The Impact of Institutional Investors on Cross-border Mergers and Acquisitions in Europe

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Abstract

Due to their resources and power, institutional investors play an important role in affecting corporate strategy and governance. Mergers or acquisitions are among the most important decisions firms face in their existence, and may affect future growth and shareholder value considerably. In this paper I therefore explore the effects of institutional investors on M&A engagement by applying a probit model. Total institutional ownership does not seem to influence the decision to engage in a cross-border or domestic M&A. However, when I examine the country of origin of institutional investors and ownership concentration, I find that foreign institutional investors increase the probability of a cross-border M&A, but I find no evidence for an association between block institutional ownership and the choice of a domestic or cross-border M&A.

Keywords:
Institutional Investors, Shareholder Activism, Mergers and Acquisitions, Cross-Border, Euro Area

Contents

1 Introduction

As the global economy revived from the largest financial crisis in decades, merger and acquisition (M&A) activity flourished in the 2010s. This decade counted 464,439 M&A transactions worldwide, an increase of 25% compared to the 10 years before. Including several mega deals, such as that of pharmaceutical firm Bristol-Myers Squibb buying rival Celgene for $93bn in 2018, the aggregate value totaled $34.3 trillion (Kelleher, 2019). This period was characterized by strong economic growth, cheap cost of debt, and fear of disruption by tech giants, which resulted in companies trying to retain and expand their dominance by engaging in sizable deals (Massoudi, Fontanella-Khan, & Platt, 2019).

At the same time, institutional investors have firmly increased their holdings in firms over the years (Derrien, Kecsk's, & Thesmar, 2013). Carrubba et al. (2019) state that institutional investor's assets under management covered a value of $74.3 trillion in 2018. Considering these sizable investments, institutional investors can be regarded as essential actors in current global financial markets. Moreover, due to their resources and power, institutional investors play an important role in affecting corporate strategy and governance (Brooks, Chen, & Zeng, 2018; McCahery, Sautner, & Starks, 2016). Mergers or acquisitions are among the most important decisions firms face in their existence, and may affect future growth and shareholder value considerably. In this thesis I therefore explore the effects of institutional investors on M&A engagement.

The financial literature has recently discussed institutional investors and M&As in a variety of contexts. My research is closely related to the papers that examine institutional investors at the acquirer side and their effects on cross-border M&A engagement. Ferreira, Massa, and Matos (2010) study institutional investors and M&As in a large global sample, while Andriosopoulos and Yang (2015) have a more specific context in their study on the United Kingdom. I am able to contribute to this literature by studying a similar topic, but focusing instead on the euro area. The unifying policy of the European Union has resulted in macroeconomic stability, increased trade, and financial integration for its participating countries (Juncker, Tusk, Dijsselbloem, Draghi, & Schulz, 2015). Given this fact, it is interesting to examine whether this has resulted in increased cross-border M&A deals for acquirers from this region.

Therefore, I address the following research question: "What is the impact of institutional investors on cross-border merger and acquisition engagement in Europe?"

The study of institutional investors and M&As yields important implications for managers. First of all, it reveals the extent to which institutional investors can affect strategic corporate decisions. Institutional investors who monitor have the capability to affect management decisions immediately and they can gather superior information at first hand (Chen, Harford, & Li, 2007). Research on institutional investors and M&A engagement provides managers with the knowledge to anticipate on future strategic decisions. Furthermore, it shows how foreign institutional investors can affect internationalisation of their target firms. Expansion through cross-border M&As provides firms with synergies as a result of exploitation of tax differences and market inefficiency opportunities (Scholes, Wilson, & Wolfson, 1990; Servaes & Zenner, 1994). In addition, the governance of both acquirer and target improves by spillovers of corporate governance codes between them (Martynova & Renneboog, 2008). Overall, my research is able to aid managers by providing insights how foreign institutional investors can affect firm governance and strategy by facilitating cross-border M&As.

In order to examine whether there is a link between institutional investors and the probability of a cross-border M&A deal I use a generalized linear model in the form of a probit regression. I also control for several firm-specific and deal-specific effects.

My dataset consists of M&A deals undertaken by acquiring firms in the euro area and their corresponding institutional ownership levels in the year before the M&A. The time-window starts at January 2010 and ends at December 2019. The sizable number of countries provides a rich geographical picture of institutional ownership and M&A engagement. Moreover, Europe is an excellent setting for researching the engagement of institutional investors in M&A choices, as there is an extensive number of firms that are closely held and a broad spectrum of capital markets, regulations, and institutional settings (Faccio & Masulis, 2005).

I find no significant relationship between total institutional ownership and cross-border M&As. When I delve deeper into institutional investors by considering their country of origin, I find that foreign institutional investors increase the probability of a cross-border M&A. However, I find no evidence

for an association between block institutional ownership and the choice of a domestic or cross-border M&A. My results suggest that rather the country of origin of the institutional investors is of importance, as there is a substantial difference between foreign institutional investors and domestic institutional investors. In addition, I find that institutional investors have more impact on engagement in cross-border M&As through larger deals. Finally, in a north-south euro area analysis I find that in the northern countries institutional investors have a positive effect on engagement in cross-border M&As, while for the southern countries this effect is the opposite.

This thesis is structured as follows. Chapter 2 provides a literature review on the underlying theories and empirical evidence of institutional investors and M&As. Chapter 3 details empirical approaches to measure the impact of institutional investors on M&A engagement. Chapter 4 explores M&A and institutional ownership distributions and provides descriptive statistics. Chapter 5 presents the results and chapter 6 concludes.

2 Literature Review

This chapter lays out a theoretical foundation for the impact of institutional investors on M&As. First, I introduce institutional investors and explain their importance for firms and financial markets. After having described the underlying theories that can explain the impact of institutional investors on firm decisions, I show several empirical findings of the impact of institutional investors on various firm decisions and the motives behind it. Subsequently, I describe M&As and their various aspects, followed by the empirical evidence of institutional investors and their impact on M&As. The chapter is finalized with the hypotheses.

2.1 Institutional Investors

Institutional investors play an important role in the global financial markets. Institutional investors can be defined as specialized financial organisations that serve as financial intermediaries; they provide individuals the option to participate in pooled investment instruments without directly engaging in capital markets. Among a variety of institutional investors the most prominent include pension funds, hedge funds, mutual funds, banks, and insurance companies. Institutional investors have rapidly grown in size the last decades and are therefore able to buy large blocks of a target firm's stock. Borochin and Yang (2017) state that since the 1980s, the average shareholdings by institutional investors has risen from approximately 20% to more than 65% in the 2010s.

Institutional investors possess the ability to exert substantial influence over their investments, given their sizable positions in each large firm. Moreover, institutional investors have superior financial resources and information advantages. As a consequence, they are capable to effectively monitor the firm's top management (Ryan & Schneider, 2003). In addition, institutional investors can express their disapproval with corporate decisions through several forms of shareholder activism, for example by using their voting rights (Goranova & Ryan, 2014). The majority of activities on monitoring and activism relate to corporate governance and strategic operations, such as the composition of the board of directors, growth strategies and investments (Gillan & Starks, 2003). Ferreira and Matos (2008) argue that, due to their effective monitoring and activism, the presence of independent institutional investors results in an increase in firm valuation.

However, as each type of institutional investor targets specific investor clienteles with specific preferences, their characteristics and investment objectives differ considerably. Although academics widely agree that institutional investors can exert their influence over a firm's management through monitoring and activism, the extent to which this occurs may vary between each type of investor. Borochin and Yang (2017) find that different types of institutional investors have varying implications for corporate governance and firm valuation. This is in line with Chen et al. (2007) and Ferreira and Matos (2008), who divide institutional investors in independent institutions and grey institutions. Independent institutions, such as mutual funds and pension funds, have less relationships with firm management to threaten and are thus able to effectively exert influence. In contrast, grey institutions, such as banks and insurance companies, are likely to be loyal to the firm's management and will exert less pressure.

Further, institutional investors can be divided in short-term and long-term investors. Institutional investors have different investment horizons for a variety of reasons. For example, due to their resources and capabilities, institutional investors can influence management decisions and benefit from these monitoring activities in the long term (Gaspar, Massa, & Matos, 2005). Edelen (1999) argues that demographics and liquidity needs can be a foundation for strategies with different horizons. For instance, employee-defined contributions plans are frequently long-term oriented, while mutual funds are usually short-term oriented since money flows in and out frequently. A difference in investment horizon may also stem from agency problems. Institutional investors may find it hard to continuously acquire capital to carry out long-term strategies, which results in a short-term horizon (Shleifer & Vishny, 1997). In addition, short-term trade signals may influence investors to be more short-term oriented (Dow & Gorton, 1997).

Institutional investors can also be divided in foreign and domestic. Due to globalization institutional investors can increasingly invest in firms around the world. Therefore, foreign investments have played a considerable role in boosting economic growth in emerging markets (Aggarwal, Klapper, & Wysocki, 2005). Foreign institutional investors often have superior financial resources and capabilities to monitor managers (Gillan & Starks, 2003). On the other hand, domestic institutional investors are more likely to have ties to local management and to have access to private information (Choe, Kho, &

Stulz, 2001).

Finally, Fichtner, Heemskerk, and Garcia-Bernardo (2017) argue that since the Great Recession of 2008 a new trend has emerged, whereby institutional investors relocated their capital from costly, actively managed funds to inexpensive, passively managed index funds and exchange traded funds. Both investment funds seek to track an index, thereby minimizing transaction and management costs. This indicates that some institutional investors may prefer passive investment strategies over costly and time-consuming monitoring processes.

2.2 Theories Related to the Impact of Institutional Investors on Firm Management Decisions

In this section I explain the agency theory, resource-based theory and institutional theory. Considering these perspectives yields a thorough understanding of the impact of institutional investors on various firm management decisions.

2.2.1 Agency Theory

In modern institutional environment large shareholders increasingly wield their influence on a firm's management, as the incentives of both parties are often not aligned (Denes, Karpoff, & McWilliams, 2017). The origin of this conflict of interest lies in the structure of the corporate firm, where the separation between ownership and control causes friction between decision and risk-bearing activities (Fama & Jensen, 1983).

In their influential work on the agency relationship and ownership structure, Jensen and Meckling (1976) argue that the separation between ownership and control leads to agency costs. They refer to the agency relationship as a contract in which one person, the principal, employs another person, the agent, to be involved in decision-making on behalf of them. However, when the shareholders contract a manager to take control of a firm, and both parties try to maximize their utility, it is reasonable to expect that the manager will not always behave in the interest of the shareholders. As a consequence, shareholders must create incentives for the manager to let their interests align, and incur monitoring costs to prevent undesirable behavior of the manager. However, monitoring is costly and difficult, and not every circumstance can be taken into account, so it may be difficult to reduce information asymmetry

(Eisenhardt, 1989). Clifford (2008) argues that an increase of agency problems can lead to poorer firm performance and a decrease in shareholder value.

Friction in the agency relationship may have several causes. Lambert (2001) describes four common rationales for a conflict between the agent and the principal: (i) there is a probability of reluctance to make an effort by the agent (e.g. a manager may have no appetite to complete his work with full effort), (ii) the agent may utilize his labor situation as an opportunity to shift resources to his own interest, (iii) there can be a difference in time horizons i.e., while the shareholder may focus on the long term benefits of their principal-agent relationship, the manager might act only with the near future in his mind, (iv) the principal and the agent may have a different perspective of risks being held.

Institutional investors can reduce agency problems in the principal-agent conflict, as argued by Becht, Polo, and Rossi (2016). They explain that institutions often have considerable financial resources and expertise to monitor management and exert their influence on strategic decisions that are not aligned with their interests. Gaspar et al. (2005) and Chen et al. (2007) show that the monitoring of long-term institutional investors reduces agency conflicts between managers and shareholders. The presence of long-term institutional investors results in significantly higher announcement returns, long-term stock returns, and long-term firm performance. However, while most of the institutional investors focus on the long term, some institutional investors have only short-term profit in mind. Kim, Kim, and Mantecon (2019) find that short-term institutional owners increase the agency problems between shareholders and other stakeholders of the firm. They argue that short-term investors force firm managers to take nearsighted decisions at the expense of long-term benefits.

