)
LEV	-0.0079	-0.0082	-0.0080	-0.0084
	(-1.15)	(-1.22)	(-1.18)	(-1.25)
logCASH	-0.0102	-0.0175	-0.0136	-0.0172
	(-0.19)	(-0.33)	(-0.25)	(-0.32)
constant	4.0975***	4.7162***	4.3007***	4.8612***
	(5.09)	(6.34)	(5.35)	(6.55)
Obs.	14,982	14,982	14,982	14,982
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Country fixed effects	Yes	No	Yes	No
R-squared	0.0288	0.0279	0.0286	0.0277

Notes: ***, **, and * represent the statistical significance at the 1%, 5%, and 10% significance, respectively. The t-statistics is in the parentheses. Panel A illustrates the results regarding hypothesis 3, in which the proportion of female directors on the acquiring board is used as the main explanator. Panel B illustrates the results regarding hypothesis 4, in which the presence at least three female directors on the acquiring board is used as the main explanator.

The results regarding hypothesis 4 are displayed in Panel B of Table 4.4. This hypothesis expects that the effect of having at least three female directors on the acquiring board on the M&A performances is stronger in countries with a binding gender quota. Column (4) illustrates the main findings regarding this hypothesis. For the same reason as in column (2), country fixed effects are excluded. The main effect of a binding quota is significantly negative at the 10% level. This indicates that in case there are not at least three female directors on the board of the acquirer, the implementation of a binding quota has a negative effect on the M&A performances. As explained earlier, this is likely the result of the short-term adjustments firms have to made, which could negatively affect the M&A performances. Finally, the results illustrate that the effect of the presence of at least three female directors on acquiring boards on the M&A performances is not significantly influenced by a binding quota. This indicates that the insights and opinions of these three or more female directors do not count more in countries with a binding quota. However, the insignificant result is not per se surprising. The average board of the firms in the sample has 10 members. That means that firms that have at least three female directors are have a board in which at least 30% of the board members is female. This 30% is already enough according to the targets of the binding quotas in Germany and Portugal and is close to the targets of the binding quotas in Belgium, France, Italy, and Norway. Therefore, it is not surprising that the effect of the interaction term *3FEM*QUO* is insignificant. Concluding, hypothesis 4 has to be rejected.

4.3 Robustness checks

In order to improve the validity and reliability of the results, several additional regressions are performed. First of all, additional regressions are performed in which the highly correlating variables *BSIZE, SIZE,* and *logCASH* are excluded. The results are shown in Tables 10 and 11 in Appendix C. In in Table 10 *BDIV* is used as the main explanator, while in Table 11 *3FEM* is used. Overall, the results in both of these tables do not differ much from the original regressions in Table 4.3 and Table 4.4. Excluding the highly correlating variables does not change the direction of the coefficients and significance of the main explanators. Furthermore, by excluding firm size from the model, the effects of some of the control variables become significant. This is visible in Panel B of both tables. As mentioned before, it is likely that the effects of these variables are captured by the firm size.

Secondly, in order to ensure that extreme outliers do not affect the results, the main analysis is also performed with winsorized variables at the 1st and 99th percentiles. Only the non-dummy variables are winsorized. The results of this winsorized regression are displayed in Table 12 of Appendix C. The direction of the coefficients and the significance of the main explanators are approximately the same as in the main regressions. However, the explanatory power of the winsorized regressions is lower. Therefore, the main regressions are preferred.

Another robustness test is performed in order to ensure that the results do not depend on the event window that is used. In these regressions, a wider event window is used, in which the CARs are measured over eleven days [-5, +5] around the announcement date. The results of these regressions are displayed in Table 13 of Appendix C. As is illustrated in the table, the results are approximately the same as in the main regressions. This indicates that the results found in the original regressions do not depend on the chosen scope of the event window. Additionally, it is found that the average of CAR11 is 0.75%, which again implies that on average, deal announcements have a positive effect on the short-term stock returns of the acquirer.

Finally, there is a possibility that the effects of board characteristics and gender quota laws take some time to appear (Bear et al., 2010). It might take some time for board members to have an impact on the decision-making process and thereby on the M&A performances. The same goes for gender quota laws. When a quota is implemented, firms need some time to adjust their board. As a result, it is possible that the effect of a gender quota law only appears after a year. Additional regressions are performed in which on-year lagged board and quota variables are used. The results of these regressions are displayed in Table 14 of Appendix C. Again, the results are approximately the same as in the main regression.