2.2.2 Resource-Based Theory

The resource-based theory suggests that firms are able to create and sustain competitive advantages through the possession of heterogeneous resources that are valuable, rare, inimitable, and unsubstitutable. Firm resources encompass capabilities, information, knowledge, internal processes, or other intangible assets. Due to these resources, firms are able to realize strategies that improve efficiency and effectiveness (Barney, 1991). Fernandez and Nieto (2006) state

that the resource endowment of firms is related to their ownership types. In the latter decades of the 20th century institutional investors have emerged as the dominant shareholder class. Consequently, institutional investors are able to contribute to the success of a firm, as they can provide valuable resources such as information, financial capital, and managerial capabilities that generate competitive advantages (Fernandez & Nieto, 2006; George, Wiklund, & Zahra, 2005). However, it can be argued that there exists heterogeneity among institutional investors. In case of euro area firms these differences mainly come from institutional investors being foreign or domestic.

Compared to other investors, domestic institutional investors possess superior informational advantages because information then does not have to deal with physical, linguistic, or cultural distances (Dvořák, 2005). Choe et al. (2001) argue that due to their home bias, domestic institutional investors are more likely to have access to private information. Particularly in countries where is a higher degree of insider trading this private information is important. Ferreira, Matos, Pereira, and Pires (2017) find that domestic institutional investors bring advantages in regions that have less efficient stock markets, inadequate investor protection, and in regions with more corruption. Moreover, in times of uncertainty the advantage is relatively higher.

While it is often argued that foreign institutional investors have information disadvantages due to physical, linguistic and cultural differences, Dvořák (2005) argues that foreign institutional investors may also have information advantages due to their superior capabilities and financial resources. Moreover, foreign institutional investors have features that are substantially different from their domestic counterparts. Gillan and Starks (2003) argue that foreign institutional investors are independent from local management, hold global diversified portfolios, and have expertise in monitoring firms. Therefore, they are able to intervene actively and encourage managers to engage in long-term value-increasing investments.

2.2.3 Institutional Theory

Institutional investors are exposed to certain rules and regulations which they have to comply with. According to Davis, Desai, and Francis (2000), institutional theory suggests that organisations find their meaning in improving or protecting their legitimacy in a certain institutional environment. Organisa-

tions are ingrained within this institutional environment, and their behavior tends to be in harmony with the universal norms, regulations, expectations and institutional rules set by institutions and stakeholders. More specifically, the strategic practises and outcomes of organisations are subject to social pressure from the institutional environment. So, in order to survive and succeed, they have to gain legitimacy by harmonizing with requirements from the institutional environment (Dacin, Oliver, & Roy, 2007; Kostova, Roth, & Dacin, 2008). As a result, organisations change their behavior in order to conform to the expectations of the institutional environment, a process referred to as institutionalization (Slack & Hinings, 1994).

Institutional investors are increasingly expected to influence corporate governance. However, the extent to which institutional investors can have an impact may be affected by the institutional context in which they act and depends on the shareholder rights of the country in which they operate. Antoniou, Guney, and Paudyal (2008) argue that institutional investors use the money of others to invest and are therefore controlled by regulations in each country. Moreover, active ownership regulations have been tightened in a large number of countries since the financial crisis (McNulty & Nordberg, 2016). Since institutional investors tend to act by these regulations, their behavior has to be interpreted in the context of the financial system and institutions of a country (Antoniou et al., 2008). In addition, the extent to which institutional investors can have impact depends on the shareholder rights within a country. The euro area consists of relatively well developed countries with strong shareholder rights. However, Kim, Kitsabunnarat-Chatjuthamard, and Nofsinger (2007) find that between countries in Europe there are still considerable differences. Aggarwal, Erel, Ferreira, and Matos (2011) argue that the governance of firms in countries with weak shareholder rights is substantially influenced by foreign institutional investors. In contrast, the governance of firms in countries with strong shareholder protection is more likely to benefit from domestic institutional investors.

Finally, Johnson, Schnatterly, Johnson, and Chiu (2010) address the heterogeneity of institutional investors, as each type of institutional investor faces unique legal constraints and conditions. Pension funds and insurance companies are subject to a strict legal environment, as these funds have a crucial function in society. For example, considering their responsibility for funding retirement, pension funds have to be prudent in order to conform to

the high standards of state trust laws and employee retirement income legislation (Bushee, Carter, & Gerakos, 2004). Alternatively, investment advisers and mutual funds face the least regulative pressure of any type of institution (Del Guercio, 1996). These funds are created for total liquidity; investors can change their investment strategy on a daily basis (Monks & Minow, 1992). Thus, the extent to which institutional investors can have an impact, may depend on their underlying legal differences.

2.3 The Impact of Institutional Investors on Firm Decisions

Academics have examined the role of institutional investors in a variety of firm policies (see table 1 for an overview), but the majority of engagement relates to the governance of the firm. For example, Ertimur, Ferri, and Muslu (2011) study the impact of compensation-related activism, particularly initiated by pension funds. They find that institutional investors are more likely to target firms with abnormally high CEO pay and they demand a stronger pay-performance relationship. They report a reduction of 7.3 million dollars in total CEO pay after intervention of institutional investors. In addition, Marquardt and Wiedman (2016) examine institutional investors board diversity. They find that firms with a gender diverse board are less likely to be targeted by institutional investors, suggesting that shareholder activism is an effective mechanism to increase board diversity. In the two years after being targeted, targets significantly increase their female board representation.

Further, there is empirical evidence of institutional investors and their influence on other major firm decisions. Brav et al. (2018) study institutional investors and corporate innovation. They find that firms targeted by hedge fund activists enhance their innovation efficiency. While research and development expenditures are reduced, innovation output increases after interference of hedge funds. In addition, a relationship between institutional ownership and capital structure is found by Michaely and Vincent (2012). After an increase in institutional ownership, firms respond by reducing their leverage. The authors suggest that institutional owners are a substitute for debt in the act of decreasing asymmetric information in the principal-agency conflict. Further, Firth et al. (2016) examine the impact of institutional investors on cash dividend policies. They find that institutional investors affect cash dividend

Table 1: Overview of Institutional Investors and Firm Decisions

This table displays empirical evidence of the impact of institutional investors on various corporate governance features in panel A and various firm operations in panel B.

Article	Firm decision	Main findings
Panel A: Corporate governance features		
Ertimur et al. (2011)	CEO pay	Institutional investors are more likely to target firms with abnormal high CEO pay and they demand a stronger pay-performance relationship.
Del Guercio et al. (2008)	Board and management turnover	Direct negotiations result in an increase in board and management turnover.
Marquardt and Wiedman (2016)	Board diversity	Firms with gender diverse board are less likely to be targeted by institutional investors.
Thomas and Cotter (2007)	Anti-takeover defense	Anti-takeover defenses such as the poison pill and classified board are increasingly removed when demanded by shareholders.
Boyson and Mooradian (2011)	Target board size	In three-quarter of their target firms, hedge fund activists are successful in increasing target board size.
Panel B: Firm operations		
Brav et al. (2018)	R&D	Firms targeted by hedge fund activists enhance their innovation efficiency. While research and development expenditures are reduced, innovation output increases after interference of hedge funds.
Michaely and Vincent (2012)	Capital structure	After an increase in institutional ownership, firms respond by reducing their leverage.
Firth et al. (2016)	Dividend policy	Institutional investors affect cash dividend policies as they force firms to increase their cash dividend.
Attig et al. (2012)	Cash flows	Institutional investors with a long-term investment horizon decrease the sensitiveness of investment outlays to internal cash flows.
Clifford (2008)	Asset divestiture	Hedge funds are able to force firms to divest under-performing assets.
Gantchev et al. (2019)	M&As	There is a substantial higher probability that acquirers with unsatisfactory takeovers get targeted by activists. After they get targeted, these firms undergo fewer takeovers but these result in higher returns.

policies as they force firms to increase their cash dividend. They suggest that investors demand a higher payout in order to decrease a firm's free cash flow that is under control of insiders. While initially activism motives were mainly financial in essence, Judge, Gaur, and Muller-Kahle (2010) address the growth of social activism, which concerns the pursuit for social legitimacy. They find

that institutional investors increasingly take the corporate social responsibility of their target firms into account and firms to act accordingly.

2.4 Mergers and Acquisitions

M&As are among the most important practises to increase firm growth and shareholder value (Masulis, Wang, & Xie, 2007; Yaghoubi, Yaghoubi, Locke, & Gibb, 2016). A merger is a consolidation of two firms into a new business entity, whereas an acquisition takes place when a firm purchases assets or equity of another firm and takes full control of it. As both events result in the consolidation of assets and liabilities into one entity, their definitions are often intertwined. The takeover market has seen a considerable growth over the decades. For example, in the US there was a compound annual growth rate of 5.86% for the period 1985-2018 (IMAA-Institute, 2020).

Value creation through M&As is a prominent topic in the financial literature, and numerous studies have examined the short-term and long-term performance of M&A deals. Rossi and Volpin (2004) argue that M&As can help substantially in reallocating assets towards their best possible use. However, due to several frictions, the outcomes of M&As is often not as expected. Empirical evidence up to today has been mixed. Most studies show only little or even negative announcement returns for bidders. On the other hand, consistent evidence has been found for targets as these are more likely to benefit from a takeover. An example of this mixed evidence is Goergen and Renneboog (2004), who find in their study announcement effects of only 0.7% for bidders, while announcement effects for targets were 9%. However, Alexandridis, Antypas, and Travlos (2017) find that since 2009 M&As generate more value for shareholders of acquirers than in the past, suggesting that a turning trend is going on.

A remarkable fact about M&A activity is that the global market for corporate control occurs in waves. A merger wave is characterized by a cyclic pattern, a period of higher activity in M&A deals is followed by a relatively calmer period. Several large waves have occurred since the end of the 19th century, and each wave has had different characteristics and outcomes (Martynova & Renneboog, 2008). The current upward wave is mainly influenced by divestments and spin offs, mega deals and cross border deals (Hitchcock, Prakash, Negrete, & Ramdevkrishna, 2019). Generally, the literature uses two views to

explain the drivers of merger waves: the behavioral view and the neoclassical view. The behavioral view assumes that a boom in stock market leads to an overvaluation of stock. Rational managers know this and use this opportunity to prevent a future decline by buying assets from another firm with their overvalued stock. Alternatively, the neoclassical view assumes that economic, regulatory, or cultural shocks can lead to industry merger waves. However, there must be sufficient capital liquidity available on a macro level to cluster industry waves into an aggregate merger wave (Harford, 2005).

There is a range of characteristics that divide different types of M&As. For example, within the perspective of the value-chain, takeovers can be grouped as either horizontal, vertical or conglomerate (Gaughan, 2011). In addition, M&As can be divided in domestic or cross-border. Moeller and Schlingemann (2005) argue that due to globalization and emerging of new markets, foreign investment opportunities have increased considerably. However, crossing national borders may cause additional challenges. Erel, Liao, and Weisbach (2012) suggest that cultural and geographic contrasts can result in increasing costs of takeovers. In contrast, cross-border M&As may bring substantial benefits, particularly for the target firm. For example, Chari, Ouimet, and Tesar (2010) argue that corporate governance of target firms can be improved when the target is located in a country with worse shareholder protection rights than the acquirer.

M&As can occur for a variety of reasons. Nguyen, Yung, and Sun (2012) classify M&A motives in value-increasing and non-value-increasing. Value-increasing M&As are particularly initiated to create synergy. The synergy motive suggests that the value of the combined firm is higher than the aggregate value of the two independent firms (Bradley, Desai, & Kim, 1988). Seth (1990) states that synergistic gains can be realized through an increase in market power, development of operational capabilities, or other sorts of financial gains. Additionally, Nguyen et al. (2012) suggest that agency, hubris and market timing are the three primary value-decreasing motives for M&As. The agency motive proposes that engagement in M&As is a result of the agency conflict. Managers often use takeovers for personal incentives at the expense of shareholders (Devers, McNamara, Haleblian, & Yoder, 2013). Managers affected by hubris are more likely to make mistakes in evaluating target firms and will undertake takeovers even when no synergy exists. Yang, Sun, Lin, and Peng (2011) state that managerial hubris may lead to overestimation of

capabilities to complete risky takeovers. Finally, the market timing motive suggests that engagement in M&A is related to the stock market. Shleifer and Vishny (2003) showed in their study that overvalued acquirers use a boom in the stock market to buy relatively undervalued targets.

The method of payment for an M&A is a value driver that can affect stock-market reactions. The financial literature has shown that the payment method is of major interest to shareholders and they often prefer cash financed deals over other payment methods. Fuller, Netter, and Stegemoller (2002) argue that the reason that the market prefers cash financed deals over stock financed deals stems from the fact that stock acquisitions are exposed to information asymmetry and valuation uncertainty. Nevertheless, there are several motives for the choice of payment method. The findings of Faccio and Masulis (2005) show a trade-off between corporate control threats and financing constraints of the bidder. As corporate control is threatened, stock financing is discouraged, while financing constraints encourage stock financing.

2.5 Empirical Evidence on Institutional Investors and their Impact on M&As

The literature contains a myriad of articles on the impact of institutional investors on M&As in various contexts. Engagement in takeovers can lead to substantial gains for shareholders (Gaspar et al., 2005). I discuss and divide the empirical evidence in three main categories, namely the impact of institutional investors on M&A engagement, the impact of institutional investors on M&A performance, and institutional investor activism around M&As.

The presence of institutional investors in acquiring firms as well as target firms has been found to have considerable impact on M&A engagement. Ferreira et al. (2010) examine foreign institutional ownership and engagement in cross-border M&As on a global scale. They find that the likelihood of a take-over to be cross-border is significantly affected by the presence of foreign institutional owners in the acquiring firm. This effect is particularly found in countries with weak legal institutional environments. Consequently, they suggest that foreign institutional investors function as facilitators by reducing transaction costs and information asymmetry. Brooks et al. (2018) examine the impact of cross-institutional ownership on takeovers. That is, ownership stakes in both the acquiring firm and target firm. They find that the likelihood

of a merger between two firms increases when they both have the same institutional owner. The two former studies have covered the impact of institutional investors on M&A engagement in a worldwide and US setting respectively, while the European setting has received only little attention yet. The article of Andriosopoulos and Yang (2015) bridges this gap by examining the effect of institutional investors on M&A engagement in the UK and finds that institutional investors in acquiring firms increase the probability that M&As are large, cross-border deals, and take control entirely. Additionally, they find that concentration of institutional ownership and foreign institutional ownership increase the probability of cross-border M&As.

Academics also find that institutional investors affect the performance of M&As. Chen et al. (2007) study institutional investor's investment horizon and M&A performance. They find that the presence of long-term institutional investors results in significantly higher acquirer announcement returns and long-term post-acquisition stock returns. Moreover, the long-term institutional investors have a positive effect on the withdrawal of bad bids. Matvos and Ostrovsky (2008) examine cross-institutional ownership and M&A performance. They find that institutional owners of acquiring firms are not losing money during M&A announcements because they often have large stakes in the targets and overcome the losses of the acquirer with the gains of the target. Ma (2020) focus on institutional investors and M&A performance in a Chinese context. She finds that institutional ownership has a positive effect on the performance of M&As. Particularly pressure-sensitive,large and domestic institutional investors have a greater impact on the performance.

Finally, the literature has spent considerable attention to shareholder activism as an instrument by which institutional investors can increase the performance of takeovers. Gantchev et al. (2019) suggest that activists are able to discipline inefficient managers. They find that there is a substantial higher probability that acquirers with unsatisfactory takeovers get targeted by activists. After they get targeted, these firms undergo fewer takeovers but these result in higher returns. Becht et al. (2016) find that voting by institutional investors results in higher announcement returns and indicate that voting is a powerful method to prevent managers from initiating value-destroying takeovers. Similarly, Li, Liu, and Wu (2018) find that the presence of institutional investors reduces the probability that the firm's management tries to circumvent shareholder voting when undertaking a deal. Moreover,

they find that when shareholders get involved in the takeover, better decisions are made and targets with greater synergy get acquired. An overview of the empirical evidence can be found in table 2.

Overall, evidence on institutional investors and M&As consistently indicates that the presence of institutional investors increases the probability of a takeover. Moreover, their monitoring and activism activities are increasingly involving M&As. My thesis is most closely related to the strand of literature dealing with institutional investors and their impact on M&A engagement. I contribute to this literature by focusing on a rich and dynamic geographical region: the euro area.

Table 2: Overview of Institutional Investors and M&As

This table displays empirical evidence of the impact of institutional investors on M&A engagement in panel A, M&A performance in panel B, and activism and M&As in panel C.

Authors	Side	Country	Period	Main findings
Panel A: Institutional investors and engagement in M&As				
Ferreira et al. (2010)	Both	Worldwide	2000-2005	The likelihood of a take-over to be cross-border is significantly affected by the presence of foreign institutional owners in the acquiring firm. This effect is particularly found in countries with weak legal institutional environments.
Brooks et al. (2018)	Both	U.S.	1984-2004	The likelihood of a merger between two firms increases when they both have the same institutional owner.
Andriosopoulos and Yang (2015)	Acquirer	U.K.	2000-2010	Institutional investors in acquiring firms increase the probability that M&As are large, cross-border deals, and take control entirely. Additionally, concentration of institutional ownership and foreign institutional ownership increase the probability of cross-border M&As.
Gaspar et al. (2005)	Target	U.S.	1980-1999	The presence of investors with a short term horizon in the target increases the likelihood of a takeover, while long-term investors increase the costs of a bid and make therefore a takeover less likely.
Qiu (2003)	Acquirer	U.S.	1992-1999	The presense of large public pension funds decreases the probability of an M&A. It particularly decreases the probability of an M&A by cash-rich firms and firms that are growth oriented.
Panel B: Institutional investors and M&A performance				
Faelten et al. (2015)	Acquirer	U.K.	2002-2010	The completion and success of cross-border deals depends on management learning from institutional investors with regional expertise.

Schmidt and Fahlenbrach (2017)	Acquirer	U.S.	1992-2010	After exogenous increases in passive institutional ownership, firms engage in worse M&As. Changes in ownership might increase agency costs.
Chen et al. (2007)	Acquirer	U.S.	1984-2001	The presence of long-term institutional investors results in significantly higher acquirer announcement returns and long-term post-acquisition stock returns. Long-term institutional investors have a positive effect on the withdrawal of bad bids.
Ma (2020)	Acquirer	China	2006-2017	Institutional ownership has a positive effect on the performance of M&As. Particularly pressure-sensitive, large and domestic institutional investors have a greater impact on the performance.
Matvos and Ostrovsky (2008)	Both	U.S.	1981-2003	Institutional owners of acquiring firms are not losing money during M&A announcements because they often have large stakes in the targets and overcome the losses of the acquirer with the gains of the target.
Panel C: Institutional investor activism and M&As				
Greenwood and Schor (2009)	Target	U.S.	1993-2006	Target firms have a higher likelihood to get acquired when hedge funds are present in their firm. Moreover, often shown high abnormal returns of hedge fund activism announcements are particularly explained by the investor's power to force targets into a takeover.
Boyson et al. (2017)	Target	U.S.	2000-2014	Hedge funds activism is positively related to the probability of receiving a takeover offer. Hedge funds are rising and there is an increasing importance of investor engagement in M&As
Gantchev et al. (2019)	Acquirer	U.S.	1997-2011	There is a substantial higher probability that acquirers with unsatisfactory takeovers get targeted by activists. After they get targeted, these firms undergo fewer takeovers but these result in higher returns.
Becht et al. (2016)	Acquirer	U.K.	1992-2010	Voting by institutional investors results in higher announcement returns and indicate that voting is a powerful method to prevent managers from initiating value-destroying takeovers.
Li et al. (2018)	Acquirer	Worldwide	1995-2015	The presence of institutional investors reduces the probability that the firm's management tries to circumvent shareholder voting when undertaking a deal. Moreover, they found that when shareholders get involved in the takeover, better decisions are made and targets with greater synergy get acquired.

2.6 Hypotheses

Foreign institutional ownership

While it is often argued that foreign institutional investors have information disadvantages due to physical, linguistic or cultural distances, Dvořák (2005) argues that foreign investors may have an information advantages that stem from their superior investment experience and competences. Froot and Ramadorai (2008) examine cross-border flow shocks and price and net asset value returns and suggest that foreign investors have an information advantage over domestic investors so they perform better. Similarly, Seasholes (2004) finds that foreign investors are substantially better in trading stocks of large firms in developing markets. Lin, Johnson, Chen, and Liu (2009) find that foreign investors outperform domestic investors when they have access to the same information, as they are more sophisticated in processing information.

Cross-border takeovers are particularly determined by asymmetric information and cultural distance. As a consequence, cross-border M&A deals require acquirers with excellent competences and experience (Kang & Kim, 2010; Dikova & Sahib, 2013). Foreign institutional investors have more long-term key information advantages than their local counterparts, as foreign institutional ownership has a positive effect on firm performance (Grinblatt & Keloharju, 2000; Dvořák, 2005). Andriosopoulos and Yang (2015) find in their study that foreign institutional ownership increases the probability of a large cross-border takeover. Moreover, foreign institutional investors can lower transaction costs, reduce cultural distances, and information asymmetries so they are able to act as facilitators of international investments (Ferreira et al., 2010). Given the arguments and empirical evidence, it is expected that foreign institutional ownership has a positive impact on the decision to engage in cross-border M&As. The hypothesis is stated as follows.

> **Hypothesis 1.** *Acquiring firms with a larger proportion of foreign institutional ownership are more likely to engage in cross-border M&As.*

Block institutional ownership

A high concentration of ownership may have a positive effect on the probability of a cross-border M&A, as a few powerful shareholders are more likely

to influence decision making, in contrast to dispersed ownership. Shleifer and Vishny (1986) suggest that blockholders can support takeovers by alleviating the free-rider problem. In contrast, minor institutional investors may have no stimulus to monitor, which is a costly process (Burns, Kedia, & Lipson, 2010). Clyde (1997) finds that companies that have concentrated institutional ownership are more likely to use M&As to discipline management. Ferreira et al. (2010) address the importance of blockholders as well, as they find that foreign institutional investors with more than 5% of the shares have a stronger effect on the probability of cross-border M&As than when they consider all foreign institutional investors. Similarly, Andriosopoulos and Yang (2015) find that the percentage of shares held by the five largest institutional investors has a positive effect on the probability of a cross-border M&A deal. Given the arguments and empirical evidence, it is expected that concentrated institutional ownership has a positive impact on the decision to engage in cross-border M&As. The hypothesis is stated as follows.

Hypothesis 2. *Acquiring firms with a higher concentration of institutional ownership are more likely to engage in cross-border M&As.*

3 Methodology

This chapter describes the modelling approach to examine the impact of institutional investors on M&As. I start off with describing commonly employed methods in related literature such as linear regression models, generalized linear models, and two-stage approaches. In this thesis I opt to model the probability of an M&A being cross-border by using the probit model discussed in section 3.2. This model appears to be most suited for my research setting for reasons I discuss during the remainder of this chapter. The chapter finalizes with a description of the institutional ownership variables and control variables used in my research.