4.4 Additional regressions

Two additional regressions are performed in which an additional category is added to the *QUO* variable. This variable could now take three different values, namely having no gender quota, a soft quota, or a binding quota. In countries with a soft quota, firms are not mandated to appoint a certain percentage of female directors to their boards, but they are stimulated. Therefore, it is possible that the effect of female directors on the board on M&A performances is stronger in these countries than in countries with no quota. The results of these regressions are shown in Table 15 in Appendix C. In this table the coefficients of the soft and binding quota illustrate the

effect of these laws compared to having no quota. It is found that the implementation of a soft quota does not significantly affect the effect of board gender diversity on M&A performances. The main effect of a soft quota is also insignificant. Two conclusions can be drawn from these findings. First, stimulating firms to increase the number of female directors on their boards, rather than mandating, is not enough to increase the effect of board gender diversity on M&A performance positively. Second, due to the fact that non-complying firms in countries with a soft quota do not get strict sanction, they do not have to adjust their board composition in the short-run. Therefore, the main effect of the soft quota is not significantly negative. With respect to the effect of the presence of at least three female directors, no significant results are found.

4.5 Summary of the findings

To summarize, this study analyzed a dataset of 14,982 European M&A deals from 2003 to 2018. First of all, it is found that 55% of the deals in the sample have resulted in a positive *CAR3* for the acquirer, with an average *CAR3* of 0.84%. Furthermore, 53% of the deals in the sample have resulted in a positive *CAR11* for the acquirer, with an average *CAR11* of 0.75%. These findings are rather controversial, as in the literature it is often claimed that most M&As lead to value losses for the shareholders of the acquirers (e.g. Andrade et al., 2001; Malmendier & Tate, 2008). However, most of these studies focused on US firms. This indicates that the US stock market reactions to M&A deals differ from those in Europe. Concluding, the results of this study indicate that European M&As actually enhance the shareholder value of acquiring firms.

Secondly, the results indicate that the proportion of female directors on the board does not significantly affect the M&A performances of European acquirers. The presence of at least three female directors on the board does also not significantly affect the M&A performances. Moreover, it is found that firms with a high proportion of female directors on the board in have significantly better M&A performances when they are located in a country with a binding gender quota law. However, in case firms have an average percentage of female board directors, the main effect of a binding gender quota law on the M&A performances is found to be negative.

5. Discussion and Conclusion

Discussion

M&As are important strategies for firms seeking growth, a substantial number of takeovers fail to increase the value of acquiring firms. The value-destroying character of M&As is often attributed to the male dominance on corporate boards. Both the resource dependence theory and the agency theory provide arguments that encourage the appointment of more women to the board. On top of that, studies on behavioral differences between men and women suggest that feminine traits contribute positively to the selection of profitable M&As. With the recent implementation of gender quota laws in several European countries, it is interesting to examine the effect of board gender diversity on the M&A performances of European acquirers. Moreover, the effect of the quota's on M&A performances is also worth having a look at. By performing several multi-level regressions, this study finds that board gender diversity does not have a significant effect on the M&A performances of European acquirers. The presence of at least three female directors on the board has no significant effect on the M&A performances either. Finally, it is found that the effect of board gender diversity on M&A performances is significantly more positive in countries with a binding gender quota law. Additional robustness checks support these findings.

Since no significant relationship is found for hypotheses 1 and 2, it is important to emphasize what is not found. First, this study did not find a negative relationship between board gender diversity and M&A performance. Thus, the results do not impede the pursuit of gender equality in organizations. Second, these findings may indicate that the input of the board of directors is less important than expected for M&A performances. According to Hirt et al. (2016), this is due to the fact that many boards discuss their strategy only once a year. Often, there is not enough time for discussion and in-depth information on the strategy. Instead, boards should take enough time to consider multiple strategies, with different levels of resources and risks. This is also relevant for the M&A-related decisions.

Regarding the effect of gender quota laws, this study did find a significant interaction term. It is found that the effect of the proportion of female directors on M&A performances is significantly more positive in countries with a binding gender quota law. Moreover, the results of the additional analysis indicate that the effect of board gender diversity on M&A

performances does not significantly differ between countries with a soft gender quota law and no gender quota law.