3.1 Linear Regression Model

The linear regression model is widely used in various fields to quantify the relationship between a dependent variables and a set of independent variables. Attractive features of the linear model are its simplicity, ease of parameter interpretation as marginal effects, and the availability of an analytical solution to obtain parameter estimates. An example of an article in the field of institutional ownership and M&As that applies this model is Ferreira et al. (2010). They measure the relationship between institutional ownership and cross-border M&A probability on a country level, where the dependent variable is the ratio of M&A deals of a country undertaken by a foreign acquirer to the total number of completed deals in that country. The parameter estimates in the linear regression can be derived by means of ordinary least squares (OLS) estimation. However, for OLS to yield unbiased and efficient parameter estimates and standard errors, five assumptions are required (Wooldridge, 2016). The assumptions are given by:

1. Linearity: This assumption states that the model should be linear in terms of the parameters.

2. Strict exogeneity: This assumption states that the regressors should be uncorrelated with the error term.

3. No perfect multicollinearity: This assumptions requires the data matrix to be of full column rank which implies that the regressors should be linearly independent.

4. Spherical error variance: This assumption implies that the errors are required to be homoskedastic and not autocorrelated.

5. Independent and identically distributed observations: This assumption is required for asymptotic normality of the estimators and consequently allows me to do hypothesis testing.

In the next sections I extend the linear regression model to account for violations to the first and second assumptions, that is account for non-linearities and endogenous regressors, because researchers have found these assumptions to be violated in cases similar to mine. The third assumption is mathematical in nature and seldom violated. However, a strong but not perfect degree of multicollinearity could pose a problem by inflating standard errors. In order to detect whether this is problematic, I report variance inflation factors. A violation to the fourth assumption is less severe than the other ones. The OLS estimates will remain consistent but lose efficiency and standard errors may become biased. I accommodate for the possibility of errors being heteroskedastic by clustering standard errors on the firm level as discussed in Petersen (2009). Clustering takes place on the firm level as it is common for firms to perform several mergers or acquisition during the sample period. Therefore, it is to be expected that these observations are in some way related to each other and this is taken into account by clustering the standard errors. A different violation of spherical error variance is auto-correlation, but given the cross-sectional nature of my data the presence of auto-correlation is unlikely.

3.2 Generalized Linear Models

The main relationship I wish to quantify is the one between the probability of a merger being cross-border and various kinds of institutional ownership. The fact that the dependent variable is binary violates the linearity assumption of the linear regression model. In essence, this implies that the dependent variable is interpreted as the probability of an M&A being cross-border. Since probabilities are restricted in their range between 0 and 1, the true underlying model is inherently non-linear. Furthermore, the spherical error variance assumption is violated because the variance of the cross-border variable is directly related to the probability of it taking on a value of one. This probability varies between observations and thus the error term becomes heteroskedastic.

While some researchers are successful in applying a linear probability model (see for instance Matvos and Ostrovsky (2008)), a better approach would be to use a generalized linear model such as logit or probit as this class of models is specifically designed to deal with binary dependent variables. The logit model is used by Brooks et al. (2018) in their study on institutional cross-ownership and M&As to examine the effect of cross-institutional ownership on the probability of firms being acquirers and targets. Similarly, Boyson et al. (2017) employ a logit model to measure the association between hedge fund activism and the probability that a firm receives a takeover. Alternatively, in their deal-level analysis Ferreira et al. (2010) use a probit model to examine whether the presence of foreign institutional investors has a positive relationship with an M&A deal being cross-border. In the same way, Andriosopoulos and Yang (2015) examine the impact of institutional ownership on M&A engagement by means of a probit model. Gaspar et al. (2005) focus on the investment horizon of institutional investors and the probability of entering an M&A deal. Consequently, they used a probit model as well.

The logit and probit models work by modelling a latent variable with a linear structure and transform the latent variable to a probability via a link function. The model is specified as follows

$$y_i = f\left(\beta_0 + \beta_1 \cdot \mathrm{IO}_i + \sum_j \beta_{j+1} \cdot \mathrm{Control}_{ij} + \varepsilon_i\right) \tag{1}$$

where f is the link function, IO_i is one of the 5 measures of institutional ownership in panel B of table 3, and $\mathrm{Control}_{ij}$ are the control variables in panels C and D of table 3. The logit and probit models differ in their use of link function, respectively they use the logistic cumulative distribution function and the normal cumulative distribution function. These functions are defined as

$$\Lambda(x) = \frac{\exp(x)}{1+\exp(x)}, \qquad \Phi(x) = \int_{-\infty}^{x} \frac{1}{\sqrt{2\pi}} \exp\left(-\frac{u^2}{2}\right) du. \tag{2}$$

The logit and probit link functions may seem different, but their distribution functions are actually similar shaped and lead to comparable results. I therefore choose to adopt the probit model.

In contrast to the linear regression model, the marginal effects for the probit model are not constant and thus not equal to the coefficients. As recommended by Wooldridge (2010) I instead use average marginal effects to assess

the effect of each variable. Let $x_1, \ldots, x_p$ denote the explanatory variables, for the probit model the average marginal effect of variable x_j is given by

$$\text{AME}(x_j) = \frac{1}{N} \sum_{i=1}^{N} \frac{\partial}{\partial x_{ij}} \mathbb{E}(y_i | x_{i1}, \ldots x_{ip}) \tag{3}$$

$$= \frac{1}{N} \sum_{i=1}^{N} \beta_j \cdot \phi \left(\beta_0 + \beta_1 x_{i1} + \cdots + \beta_p x_{ip} \right), \tag{4}$$

where N is the number of observations and ϕ is the probability density function of the normal distribution.

3.3 Two-Stage Models

In this section I discuss a possible violation to the second OLS assumption of strict exogeneity of the regressors. Andriosopoulos and Yang (2015) and Ferreira et al. (2010) study a similar topic related to institutional ownership and they claim that it is endogenously determined. They state that endogeneity arises due to the possibility that a large and active stock market may be inherently attractive to institutional investors.

An often used approach to deal with endogeneity is by using a lagged version of the explanatory variable instead of the current version. The idea behind this approach is that it avoids simultaneity bias as the lagged variable is observed earlier in time than the dependent variable. Hence, it should be impossible for the dependent variable to cause the explanatory variable. However, like the regular assumption of no endogeneity in the linear regression model, this approach is similarly based on untestable assumptions and Bellemare, Masaki, and Pepinsky (2017) recommend that it should not be used unless the researcher is able to come up with a sound theoretical motivation for these untestable assumptions. This recommendation is reinforced by Reed (2015), who demonstrates that the use of lagged explanatory variables to deal with endogeneity can yield inconsistent estimates and invalid hypothesis tests.

A safer and generally accepted approach to deal with endogeneity is instrumental variables. Andriosopoulos and Yang (2015) and Ferreira et al. (2010) both make use of two-stage models to address endogeneity, but differ in their implementation of the two-stage models. Ferreira et al. (2010) make

use of a two-stage linear probability model, while Andriosopoulos and Yang (2015) employ a two-stage probit model. Both approaches can be summarized by the following two equations

$$y_{i1} = f\left(\beta_0 + \sum_j \beta_j \cdot \text{Control}_{ij} + \gamma \text{IO}_i + \varepsilon_i\right) \tag{5}$$

$$\text{IO}_i = \delta_0 + \sum_j \delta_j \cdot \text{Instrument}_{ij} + \sum_j \alpha_j \cdot \text{Control}_{ij} + \nu_i, \tag{6}$$

where y_{i1} is the dependent variable, IO_i is an endogenous measure of institutional ownership, Control_{ij} are the exogenous control variables, Instrument_{ij} are the instruments for institutional ownership, and f is the link function. The idea behind two-stage models is to project the endogenous variable onto the instruments in order to isolate an exogenous part of that variable that can be used to estimate the coefficients in equation (5). In steps that is, first a regression on equation (6) is carried out to obtain fitted values for IO_i. Second, the fitted values are substituted as a replacement for IO_i which allows the researcher to estimate the coefficients in equation (5) as usual. Both Ferreira et al. (2010) and Andriosopoulos and Yang (2015) make use of this procedure, but they differ in their choice for the link function f. Ferreira et al. (2010) consider a linear probability model which has the identity link function $f(x) = x$, while Andriosopoulos and Yang (2015) make use of a probit model which uses the link function $f(x) = \Phi(x)$, where Φ is the cumulative normal distribution function. Both link functions are valid choices, however the cumulative normal distribution function has the advantage that it ensures that the probability will remain between zero and one.

Theoretically, a regressor is endogenous when it is correlated with the error term. From a practical viewpoint, endogeneity occurs in three situations: measurement error in the independent variable, simultaneity, and omitted variables. Measurement error straightforwardly means that one does not observe the true independent variable, but the independent variable plus a random noise term. If left uncorrected, it downwardly biases the regression coefficient which is called attenuation bias. Simultaneity occurs when the independent variable causes the dependent variable, but also the reverse. An example is the pay-performance relation. Workers are compensated for better performance by higher pay, but simultaneously higher pay may increase a worker's motivation

and thus their performance. Finally, omitted variable bias occurs when an omitted variable has explanatory power for the independent variable, but is also correlated with an included independent variable. An example of this bias is the Mincer equation where wages are regressed on years of schooling. The omitted variable in this case is a worker's intelligence, a more intelligent worker may command a higher wage but generally has more years of schooling. Thus, the positive effect of the omitted intelligence is ascribed to the schooling variable and hence the coefficient is biased.

Of the three aforementioned sources of endogeneity it is most likely that the aforementioned authors are referring to omitted variable bias. The rationale is that an active stock market inherently attracts institutional investors, which biases the coefficient corresponding to the institutional ownership variable in the regression model.

In order to account for endogeneity, a researcher needs instruments that are both relevant, in the sense that they are sufficiently correlated with the endogenous variable, and valid, in the sense that the instruments are exogenous themselves. The instruments used by Andriosopoulos and Yang (2015) are several country risk indicators and the competitiveness of a market and Ferreira et al. (2010) use a range of instruments for the level of institutional ownership in a country. While it is reasonable to expect these indicators to be valid as instruments, it is questionable to what extent they are relevant. The authors do not discuss the relevance of their instruments. Moreover, by using the same set of instruments as in Andriosopoulos and Yang (2015) I am unable to prove their relevance (see appendix A for the first stage regression results). I use the six dimensions of the Worldwide Governance Index by the World Bank as instruments. These dimensions include 'Voice and Accountability', 'Political Stability and Absence of Violence/Terrorism', 'Government Effectiveness', 'Regulatory Quality', 'Rule of Law', and 'Control of Corruption'. In addition, I use the activeness and competitiveness of a market as instrument. I find F-statistics of the first stage regression not exceeding 2.5, while the literature commonly employs a threshold of 10 as sufficiently relevant (Staiger & Stock, 1997). Therefore, it is doubtful to what extent it is both feasible and necessary to apply these instrumental variable approaches to correct for the potential endogeneity of institutional ownership.

3.4 Variables

I examine the impact of several forms of institutional ownership on cross-border M&A engagement. An M&A deal is defined as cross-border when the acquirer's headquarter located in a different country than the target's headquarter, so therefore the dependent variable is binary.

I calculate the percentage of total institutional ownership, foreign institutional ownership, and domestic institutional ownership for each firm at the year prior to the completion announcement of the M&A deal, related to the year-end ownership percentage as in Aggarwal et al. (2011) and Andriosopoulos and Yang (2015). In addition, I examine the potential effects of concentrated institutional ownership. The measurement of institutional ownership concentration follows Andriosopoulos and Yang (2015) and Hartzell and Starks (2003) and applies two alternatives; the cumulative percentage of the five largest shareholdings held by institutional investors and the largest shareholding percentage held by an institutional investor.

Several control variables are used to adjust for firm-specific effects. However, a few variables of related studies were unavailable and have been proxied by related variables or dropped. Firm size may influence M&A activity and the tendency to engage in M&A deals (Amburgey & Miner, 1992; Sanders, 2001). Therefore, I control for firm size, measured as the natural logarithm of total assets (Goranova, Dharwadkar, & Brandes, 2010). I also control for firm performance, often measured by return on assets or return on equity. Morrow Jr, Sirmon, Hitt, and Holcomb (2007) find that prior firm performance affects a firm's tendency to conduct strategic activities. I measure firm performance with return on assets, a widely used proxy in this field of research (see for example Brooks et al. (2018) and Goranova et al. (2010)). Most related studies also control for a firm's growth opportunities, often measured by sales growth or Tobin's Q. I use Tobin's Q, following Andriosopoulos and Yang (2015) and Goranova et al. (2010). Andriosopoulos and Yang (2015) argue that firms with higher leverage are more likely to engage in cross-border M&As, as they are better able to avoid potential obstacles. Therefore, leverage is included, measured as the total debt relative to total assets. Furthermore, I control for a firm's cash flows, as firms with substantial amounts of cash are more likely to engage in M&A deals (Harford, 1999). This is measured as the cash and equivalents relative to total assets, consistent with Carow, Heron,

and Saxton (2004). Finally, I control for intangible assets. Surroca, Tribó, and Waddock (2010) argue that a firm's intangible assets are key in creating competitive advantage and value creation. The variable is measured as the total intangible assets relative to total assets, following Andriosopoulos and Yang (2015).

I control for the characteristics of the M&A deals with several binary variables. A cross industry dummy is included as cross industry deals are harder to complete due to information asymmetry. Moreover, I control for industry effects with several industry dummies, consistent with for instance Goranova et al. (2010). I also control for a listed target and the initial stake in the target prior the the deal. Andriosopoulos and Yang (2015) find that acquirers are more likely to engage in deals with listed targets of which they already have shares. They suggest that these characteristics decrease information asymmetries. Further, Bris and Cabolis (2008) state that it is essential to take the methods of payment into account to interpret deal outcomes. Martin (1996) finds that an increase in institutional blockholding decreases the likelihood of a share financing. I use a dummy for share payment to control for this characteristic. Finally, I control for M&A experience. King, Dalton, Daily, and Covin (2004) argue that M&As are often complex processes and prior experience by the acquirer therefore affects the deal performance considerably. Consequently, the M&A experience variable takes one if the acquirer has M&A experience prior the the M&A announcement, following Andriosopoulos and Yang (2015). An overview of all variables employed can be found in table 3.

Table 3: Description of the Variables

Variables	Description
Panel A: Dependent variable	
Cross-border M&A	Binary variable that takes one when the acquirer has a headquarter in a different country than the target and zero otherwise
Panel B: Firm-level institutional ownership variables	
Largest institutional investor	Percentage shareholdings held by the largest institutional investor in the acquiring firm at the year prior announcement
Top 5 institutional ownership	Cumulative percentage shareholdings held by the top five institutional investors in the acquiring firm at the year prior to the deal announcement
Domestic institutional ownership	Cumulative percentage shareholdings held by institutional investors in the acquiring firm with a country code identical to that of the firm at the year prior to the deal announcement
Foreign institutional ownership	Cumulative percentage shareholdings held by institutional investors in the acquiring firm with a country code different than that of the firm at the year prior to the deal announcement
Total institutional ownership	Cumulative percentage shareholdings held by all institutional investors in the acquiring firm at the year prior deal announcement
Panel C: Firm-specific control variables	
Firm size	Natural logarithm of total assets of the acquiring firm at the year prior to the M&A announcement
Return on assets	Net assets divided by the book value of total assets at the year prior to the M&A announcement
Leverage	Ratio of total debt to total assets of acquiring firm at the year prior to the M&A announcement
Cash & Equivalent	Ratio of cash and equivalents to total assets of acquiring firm at the year prior to the M&A announcement
Intangible assets	Ratio of total intangible assets to total assets of acquiring firm at the year prior to the M&A announcement
Tobin's Q	Market value of equity plus total debt and divided by book value of assets of acquiring firm at the year prior to the M&A announcement
Panel D: M&A deal-related variables	
Cross industry	Binary variable that takes one if the acquiring and the target firms have different NACE rev.2 codes and zero otherwise
Listed target	Binary variable that takes one if the target firm is a publicly listed firm and zero otherwise
Initial stake	Binary variable that takes one if the acquiring firm has an initial stake in the target firm prior the the M&A announcement and zero otherwise
Share payment	Binary variable that takes one if the M&A deal employs shares only as a payment method and zero otherwise
M&A experience	Binary variable that takes one if the acquiring firm has M&A experience prior to the M&A announcement and zero otherwise

4 Data

I study M&As and acquirers from the euro area, consisting of 19 of the 27 European member states that have adopted the euro as their currency. I have excluded Slovakia, the Baltic states Estonia, Latvia, and Lithuania as they were not part of the euro area throughout the sample period or had no deals due to the sample selection criteria. Table 4 presents a list of the 15 countries and their corresponding abbreviations. The unifying policy of the European Union has resulted in macroeconomic stability, increased trade, and financial integration for its participating countries (Juncker et al., 2015). Given this fact, it is likely that this has resulted in increased cross-border M&A deals for acquirers from this region. The M&A data has a window of 9 years, beginning at January 2011 and ending at December 2019. This period contains the aftermath of the Great Recession of 2008, the European sovereign debt crisis, and a peak in economic growth towards the end of the decade. The diversity of this period is expected to contribute to the trustworthiness of the results as it is a justifiable reflection of the turbulent character of the M&A market.

Table 4: Countries and Abbreviations

Abbreviation	Country	Abbreviation	Country
AT	Austria	IE	Ireland
BE	Belgium	IT	Italy
CY	Cyprus	LU	Luxembourg
DE	Germany	MT	Malta
ES	Spain	NL	The Netherlands
FI	Finland	PT	Portugal
FR	France	SI	Slovenia
GR	Greece		

Data on M&A deals is retrieved from Zephyr. Only deals where the acquirer is headquartered in the euro area are selected. The following criteria, as in Andriosopoulos and Yang (2015), are used to to selected the final sample. (1) The bidder must be listed. (2) The bidder has equity ownership and financial records available at the year prior to the announcement from Orbis. (3) The deal is completed in the sample period. (4) All financial bidders and targets are excluded. (5) Deals with a value less than 0.1 million are excluded from the sample. (6) Targets are both euro area and non-euro area firms, including subsidiary, private, and listed firms. I use listed bidder firms only since these firms have accurate ownership data. Financial firms are excluded due to the uniqueness of their structure and regulations, as they cannot be

relevantly compared to firms in other industries. The restriction on the deal value allows me to focus on the large and from an economic viewpoint more relevant deals. In addition, most listed firms engage only in deals with a value of 0.1 million or higher. These criteria yield a final sample of 590 completed M&A deals undertaken by public listed acquirers of the countries in table 4, where 157 deals are domestic (27%) and 433 are foreign (73%).

Table 5 displays the annual M&A distribution. As can be seen, the majority of deals is cross-border. This is a remarkable difference to the deals of the UK in Andriosopoulos and Yang (2015) and the US in Ferreira et al. (2010), where the majority of the deals is domestic. However, M&As conducted by acquirers from European countries in Ferreira et al. (2010) are mostly cross-border as well. Moreover, the size of cross-border deals is substantially larger than for domestic deals (678.30 million to 121.73 million). After a peak in 2015, annual deal numbers and size decrease gradually, identical to a typical M&A cycle.

Table 5: Annual Distribution of M&As

This table displays the annual distribution of the number of M&A deals and M&A deal size (in millions of EUR) for completed domestic and foreign M&As initiated by acquiring firms from the euro area between 2011 and 2019.

Year	Domestic		Foreign		Total	
	Number	Size	Number	Size	Number	Size
2011	30	9,167.15	48	46,515.72	75	55,682.86
2012	15	5,598.38	30	10,810.66	50	16,409.04
2013	18	13,266.16	29	11,877.32	48	25,143.48
2014	13	21,238.26	54	62,694.69	67	83,932.95
2015	21	41,069.74	61	211,914.40	84	252,984.14
2016	25	9,199.79	46	104,881.78	72	114,001.56
2017	13	13,305.57	58	52,259.03	72	65,564.60
2018	16	6,121.83	57	130,191.28	77	136,313.12
2019	6	921.41	50	45,421.32	57	46,342.74
Total	157	119,808.29	433	676,566.21	590	796,374.49

Furthermore, figure 1 illustrates the distribution of M&A deals across the countries in the sample. Deal activity is considerably diffused: Germany and France clearly top the sample with more than 100 deals each, while a few countries exhibit less than 10 deals. Italy, the Netherlands, Spain and Ireland have moderate to high deal activity with 40 to 80 deals per country. Additionally, in the majority of the countries cross-border M&As occur more frequently. Only in Spain, Italy, Portugal and Greece the ratio cross-border/domestic is approximately even or domestic deals occur more frequently. A possible expla-

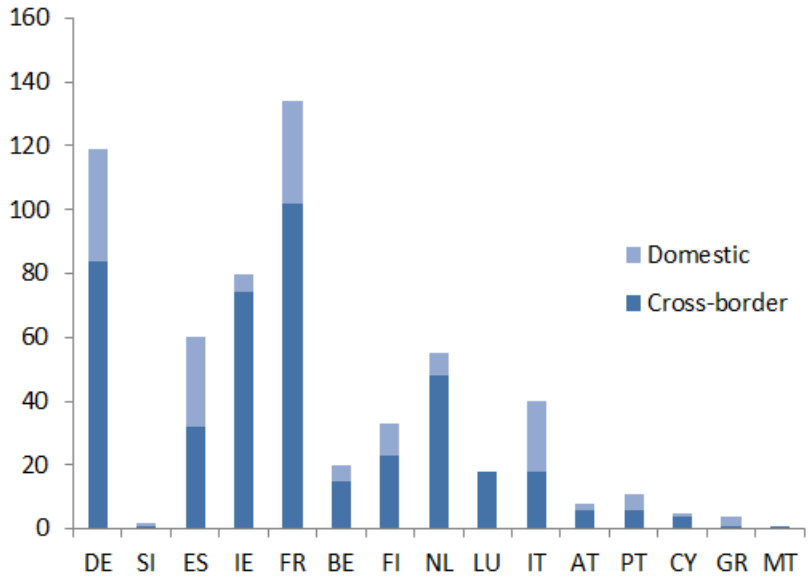

Figure 1: M&A Distribution across Countries

This figure visualizes the total number of completed cross-border and domestic M&A deals of each country between 2011 and 2019.

nation for this may be that the the economies of these countries are focused on domestic consumption (Regan, 2017). Moreover, the economies of these countries are relatively weak. As cross-border M&As are more complex and risky, acquirers may prefer to engage in safer domestic M&As. Figures 2 and 3 in appendix B illustrate the distributions of the number and deal size of M&As across the countries relative to the stock market capitalization of each corresponding country. Some countries (for instance Slovenia, Ireland, Luxembourg and Cyprus) have relatively higher percentages. Although most of these countries are less active in numbers than other countries in the sample, their small stock market capitalization displays a different view in terms of activeness.