This study makes several contributions to the literature. First of all, this study is among the first to examine the effect of board gender diversity on M&A performances. Whereas most studies examine the effect of gender on the bid premium or acquisitiveness of acquiring firms (e.g. Bazel-Shoham et al., 2020; Levi et al., 2014), this study examines the gender effect on the CARs. Levi et al., (2008) did a similar study, but focused on US firms. Their results are mainly the same as in this study. Although they found a significant positive effect of the target's board gender diversity on the M&A performances of the acquirer, they failed to find a similar significant relationship for the acquirer's board gender diversity. Secondly, by distinguishing between binding and non-binding gender quota laws, this study contributes to the understanding of the effects of different sorts of action programs. These insights are useful for regulators and policy makers. Lastly, this study contributes to the scarce literature on the effect of gender on M&A performances in Europe.

This study is also subject to a number of limitations. First of all, the CARs are obtained by performing an event study, which rests on several assumptions. For instance, it is assumed that the market immediately react in case of a deal announcement. However, when markets are inefficient, the stock returns do not completely and immediately reflect all information. Moreover, in some cases the abnormal returns spread out over a longer period, which complicates the finding of the real effect of the event (Woon, 2004). Another limitation regarding the use of an event study is the variation in the estimation and event window. Since each specific case deals with unique external factors, it is hard to determine one general estimation and event window for all cases.

The second limitation concerns the implementation of gender quota laws. Although lagged variables are used, the effect of gender quota laws might take even longer than a year to appear. A reasonable argument is that firms need time to find the right, qualified female board members. However, due to the fact that most of these quota's are only implemented recently, it is hard to look at the effect over a period of five or ten years. Another limitation concerns the implementation of the soft gender quota laws. These laws differ a lot between countries, which raises the question if these soft laws can be captured by one category, like in the additional analysis. This could bias the results of the interaction effect in the additional analysis.

Finally, several recommendations for future research are made. First of all, because of the concerns about the impact of tokenism, it would be interesting to examine whether the effect

of board gender diversity on M&A performances differs between qualified and non-qualified female directors, for instance by looking at their educational background. Another interesting distinction could be made between dependent and independent female directors. Independence might strengthens the possible gender effect, which might result in significant results. Lastly, it would be interesting to analyze a data sample that included both European and US firms, and maybe even Asian firms. Such a study might find interesting results regarding the effect of gender quota's, which is still considered as something European.

Conclusion

The main focus of this study is to examine the effect of board gender diversity on the M&A performances of European acquirers. From an resource dependence theory and agency theory perspective, this effect is expected to be positive. However, there are also reasonable theoretical explanations which suggest either a negative effect or no effect at all. In times of an increasing interest in gender equality both in society and organizations, the understanding of gender effect on corporate performances could guide shareholders, boards, and policy makers in their decisions-making process. After examining 14,982 M&A deals from 2,579 listed European firms from 2003 to 2018, it is found that there is no significant relationship between board gender diversity and M&A performance. On top of that, it is found that the effect of the proportion of female directors on M&A performances is more positive in countries with a binding gender quota law.

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Appendices

Appendix A: Additional descriptive statistics

Table 7: Averages of the main variables per country

Country	Obs.	CAR3	BDIV	FEM3
Austria	222	-0.0105	8.83%	15.77%
Belgium	322	0.0758	16.42%	32.61%
Denmark	143	0.5337	16.22%	28.67%
Faroe Islands	3	-0.9211	18.89%	0.00%
Finland	335	0.4864	24.28%	31.94%
France	2,355	0.5461	20.87%	41.91%
Germany	1,310	0.4915	11.51%	30.92%
Greece	24	0.1119	6.77%	0.00%
Iceland	25	-0.1557	23.89%	16.00%
Ireland	565	0.8689	16.35%	31.86%
Italy	377	0.5445	16.60%	37.93%
Luxembourg	84	0.5124	6.42%	11.90%
Malta	20	-0.3374	22.08%	0.00%
Monaco	1	0.0482	10.00%	0.00%
Netherlands	782	0.6639	9.51%	9.34%
Norway	330	0.8033	33.97%	55.15%
Portugal	73	0.9536	8.19%	8.22%
Russia	1	0.9309	4.76%	0.00%
Spain	414	0.5114	13.47%	28.99%
Sweden	1,078	0.7793	27.46%	45.64%
Switzerland	828	0.5908	10.74%	5.56%
Turkey	1	-9.495	42.86%	100.00%
United Kingdom	5,689	1.2411	9.87%	6.87%