Data on institutional ownership has been retrieved from Orbis, which provides information on types of ownership as well as historical holders. The institutional ownership data has a window of 9 years, beginning in 2010 and ending in 2018. The majority of target firms in the sample are privately held. Therefore, it is not possible to obtain accurate data on the ownership of target firms and I examine only the impact of institutional ownership at acquiring firms. Table 6 displays the institutional ownership distribution across the countries of the sample. Remarkably, foreign institutional investors have al-

most twice as much holdings in firms as domestic institutional investors (21.99 to 11.70%). The total institutional ownership of some countries deviates from the rest of the countries. For example, Greece has an average of 11.55%, while Malta has an average of 67.05%. However, they have only data on 4 firms and 1 firm respectively. Overall, percentages are close to each other. France, Ireland, and the Netherlands have relatively higher percentages with more than 30%, while the average institutional ownership in Belgium and Germany is close to 20%. These numbers are similar to for instance Bena, Ferreira, Matos, and Pires (2017). They report foreign institutional ownership percentages close to mine. For France they report a percentage of 19%, similar to my 19.56%. For Germany they report a percentage of 23%, close to my 18.79%. For Ireland, they report a percentage of 39%, close to my 36.87%. In their study Spain has a percentage of 18%, close to the 18.42% in my thesis. The institutional ownership percentages in Europe reported in Faias and Ferreira (2017) show a similar view. They measure institutional ownership as a fraction of the stock market capitalization. Finland, Ireland, and the Netherlands have relatively high institutional ownership percentages, while for France and Spain this is moderate. Overall, the institutional ownership percentages in my are comparable to other studies. My data can therefore be considered as reliable.

Table 6: Institutional Ownership Distribution

This table displays the distribution of the institutional ownership percentages of acquiring firms prior to the M&A deals for each country in the period 2018-2018.

Country	Largest	Top_5	Total_IO	Domestic	Foreign	N
AT	2.84	9.24	16.44	1.48	14.96	8
BE	9.62	16.69	21.67	8.14	13.53	20
CY	23.02	36.93	40.79	30.56	10.23	5
DE	7.05	17.10	24.15	5.86	18.29	120
ES	10.66	24.20	31.86	14.99	16.87	61
FI	9.71	22.78	33.04	17.51	15.53	37
FR	12.66	23.41	32.91	16.98	15.30	138
GR	2.98	8.03	11.55	2.90	8.64	4
IE	8.08	22.16	37.21	1.95	35.26	81
IT	19.54	27.76	34.74	17.80	16.93	40
LU	20.46	30.64	39.20	10.83	28.37	18
MT	8.80	33.46	67.05	0.00	67.05	1
NL	10.89	23.17	33.66	7.44	26.22	56
PT	13.64	31.34	44.48	21.69	22.79	11
SI	8.17	26.37	36.76	33.10	3.66	2
All countries	10.87	22.06	31.46	11.09	20.37	590

Table 4 displays descriptive statistics for my data. Panel A shows that the average total institutional ownership in acquiring firms is 31.46%. This

is considerably lower than the 49.35% of the UK in Andriosopoulos and Yang (2015) and the 73.3% of the US in Ferreira et al. (2010). The foreign institutional ownership is 20.37% on average. This indicates that foreign institution investors are more dominant than domestic institutional investors, which is in contrast with the results of the UK and US, reported in Andriosopoulos and Yang (2015) and Ferreira et al. (2010) respectively. Regarding block institutional ownership, the average ownership of the largest institutional investor is 10.87%, while the top 5 institutional investors have an aggregate ownership of 22.06%. This is quite similar to the 8.93% and 24.27% in the UK (Andriosopoulos & Yang, 2015).

Panel B shows the descriptive statistics for the firm-level control variables. Firm size is rightly skewed, where the severity of this skew can be determined by the large standard deviation. I address this issue by transforming the variable and taking the logarithm. The mean firm size is 27.10 million euros, which is higher than the 7.18 million dollars reported in Brooks et al. (2018). The mean leverage is 0.62, which is substantially higher than that of Andriosopoulos and Yang (2015), but close to the 58.62% of Brooks et al. (2018). The mean value of cash & equivalent is 0.12, which is close to Carow et al. (2004) and Brooks et al. (2018) (0.1584 and 0.15). Intangible assets has a mean value of 0.3, which is close to that of Andriosopoulos and Yang (2015), who report a value of 0.26. Growth opportunities, measured by Tobin's Q, has a mean value of 1.02. This is quite lower than the 1.72 of Andriosopoulos and Yang (2015) and 8.12 of Goranova et al. (2010).

Panel C presents descriptive statistics for the continuous variables separately for domestic and cross-border M&As. Notable is that for the block institutional ownership measures the means for domestic and cross-border M&As are relatively close to each other, where in case of domestic M&As the acquiring firms have slightly higher institutional ownership percentages. Further, institutional investors hold larger stakes in acquiring firms conducting cross-border M&As (32.09%), compared to domestic M&As (29.72%). Moreover, foreign institutional investors hold larger stakes in firms conducting cross-border M&As than domestic M&As (22.29% and 15.10% respectively), while for domestic institutional investors this is the opposite (9.80% and 14.63%).

Panel D shows the descriptive statistics for the binary variables. The numbers illustrate that firms engaging in cross-border deals are more likely to target firms in a different industry and have more M&A experience than firms

engaging in domestic deals. This is an indication that M&A experience helps in overcoming information asymmetry and other issues occurring in risky cross-border and cross-industry deals, which is in line with the arguing of Ferreira et al. (2010). Firms that engage in domestic deals are more likely to target listed targets and in which they already have an initial stake, in contrast to cross-border deals. This is an indication that firms are more likely to engage in safe deals as the information asymmetry is lower in domestic deals and when firms already have a stake in a listed target. This is consistent with Kang and Kim (2010). Firms are more likely to use cash rather than shares as a method of payment in both domestic and cross-border deals, which is consistent with the results of Andriosopoulos and Yang (2015).

Panel E shows the percentages for the major industry categories. The manufacturing industry is with a weight of 51% the most dominant industry in M&As. The electricity & construction and information industry industries are also relatively larger with a weight of 11% and 18% respectively. There are only a few missing observations. Therefore, I consider an imputation procedure by replacing missing values with the median observed of the respective variable. I also examine possible outliers. Cook (1977) introduces a distance measure to detect influential observations. These observations can be found in appendix C. Bollen and Jackman (1985) recommend to regard observations with a distance larger than $\frac{4}{n}$ to be influential, where n is the total number of observations. In appendix C this boundary is represented by the red line. All observations above the boundary have been checked and dealt with accordingly. For example, some variables had observations that exceeded the maximum of 100%. Moreover, I winsorized the firm-level control variables at the 2.5% and 97.5% percentiles to deal with extreme values.

Table 8 displays Pearson's correlation matrix. Pearson's correlation coefficient is the test statistic that measures the association between two continuous variables. Hair, Black, Babin, Anderson, and Tatham (1998) suggest that correlation coefficients between 0.3 and 0.5 show a moderate degree of correlation, while correlation coefficients higher than 0.5 show a high degree of correlation. As could be expected, there is a high degree of correlation between almost all pairs of institutional ownership variables. As I use the variables alternatively this poses no problem. All other pairs of variables are only low to moderately correlated. Hence, there are no signs of multicollinearity.

Table 7: Descriptive Statistics

This table displays the descriptive statistics for the institutional ownership variables in panel A, the firm-level characteristics in panel B, the continuous variables separated for domestic and cross-border M&As in panel C, the deal characteristics in panel D, and the major industry categories in panel E.

Panel A: Institutional ownership variables

Variable	Mean	Median	Min	Max	S.D.	N
Largest institutional investor	10.87	6	0	100	14.54	590
Top 5 institutional ownership	22.06	18.74	0	100	17.85	590
Total institutional ownership	31.46	28.58	0	100	21.81	590
Domestic institutional ownership	11.09	4.59	0	100	16.87	590
Foreign institutional ownership	20.37	15.83	0	95.14	17.56	590

Panel B: Firm-level characteristics

Variable	Mean	Median	Min	Max	S.D.	N
Firm size (millions of EUR)	27.10	8.20	0.52	123.00	46.40	590
Log firm size	15.94	15.92	9.61	19.86	1.70	590
Leverage	0.62	0.61	0.35	0.88	0.18	590
ROA	4.42	4.22	-3.22	12.94	6.84	590
Cash & Equivalent	0.12	0.09	0.02	0.36	0.11	585
Intangible assets	0.30	0.28	0.02	0.65	0.20	586
Tobin's Q	1.02	0.83	0.18	2.56	0.92	564

Panel C: Domestic vs. cross-border M&As

	Domestic			Cross-border		
Variable	N	Mean	Median	N	Mean	Median
Largest institutional investor	157	12.05	6.15	433	10.44	5.98
Top 5 institutional ownership	157	22.27	17.46	433	21.98	19.36
Total institutional ownership	157	29.72	25.51	433	32.09	29.59
Domestic institutional ownership	157	14.63	6.60	433	9.80	3.99
Foreign institutional ownership	157	15.10	13.42	433	22.29	17.29
Firm size (millions of EUR)	157	31.70	6.70	433	25.40	8.82
Log firm size	157	15.80	15.72	433	15.99	15.99
Leverage	157	0.64	0.64	433	0.61	0.61
ROA	157	4.04	3.56	433	4.56	4.48
Cash & Equivalent	157	0.11	0.08	433	0.13	0.09
Intangible assets	157	0.24	0.21	433	0.33	0.31
Tobin's Q	157	0.82	0.59	433	1.09	0.85

Panel D: Mean values for deal characteristics

	Domestic		Cross-border		Total	
Variable	Mean	N	Mean	N	Mean	N
Cross industry	0.55	157	0.60	433	0.59	590
Listed target	0.06	157	0.05	433	0.05	590
Initial stake	0.31	157	0.13	433	0.18	590
Share payment	0.22	157	0.06	433	0.10	590
M&A Experience	0.47	157	0.61	433	0.57	590

Panel E: Percentages for major industry categories

	Domestic		Cross-border		Total	
Industry	%	N	%	N	%	N
Agriculture & Mining	8	157	3	433	4	590
Manufacturing	36	157	56	433	51	590
Electricity & Construction	19	157	8	433	11	590
Wholesale	6	157	4	433	4	590
Transportation & Accommodation	3	157	5	433	4	590
Information	22	157	16	433	18	590
Public administration	4	157	9	433	7	590
Services	2	157	1	433	1	590

Table 8: Pearson's Correlation Matrix

		1	2	3	4	5	6	7	8	9	10	11
1	Foreign institutional ownership	1										
2	Domestic institutional ownership	-0.200***	1									
3	Largest institutional investor	0.130***	0.810***	1								
4	Top 5 institutional investors	0.430***	0.760***	0.890***	1							
5	Total institutional ownership	0.650***	0.610***	0.720***	0.930***	1						
6	Leverage	-0.030	0.010	0.040	0.010	-0.010	1					
7	ROA	0.080**	0.001	0.010	0.020	0.070*	-0.280	1				
8	Cash & Equivalent	0.030	0.070	0.070*	0.080**	0.080*	-0.240***	0.001	1			
9	Intangible assets	0.130***	-0.100	-0.010	0.010	0.040	-0.010	-0.010	-0.220***	1		
10	Log firm size	-0.150***	-0.090**	-0.150***	-0.180***	-0.190***	0.140***	0.110***	-0.260***	0.010	1	

***p <0.01, **p<0.05, *p<0.10

5 Results

Table 9 presents the results of the probit regression. A drawback of the probit model is that the estimated model coefficients cannot be directly interpreted as in linear regression models. The betas of the probit model reflect the effect of a single unit change in the independent variable on the z-score of the dependent variable. So, the coefficients have a direct effect on the z-score and only an indirect effect on the probability of an M&A being cross-border. As this interpretation is unrevealing, I use marginal effects to interpret the output.

An inherent problem of marginal effects in a non-linear model is that they are not constant and depend on the x-value. Therefore, I consider average marginal effects. These can be interpreted in the same way as marginal effects in a linear regression model. However, care should be taken as this interpretation of marginal effects is only valid on average.

5.1 Foreign institutional Ownership

First of all, I examine the impact of total institutional ownership. However, there is no significant relationship between total institutional ownership and cross-border M&As. I delve deeper into institutional investors by considering their country of origin. The analysis of foreign institutional investors shows that the average marginal effect of foreign institutional ownership is positive and significant at the 1% level, which is consistent with hypothesis 1 that acquiring firms with a larger proportion of foreign institutional ownership are more likely to engage in cross-border M&As. The average marginal effect of foreign institutional ownership is also economically significant. An increase of 1% in foreign institutional ownership increases, on average, the probability that an M&A is cross-border with 0.4%. The presence of domestic institutional investors, however, reduces the probability of a cross-border takeover. There is a negative and significant relationship at the 5% level. An increase of 1% in domestic institutional ownership reduces, on average, the probability that an M&A is cross-border with 0.2%[1].

My finding of no significant relationship between total institutional ownership and cross-border M&As is surprising, as the study of Andriosopoulos and Yang (2015) finds a positive relationship. However, when I differentiate

[1]In unreported analyses I conduct the analyses again with a variety of combinations of control variables. The main results are unaffected.

Table 9: Probit Analysis of Euro Area Acquirers engaging in cross-border M&As

This table reports the results of probit regressions for estimating the probability of Euro area acquirers deciding to engage in cross-border M&As. Instead of displaying the coefficients of the probit model, the table reports the average marginal effects as these values are easier to interpret (Wooldridge, 2010). Standard errors are clustered on the firm level and reported in parentheses. All variable definitions can be found in table 3.

	1	2	3	4	5
Total institutional ownership	0.001				
	(0.001)				
Foreign institutional ownership		0.004***			
		(0.001)			
Domestic institutional ownership			-0.002***		
			(0.001)		
Largest institutional investor				-0.001	
				(0.001)	
Top 5 institutional ownership					0.000
					(0.001)
Log firm size	0.022	0.024	0.018	0.019	0.021
	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
Leverage	0.068	0.058	0.072	0.076	0.071
	(0.114)	(0.111)	(0.116)	(0.116)	(0.115)
ROA	-0.003	-0.004	-0.003	-0.003	-0.003
	(0.003)	(0.002)	(0.003)	(0.003)	(0.003)
Cash & Equivalent	0.301*	0.285*	0.335*	0.323*	0.313*
	(0.167)	(0.159)	(0.172)	(0.171)	(0.170)
Intangible assets	0.383***	0.360***	0.394***	0.396***	0.391***
	(0.105)	(0.106)	(0.106)	(0.106)	(0.106)
Tobin's Q	0.043*	0.041*	0.038	0.041*	0.042*
	(0.023)	(0.022)	(0.024)	(0.024)	(0.024)
Cross industry	0.028	0.029	0.027	0.027	0.027
	(0.037)	(0.037)	(0.037)	(0.037)	(0.037)
Listed target	0.066	0.075	0.069	0.068	0.065
	(0.101)	(0.096)	(0.103)	(0.103)	(0.102)
Initial stake	-0.149***	-0.137***	-0.150***	-0.152***	-0.152***
	(0.046)	(0.046)	(0.046)	(0.046)	(0.046)
Share payment	-0.230***	-0.216***	-0.245***	-0.242***	-0.237***
	(0.053)	(0.051)	(0.053)	(0.053)	(0.053)
M&A Experience	0.036	0.032	0.033	0.036	0.036
	(0.039)	(0.038)	(0.039)	(0.039)	(0.039)
Industry controls	✓	✓	✓	✓	✓
Country controls	✓	✓	✓	✓	✓
N	590	590	590	590	590
Pseudo R^2(%)	15.59	17.31	16.09	15.52	15.44
Wald chi^2	109.01	121.06	111.10	106.90	107.25
p value Wald test	0.000	0.000	0.000	0.000	0.000
Correctly classified (%)	74.92	75.08	75.42	75.08	74.92

***p <0.01, **p<0.05, *p<0.10

between foreign institutional investors and domestic institutional investors, my significant finding of foreign institutional ownership is consistent with previous research. Andriosopoulos and Yang (2015) study the impact of institutional investors on M&A engagement in the UK and find that foreign institutional ownership at acquiring firms has positive and significant effect on the probability of M&As being cross-border. Ferreira et al. (2010) provide similar results in their large worldwide sample. My findings show that foreign institutional investors are apt to cross-border M&As while they have substantial influence on corporate strategies and long-term decisions (Brooks et al., 2018).

My results suggest that rather the country of origin of institutional investors is of importance, as there is a substantial difference between foreign institutional investors and domestic institutional investors. First of all, foreign institutional investors can reduce bargaining and transactions costs as a result of the information asymmetry between acquirers and targets in cross-border deals. Moreover, if foreign institutional investors have an initial stake in the target, they can bridge the information gap between the foreign acquirer and target firm (Ferreira et al., 2010). On the other hand, domestic shareholders are less likely to engage in cross-border M&As, as they prefer domestic shares or have a familiarity bias (Coval & Moskowitz, 2001; Grinblatt & Keloharju, 2001). The second reason could be found in that managers of domestic institutional investors are likely to have stronger business ties to domestic firms, share the gains of control, and are more friendly to incumbent managers (Gillan & Starks, 2003; Stulz, 2005; G. F. Davis & Kim, 2007). On the other hand, Ferreira et al. (2010) argue that foreign institutional investors have less ties with managers and less personal benefits. Therefore, they can support in considering foreign M&A bids.

When I look at the control variables, I find that a cross-border M&A is more likely to occur when the acquirer has a higher level of intangible assets, which is consistent with the hypothesis of Surroca et al. (2010), who argue that a firm's intangible assets are key in creating competitive advantage and value creation. Surprisingly, I find that when the acquirer already has an initial stake in the target firm, they are less likely to engage in a cross-border deal. Burkart (1995) suggests that an initial stake may result in overbidding, which could lead to a loss for the acquirer. Furthermore, the analysis on the payment method shows that a payment in shares reduces the probability of a cross-border M&A. Carow et al. (2004) argue that acquirers who find

undervalued targets or targets with potential synergies are more likely to use cash rather than shares as a form of payment because it reduces the likelihood of offers from competitors. Moreover, when the acquisition is successful and it is revealed in the capital market, existing shareholders gain the most benefits. Finally, firms that have growth opportunities are more likely to engage in a cross-border deal, which is consistent with the result of Goranova et al. (2010).

5.2 Block institutional Ownership

Furthermore, I examine the impact of blockholders, in order to check if there is an increased effect. I find an insignificant relationship between the largest institutional investor and the probability of a cross-border M&A. When I replace the largest institutional investor with top 5 institutional ownership, the sign of the average marginal effects becomes positive but remains insignificant. Hence, I reject hypothesis 2 that acquiring firms with a higher concentration of institutional ownership have a higher probability to engage in cross-border M&As[2].

My insignificant results of block institutional ownership and the decision to engage in cross-border deals contradict previous research. Andriosopoulos and Yang (2015) examine the total ownership of the 5 largest institutional investors. They find that these blockholders positively affect the decision to engage in cross-border M&As. Ferreira et al. (2010) examine foreign institutional investors with more than 5% of the shares relative to the firms market capitalization. They find that these blockholders have a positive effect on the decision to engage in cross-border M&As. The fact that I have not been able to find a significant effect for block institutional investors seems to suggest that the country of origin has an effect rather than the degree of concentrated institutional ownership.

5.3 Robustness Analysis

In order to assess the robustness of the results, I replace the probability of a cross-border M&A as a dependent variable by the probability of a domestic M&A. The results are displayed in appendix F. As expected, the average marginal effects of foreign institutional ownership and domestic institutional

[2]In unreported analyses I conduct the analyses again with a variety of combinations of control variables. The main results are unaffected.

ownership are opposed to that of the former analysis. Foreign institutional ownership has a negative relationship with the probability of a domestic M&A at the 1% level, while domestic institutional ownership has a positive relationship with the probability of a domestic M&A at the 5% level. The average marginal effects of total institutional ownership and the two measures of block institutional ownership remain insignificant.

Furthermore, I consider the size of the M&A to investigate whether this results in differences. I break up the sample in a sample of large M&As with a value of 1 million euros and higher and a sample of small M&As with a value lower than 1 million euros. Table 10 shows the results of the sample with large M&As. In contrast to the main analysis, total institutional ownership yields a positive and significant average marginal effect at the 5% level. Foreign institutional ownership remains significant, while domestic institutional ownership becomes insignificant. Moreover, the relationship between top 5 institutional ownership and a cross-border M&A becomes significant at the 5% level. Table 11 shows the results of the sample with small M&As. In comparison to the main analysis, the average marginal effects of the ownership variables show similar significance levels. The average marginal effect of total institutional ownership remains insignificant, while foreign institutional ownership has a positive and significant relationship with a cross-border M&A at the 1% level. Domestic institutional ownership has a negative and significant relationship with a cross-border M&A at the 1% level. The average marginal effects of largest institutional investor and top 5 institutional ownership remain insignificant.

The contrasting results of the two sub-samples show that institutional investors have, in the case of engagement in cross-border M&As, more impact in larger deals. Hessel and Norman (1992) argue that institutional investors prefer to buy stakes in larger firms that have low information asymmetries and are financially reliable, while they can engage in large M&A deals. The reason why institutional investors have more impact on engagement in cross-border M&As through larger deals is unclear in the financial literature. Future research should therefore investigate this assumption.

Finally, I conduct the same analysis for the northern and southern part of the euro area. The European north-south divide has been the subject of a long ongoing discussion. Despite the formation of the Economic and Monetary union, longstanding economical differences still remain and frequently

Table 10: Probit Analysis of Euro Area Acquirers engaging in large M&As

This table reports the results of probit regressions for estimating the probability of Euro area acquirers deciding to engage in cross-border M&As with a deal value of 1 million euros and higher. Instead of displaying the coefficients of the probit model, the table reports the average marginal effects as these values are easier to interpret (Wooldridge, 2010). Standard errors are clustered on the firm level and reported in parentheses. All variable definitions can be found in table 3.

	1	2	3	4	5
Total institutional ownership	0.003**				
	(0.001)				
Foreign institutional ownership		0.005***			
		(0.002)			
Domestic institutional ownership			0.000		
			(0.002)		
Largest institutional investor				0.002	
				(0.003)	
Top 5 institutional ownership					0.004**
					(0.002)
Firm size	-0.028	-0.038	-0.054*	-0.047*	-0.032
	(0.033)	(0.030)	(0.029)	(0.028)	(0.031)
Leverage	-0.163	-0.189	-0.168	-0.156	-0.149
	(0.197)	(0.169)	(0.206)	(0.214)	(0.207)
ROA	-0.001	-0.002	0.000	0.000	-0.001
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Cash & Equivalent	0.365	0.314	0.321	0.350	0.357
	(0.321)	(0.283)	(0.325)	(0.342)	(0.336)
Intangible assets	0.462**	0.449**	0.456**	0.480**	0.475**
	(0.227)	(0.216)	(0.224)	(0.223)	(0.230)
Tobin's Q	-0.053	-0.060	-0.054	-0.057	-0.052
	(0.050)	(0.052)	(0.055)	(0.054)	(0.051)
Cross industry	0.061	0.079	0.069	0.060	0.056
	(0.064)	(0.062)	(0.066)	(0.068)	(0.065)
Listed target	0.104	0.129	0.091	0.091	0.096
	(0.190)	(0.179)	(0.177)	(0.180)	(0.191)
Initial stake	-0.287***	-0.282***	-0.262***	-0.266***	-0.280***
	(0.094)	(0.091)	(0.085)	(0.087)	(0.092)
Share payment	-0.217**	-0.185*	-0.231**	-0.230**	-0.218**
	(0.093)	(0.095)	(0.099)	(0.095)	(0.093)
M&A experience	0.051	0.048	0.085	0.079	0.061
	(0.062)	(0.061)	(0.066)	(0.065)	(0.062)
Industry controls	✓	✓	✓	✓	✓
Country controls	✓	✓	✓	✓	✓
N	124	124	124	124	124
Pseudo R^2(%)	32.40	33.56	29.02	29.40	31.33
Wald chi^2	48.56	75.82	37.38	36.20	40.72
p value Wald test	0.000	0.000	0.003	0.004	0.001
Correctly classified (%)	85.48	86.29	85.48	86.29	85.48

***p <0.01, **p<0.05, *p<0.10

Table 11: Probit Analysis of Euro Area Acquirers engaging in small M&As

This table reports the results of probit regressions for estimating the probability of Euro area acquirers deciding to engage in cross-border M&As with a deal value lower than 1 million euros. Instead of displaying the coefficients of the probit model, the table reports the average marginal effects as these values are easier to interpret (Wooldridge, 2010). Standard errors are clustered on the firm level and reported in parentheses. All variable definitions can be found in table 3.