Appendix B: Correlation matrices

TABLE 8: Correlation matrix of the explanators with BDIV as the main explanator

	BDIV	QUO	BDIV*QUO	BSIZE	BIND	CDUA	SIZE	ROA	TQ	LEV	CASH
BDIV	1.0000										
QUO	0.4077	1.0000									
BDIV*QUO	0.5754	0.6374	1.0000								
BSIZE	0.0906	0.1451	0.1103	1.0000							
BIND	0.2382	-0.0442	0.0455	-0.0768	1.0000						
CDUA	-0.0405	0.2158	0.1001	0.2522	-0.1644	1.0000					
SIZE	0.2479	0.1171	0.1435	0.5983	0.2798	0.1532	1.0000				
ROA	0.0674	-0.0215	0.0031	0.0263	0.0953	-0.0045	0.2067	1.0000			
TQ	0.0203	-0.0298	-0.0214	-0.0327	0.0178	-0.0225	-0.0352	0.0330	1.0000		
LEV	0.0066	-0.0027	0.0014	0.0733	0.0023	-0.0061	0.0748	-0.0298	-0.0233	1.0000	
logCASH	0.2548	0.1656	0.1679	0.6062	0.2666	0.1826	0.8366	0.1181	-0.0212	0.0517	1.0000

TABLE 9: Correlation matrix of the explanators with 3FEM as the main explanator

	3FEM	QUO	3FEM*QUO	BSIZE	BIND	CDUA	SIZE	ROA	TQ	LEV	CASH
3FEM	1.0000										
QUO	0.4075	1.0000									
3FEM*QUO	0.6276	0.7430	1.0000								
BSIZE	0.3435	0.1451	0.2411	1.0000							
BIND	0.1229	-0.0442	0.0249	-0.0768	1.0000						
CDUA	0.0866	0.2158	0.1561	0.2522	-0.1644	1.0000					
SIZE	0.3441	0.1171	0.2162	0.5983	0.2798	0.1532	1.0000				
ROA	0.0471	-0.0215	-0.0009	0.0263	0.0953	-0.0045	0.2067	1.0000			
TQ	0.0033	-0.0298	-0.0248	-0.0327	0.0178	-0.0225	-0.0352	0.0330	1.0000		
LEV	0.0206	-0.0027	0.0046	0.0733	0.0023	-0.0061	0.0748	-0.0298	-0.0233	1.0000	
logCASH	0.3583	0.1656	0.2384	0.6062	0.2666	0.1826	0.8366	0.1181	-0.0212	0.0517	1.0000

Appendix C: Robustness tests

Table 10: Robustness test with the exclusion of highly correlating variables

Dependent variable	CAR3					
	Panel A		Panel B		Panel C	
	(1)	(2)	(3)	(4)	(5)	(6)
BDIV	-0.2067	-0.3466	-0.4335	-0.6724	-0.2159	-0.3619
	(-0.48)	(-0.81)	(-0.96)	(-1.50)	(-0.50)	(-0.85)
QUO		-0.3699**		-0.6029**		-0.3680**
		(-2.37)		(-2.21)		(-2.37)
BDIV*QUO		1.8300**		1.9298**		1.8338**
		(2.34)		(2.49)		(2.34)
BSIZE			-0.0291**	-0.0360***	-0.0033	-0.0129
			(-2.16)	(-2.98)	(-0.20)	(-0.90)
BIND	-0.4247*	-0.2506	-0.6444***	-0.5243**	-0.4416*	-0.3131
	(-1.89)	(-1.28)	(-2.76)	(-2.50)	(-1.89)	(-1.45)
CDUA	0.2223*	0.1796	0.2269*	0.1767	0.2222*	0.1841*
	(1.74)	(1.63)	(1.76)	(1.61)	(1.74)	(1.66)
SIZE	-0.2717***	-0.2742***			-0.2786***	-0.2777***
	(-3.67)	(-3.73)			(-5.48)	(-5.67)
ROA	-1.1795	-1.1585	-1.1790	-1.7018	-1.1779	-1.1744
	(-1.13)	(-1.12)	(-1.61)	(-1.60)	(-1.13)	(-1.13)
TQ	0.0083	0.0094	0.0112	0.0126	0.0083	0.0093
	(0.27)	(0.30)	(0.35)	(0.39)	(-0.27)	(0.30)
LEV	-0.0082	-0.0084	-0.0115*	-0.0117*	-0.0080	-0.0080
	(-1.20)	(-1.24)	(-1.80)	(-1.85)	(-1.18)	(-1.19)
logCASH	-0.0131	-0.0234	-0.1816***	-0.1873***		
	(-0.23)	(-0.43)	(-5.70)	(-6.27)		
constant	4.1677***	4.7893***	2.7499***	3.2447***	4.1697***	4.7369***
	(5.28)	(6.68)	(4.00)	(5.85)	(5.31)	(6.60)
Obs.	14,982	14,982	14,982	14,982	14,982	14,982
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	No	Yes	No	Yes	No
R-squared	0.0284	0.0278	0.0252	0.0248	0.0284	0.0279

Notes: ***, **, and * represent the statistical significance at the 1%, 5%, and 10% significance, respectively. The t-statistics is in the parentheses. Panel A illustrates the results of the regression in which the board size variable is excluded. Panel B illustrates the results of the regressions in which the firm size variable is excluded. Panel C illustrates the results of the regressions in which the variable of the logarithm of the cash holdings is excluded.

Table 11: Robustness test with the exclusion of highly correlating variables

Dependent variable	CAR3					
	Panel A		Panel B		Panel C	
	(1)	(2)	(3)	(4)	(5)	(6)
3FEM	0.0632	0.0562	0.0165	0.0149	0.0671	0.0789
	(0.55)	(0.46)	(0.14)	(0.12)	(0.59)	(0.65)
QUO		-0.3245*		-0.2744		-0.3383*
		(-1.65)		(-1.42)		(-1.75)
3FEM*QUO		0.2158		0.1954		0.2303
		(0.97)		(0.88)		(1.04)
BSIZE			-0.0300**	-0.0381***	-0.0050	-0.0162
			(-2.16)	(-3.03)	(-0.30)	(-1.13)
BIND	-0.4248*	-0.2502	-0.6572***	-0.5565***	-0.4480*	-0.3282
	(-1.89)	(-1.29)	(-2.81)	(-2.64)	(-1.92)	(-1.52)
CDUA	0.2222*	0.1845*	0.2298*	0.1906*	0.2221*	0.1926*
	(1.74)	(1.68)	(1.78)	(1.73)	(1.74)	(1.74)
SIZE	-0.2758***	-0.2813***			-0.2837***	-0.2831***
	(-3.68)	(-3.75)			(-5.55)	(-5.77)
ROA	-1.1785	-1.1609	-1.7317	-1.7312	-1.1785	-1.1842
	(-1.13)	(-1.12)	(-1.62)	(-1.62)	(-1.13)	(-1.14)
TQ	0.0082	0.0089	0.0109	0.0121	0.0081	0.0088
	(0.27)	(0.29)	(0.34)	(0.37)	(0.26)	(0.29)
LEV	-0.0083	-0.0086	-0.0117*	-0.0121*	-0.0080	-0.0082
	(-1.22)	(-1.28)	(-1.83)	(-1.92)	(-1.19)	(-1.22)
logCASH	-0.0163	-0.0243	-0.1871*	-0.1921***		
	(-0.29)	(-0.45)	(-5.92)	(-6.45)		
constant	4.2746***	4.9280***	2.8457***	3.3979***	4.2821***	4.8823***
	(5.32)	(6.79)	(4.12)	(5.91)	(5.39)	(6.85)
Obs.	14,982	14,982	14,982	14,982	14,982	14,982
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	No	Yes	No	Yes	No
R-squared	0.0284	0.0276	0.0251	0.0244	0.0284	0.0277

Notes: ***, **, and * represent the statistical significance at the 1%, 5%, and 10% significance, respectively. The t-statistics is in the parentheses. Panel A illustrates the results of the regression in which the board size variable is excluded. Panel B illustrates the results of the regressions in which the firm size variable is excluded. Panel C illustrates the results of the regressions in which the variable of the logarithm of the cash holdings is excluded.

Table 12: Robustness test with winsorized variables

Dependent variable	CAR3			
	Panel A		Panel B	
	(1)	(2)	(3)	(4)
BDIV	-0.2566	-0.4152		
	(-0.68)	(-1.10)		
FEM3			0.0440	0.0330
			(0.43)	(0.30)
QUO		-0.4385*		-0.2383
		(-1.72)		(-1.43)
BDIV*QUO		1.3912*		
		(1.90)		
FEM3*QUO				0.2022
				(1.00)
BSIZE	-0.0045	-0.0123	-0.0057	-0.0144
	(-0.36)	(-1.10)	(-0.44)	(-1.27)
BIND	-0.3198*	-0.2323	-0.3254*	-0.2514
	(-1.72)	(-1.35)	(-1.74)	(1.45)
CDUA	0.1109	0.0994	0.1119	0.1093
	(1.15)	(1.16)	(1.16)	(1.28)
SIZE	-0.2124***	-0.2066***	-0.2154***	-0.2126***
	(-4.80)	(-4.76)	(-4.87)	(-4.88)
ROA	0.0409	-0.0033	0.0354	-0.0131
	(0.05)	(-0.00)	(0.04)	(-0.02)
TQ	0.0003	0.0130	-0.0007	0.0090
	(0.00)	(0.21)	(-0.01)	(0.15)
LEV	-0.0002	0.0003	0.0001	-0.0008
	(-0.01)	(0.01)	(0.00)	(-0.02)
logCASH	-0.0367	-0.0400	-0.0392	-0.0394
	(-0.96)	(-1.10)	(-1.03)	(-1.08)
constant	3.7471***	4.2060***	3.8497***	4.3585***
	(5.47)	(7.02)	(5.61)	(7.39)
Obs.	14,982	14,982	14,982	14,982
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Country fixed effects	Yes	No	Yes	No
R-squared	0.0284	0.0276	0.206	0.0197

Notes: ***, **, and * represent the statistical significance at the 1%, 5%, and 10% significance, respectively. The t-statistics is in the parentheses. Panel A illustrates the results regarding hypothesis 3, in which the proportion of female directors on the acquiring board is used as the main explanator. Panel B illustrates the results regarding hypothesis 4, in which the presence at least three female directors on the acquiring board is used as the main explanator.

Table 13: Robustness test with a wider event window

Dependent variable	CAR11			
	Panel A		Panel B	
	(1)	(2)	(3)	(4)
BDIV	0.3891	-0.3019		
	(0.62)	(-0.49)		
FEM3			0.2506	0.1193
			(1.35)	(0.60)
QUO		-0.6470		-0.2441
		(-1.11)		(-0.79)
BDIV*QUO		2.6731**		
		(2.38)		
FEM3*QUO				0.4327
				(1.21)
BSIZE	-0.0074	-0.0216	-0.0130	-0.0275
	(-0.40)	(-1.28)	(-0.68)	(-1.59)
BIND	-0.3128	-0.1773	-0.3011	-0.1911
	(-0.99)	(-0.61)	(-0.95)	(-0.66)
CDUA	0.1077	0.0943	0.0989	0.1019
	(0.65)	(0.64)	(0.59)	(0.69)
SIZE	-0.2423***	-0.2424***	-0.2441***	-0.2490***
	(-2.84)	(-2.85)	(-2.85)	(-2.92)
ROA	-1.4355	-1.4302	-1.4295	-1.4378
	(1.14)	(-1.14)	(-1.13)	(-1.14)
TQ	0.118	0.0141	0.1186	0.0136
	(0.33)	(0.39)	(0.34)	(0.38)
LEV	-0.0058	-0.0059	-0.0059	-0.0061
	(-0.54)	(-0.56)	(-0.54)	(-0.58)
logCASH	-0.0603	-0.0507	-0.0625	-0.0493
	(-0.94)	(-0.81)	(-0.97)	(-0.79)
constant	3.3347**	3.8536**	3.4734***	4.0175***
	(2.56)	(3.16)	(2.65)	(3.25)
Obs.	14,982	14,982	14,982	14,982
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Country fixed effects	Yes	No	Yes	No
R-squared	0.0205	0.0199	0.0206	0.0197

Notes: ***, **, and * represent the statistical significance at the 1%, 5%, and 10% significance, respectively. The t-statistics is in the parentheses. Panel A illustrates the results regarding hypothesis 3, in which the proportion of female directors on the acquiring board is used as the main explanator. Panel B illustrates the results regarding hypothesis 4, in which the presence at least three female directors on the acquiring board is used as the main explanator.

Table 14: Robustness test with lagged board and quota variables

Dependent variable	CAR11			
	Panel A		Panel B	
	(1)	(2)	(3)	(4)
L.BDIV	-0.3059	-0.6238		
	(-0.67)	(-1.40)		
L.FEM3			-0.1009	-0.1187
			(-0.86)	(-0.95)
L.QUO		-0.4286***		-0.3286*
		(-2.68)		(-1.68)
L.BDIV*L.QUO		2.3550***		
		(2.68)		
L.FEM3*L.QUO				0.2892
				(1.25)
L.BSIZE	-0.0112	-0.0175	-0.0091	-0.0168
	(-0.82)	(1.43)	(-0.67)	(-1.36)
L.BIND	-0.4899**	-0.3271	-0.4942**	-0.3342
	(-2.01)	(-1.46)	(-2.02)	(-1.50)
L.CDUA	0.1813	0.1695	0.1868	0.1786
	(1.39)	(1.52)	(1.44)	(1.61)
SIZE	-0.3059***	-0.3024***	-0.3060***	-0.3053***
	(-3.39)	(-3.39)	(-3.38)	(-3.41)
ROA	-1.4127	-1.4252	-1.4196	-1.4308
	(-1.15)	(-1.17)	(-1.16)	(-1.18)
TQ	0.0123	0.0133	0.0123	0.0128
	(0.37)	(0.39)	(0.37)	(-0.38)
LEV	-0.0074	-0.0074	-0.0074	-0.0074
	(-1.12)	(-1.12)	(-1.12)	(-1.13)
logCASH	0.0269	0.0195	0.0266	0.0205
	(0.43)	(0.33)	(0.43)	(0.34)
constant	4.0137***	4.5457***	3.9925***	4.6211***
	(4.62)	(5.60)	(4.57)	(5.71)
Obs.	13,604	13,604	13,604	13,604
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Country fixed effects	Yes	No	Yes	No
R-squared	0.0301	0.0297	0.0301	0.0293

Notes: ***, **, and * represent the statistical significance at the 1%, 5%, and 10% significance, respectively. The t-statistics is in the parentheses. Panel A illustrates the results regarding hypothesis 3, in which the proportion of female directors on the acquiring board is used as the main explanator. Panel B illustrates the results regarding hypothesis 4, in which the presence at least three female directors on the acquiring board is used as the main explanator.

Table 15: Additional regression with three quota categories

Dependent variable	CAR3	
	(2)	(5)
BDIV	-0.0775	
	(-0.11)	
FEM3		0.1225
		(0.67)
QUO		
Soft	0.1615	0.1617
	(1.05)	(1.00)
Binding	-0.2458*	-0.2180
	(-1.21)	(-0.95)
BDIV*QUO		
Soft	-0.5998	
	(-0.69)	
Binding	1.5682*	
	(1.65)	
FEM3*QUO		
Soft		-0.0792
		(-0.37)
Binding		0.1991
		(0.76)
BSIZE	-0.0128	-0.0161
	(-0.95)	(-1.19)
BIND	-0.3058	-0.3271
	(-1.44)	(-1.55)
CDUA	0.1806	0.1924*
	(1.64)	(1.75)
SIZE	-0.2630***	-0.2700***
	(-3.36)	(-3.42)
ROA	-1.1823	-1.1979
	(-1.14)	(-1.16)
TQ	0.0094	0.0090
	(0.30)	(0.29)
LEV	-0.0081	-0.0083
	(-1.21)	(-1.24)
logCASH	-0.0162	-0.1532
	(-0.30)	(-0.29)
constant	4.7284***	4.8567***
	(6.35)	(6.54)
Obs.	14,982	14,982
Year fixed effects	Yes	Yes
Industry fixed effects	Yes	Yes
Country fixed effects	No	No
R-squared	0.0280	0.0286

Notes: ***, **, and * represent the statistical significance at the 1%, 5%, and 10% significance, respectively. The t-statistics is in the parentheses. Panel A illustrates the results regarding hypothesis 1, in which the proportion of female directors on the acquiring board is used as the main explanator. Panel B illustrates the results regarding hypothesis 2, in which having at least three female directors on the acquiring board is used as the main explanator. In columns (1), (2), (4), and (5), a distinction is made between three levels of gender quota's: no quota, a soft quota, and a binding quota. Columns (3) and (6) present the results of the effects of a binding quota compared to having no quota or a soft quota.