	1	2	3	4	5
Total institutional ownership	-0.000				
	(0.001)				
Foreign institutional ownership		0.003***			
		(0.001)			
Domestic institutional ownership			-0.002***		
			(0.001)		
Largest institutional investor				-0.001	
				(0.001)	
Top 5 institutional ownership					-0.001
					(0.001)
Firm size	0.028*	0.031**	0.026	0.026*	0.026
	(0.015)	(0.015)	(0.015)	(0.016)	(0.016)
Leverage	0.123	0.109	0.125	0.137	0.129
	(0.137)	(0.133)	(0.141)	(0.140)	(0.139)
ROA	-0.003	-0.004	-0.003	-0.003	-0.003
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Cash & Equivalent	0.341*	0.310	0.381*	0.363*	0.358*
	(0.199)	(0.192)	(0.206)	(0.204)	(0.202)
Intangible assets	0.397***	0.361***	0.401***	0.408***	0.406***
	(0.116)	(0.117)	(0.116)	(0.117)	(0.116)
Tobin's Q	0.049	0.051*	0.045	0.049	0.047
	(0.030)	(0.028)	(0.030)	(0.030)	(0.030)
Cross industry	0.010	0.013	0.006	0.006	0.008
	(0.042)	(0.041)	(0.042)	(0.042)	(0.042)
Listed target	0.108	0.111	0.113	0.116	0.111
	(0.098)	(0.093)	(0.099)	(0.100)	(0.100)
Initial stake	-0.119**	-0.104*	-0.117**	-0.120**	-0.121**
	(0.054)	(0.054)	(0.055)	(0.055)	(0.055)
Share payment	-0.277***	-0.253***	-0.292***	-0.287***	-0.285***
	(0.067)	(0.065)	(0.065)	(0.067)	(0.067)
M&A experience	0.005	0.007	-0.000	0.004	0.004
	(0.045)	(0.045)	(0.044)	(0.044)	(0.044)
Industry controls	✓	✓	✓	✓	✓
Country controls	✓	✓	✓	✓	✓
N	459	459	459	459	459
Pseudo R^2(%)	15.91	17.21	17.17	16.26	16.05
Wald chi^2	86.12	92.38	93.69	87.12	86.08
p value Wald test	0.000	0.000	0.000	0.000	0.000
Correctly classified (%)	72.98	73.64	75.82	73.86	73.64

***p <0.01, **p<0.05, *p<0.10

cause a conflict in Europe[3]. The main point of arguments is the distinction between two fundamentally different macroeconomic growth economies. While northern euro area countries such as Germany, the Netherlands, and Finland are built on institutions and policies that encourage export, the economies of southern euro area countries such as Spain, Portugal, and Italy are focused on domestic consumption (Regan, 2017). Moreover, the northern countries have, on average, a gross domestic product per capita that is 31% higher than that of the southern countries (OECD, 2020). It is therefore interesting to investigate whether these economic disparities also cause differences in the context of cross-border M&As between the north and south euro area.

Table 12 and table 13 report the results of the probit regressions for the northern and southern euro area sub-sample respectively. Table 12 shows that for the northern region the average marginal effect of domestic institutional ownership becomes insignificant, it becomes significant for top 5 institutional ownership at the 10% level. More surprisingly, there is a positive and significant relationship at the 5% level between total institutional ownership and the probability of a cross-border M&A. In contrast, for the southern region the average marginal effect of foreign institutional ownership drops to the 10% level and the average marginal effects of the largest institutional investor and the top 5 institutional ownership are negative and significant at the 1% and 10% level respectively. There is a negative and significant relationship at the 10% level between total institutional ownership and the probability of a cross-border M&A.

In general, I find that the results for the northern countries are more in line with the complete sample results than those of the southern countries. Of course, this is to be expected as the northern states comprise the majority of the sample, but interestingly it appears as if institutional ownership in the southern states has an overall negative effect on cross-border M&As. This surprising north-south difference is may be a result of a difference in domestic ownership. Firms in northern Europe are on average for 9.6% owned by domestic institutional investors. In the south, this percentage is nearly twice as large with an average domestic ownership of 16.7%. Previous research has shown that domestic investors suffer from home bias and they are therefore more likely to avoid cross-border M&As. When the level of domestic own-

[3]Currently EU member states are still trying to find a compromise in dealing with the economic downfall due to the coronavirus pandemic (BBC, 2020).

Table 12: Probit Analysis of northern Euro Area Acquirers engaging in cross-border M&As

This table reports the results of probit regressions for estimating the probability of Euro area acquirers deciding to engage in cross-border M&As. Instead of displaying the coefficients of the probit model, the table reports the average marginal effects as these values are easier to interpret (Wooldridge, 2010). Standard errors are clustered on the firm level and reported in parentheses. All variable definitions can be found in table 3. The northern countries include Austria, Belgium, Finland, France, Germany, Ireland, Luxembourg, and the Netherlands.

	1	2	3	4	5
Total institutional ownership	0.002**				
	(0.001)				
Foreign institutional ownership		0.003***			
		(0.001)			
Domestic institutional ownership			-0.001		
			(0.001)		
Largest institutional investor				-0.002	
				(0.001)	
Top 5 institutional ownership					0.002*
					(0.001)
Log firm size	0.006	0.009	0.001	0.003	0.005
	(0.017)	(0.017)	(0.015)	(0.017)	(0.017)
Leverage	0.107	0.104	0.114	0.106	0.105
	(0.114)	(0.112)	(0.116)	(0.117)	(0.115)
ROA	-0,004	-0.004	-0.003	-0.003	-0.003
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Cash & Equivalent	0.223	0.262	0.272	0.233	0.216
	(0.169)	(0.169)	(0.174)	(0.173)	(0.171)
Intangible assets	0.355***	0.365***	0.378***	0.367***	0.356***
	(0.107)	(0.109)	(0.106)	(0.107)	(0.107)
Tobin's Q	0.047**	0.050**	0.050**	0.052**	0.050**
	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)
Cross industry	0.069*	0.071*	0.074*	0.071*	0.035*
	(0.039)	(0.039)	(0.037)	(0.039)	(0.037)
Listed target	-0.082	-0.072	-0.085	-0.093	-0.089
	(0.104)	(0.103)	(0.103)	(0.106)	(0.105)
Initial stake	-0.130***	-0.120***	-0.135***	-0.135***	-0.134***
	(0.047)	(0.046)	(0.047)	(0.047)	(0.047)
Share payment	-0.188***	-0.176***	-0.193***	-0.193***	-0.190***
	(0.063)	(0.063)	(0.057)	(0.063)	(0.063)
M&A experience	0.080**	0.074*	0.080*	0.079*	0.078**
	(0.039)	(0.040)	(0.039)	(0.039)	(0.039)
Industry controls	✓	✓	✓	✓	✓
Country controls	✓	✓	✓	✓	✓
N	466	466	466	466	466
Pseudo R^2(%)	15.02	15.94	14.13	14.37	14.78
Wald chi^2	69.61	74.63	67.26	68.67	69.61
p-value Wald test	0.000	0.000	0.000	0.000	0.000
Correctly classified(%)	80.26	80.04	80.04	79.83	79.83

***p <0.01, **p<0.05, *p<0.10

Table 13: Probit Analysis of southern Euro Area Acquirers engaging in cross-border M&As

This table reports the results of probit regressions for estimating the probability of Euro area acquirers deciding to engage in cross-border M&As. Instead of displaying the coefficients of the probit model, the table reports the average marginal effects as these values are easier to interpret (Wooldridge, 2010). Standard errors are clustered on the firm level and reported in parentheses. All variable definitions can be found in table 3. The southern countries include Cyprus, Greece, Italy, Malta, Portugal, Spain, and Slovenia.

	1	2	3	4	5
Total institutional ownership	-0.003*				
	(0.002)				
Foreign institutional ownership		0.006*			
		(0.003)			
Domestic institutional ownership			-0.005***		
			(0.002)		
Largest institutional investor				-0.007***	
				(0.002)	
Top 5 institutional ownership					-0.005*
					(0.002)
Log firm size	-0.010	-0.019	-0.060	-0.022	-0.014
	(0.038)	(0.035)	(0.122)	(0.037)	(0.038)
Leverage	-0.017	-0.042	-0.112	0.038	0.014
	(0.339)	(0.319)	(1.070)	(1.102)	(0.331)
ROA	0.006	-0.001	-0.014	0.014	0.005
	(0.006)	(0.006)	(0.020)	(0.020)	(0.006)
Cash & Equivalent	0.155	0.014	0.275	0.466	0.143
	(0.594)	(0.571)	(1.900)	(1.958)	(0.587)
Intangible assets	0.465**	0.243	1.280**	1.614**	0.467**
	(0.199)	(0.218)	(0.643)	(0.657)	(0.190)
Tobin's Q	0.023	0.053	0.067	0.103	0.022
	(0.053)	(0.053)	(0.171)	(0.182)	(0.053)
Cross industry	-0.064	-0.024	-0.212	-0.211*	-0.061*
	(0.076)	(0.084)	(0.246)	(0.240)	(0.073)
Listed target	0.310**	0.351	1.037**	1.042**	0.308**
	(0.151)	(0.140)	(0.497)	(0.516)	(0.146)
Initial stake	-0.130	-0.120	-0.135	-0.135	-0.134
	(0.047)	(0.046)	(0.047)	(0.047)	(0.047)
Share payment	-0.527***	-0.435***	-1.718***	-0.744***	-0.522***
	(0.140)	(0.135)	(0.508)	(0.543)	(0.135)
M&A experience	-0.051	-0.050	-0.124	-0.171	-.044
	(0.110)	(0.110)	(0.355)	(0.354)	(0.039)
Industry controls	✓	✓	✓	✓	✓
Country controls	✓	✓	✓	✓	✓
N	123	123	123	123	123
Pseudo R^2(%)	22.29	22.24	24.64	25.89	23.52
Wald chi^2	25.66	30.64	30.44	30.42	27.54
p-value Wald test	0.140	0.044	0.046	0.047	0.093
Correctly classified(%)	71.54	75.61	71.54	72.36	70.73

***p <0.01, **p<0.05, *p<0.10

ership is added as a control variable in the probit regressions, I indeed find that the difference in the effect of institutional ownership between the northern and southern states diminishes. Aside from the different levels of domestic ownership, the north-south difference may be the result of macroeconomic disparities. The export oriented and wealthy northern economies form a stable environment for stimulating cross-border M&As, while the southern economies that are less wealthy and more focused on the domestic market make it less likely for firms in this area to engage in cross-border M&As. However, future research is desirable to explore these differences in depth.

Thus overall, I do find different effects in sub-regions of Europe. However, these differences can be accounted for by macroeconomic disparities and sample specific characteristics. Therefore, I conclude that the main results in sections 5.1 and 5.2 are robust in the sense that they persist across the two major sub-regions of Europe.

5.4 Probit Model Evaluation

In order to determine the reliability of the results in the previous sections, I consider several regression diagnostic exercises to assess the fit and performance of the model underlying table 9. Appendix D shows the variance inflation factor (VIF) for the covariates. VIFs show the extent to which there is a violation of the multicollinearity assumption. Hair et al. (1998) argue that a VIF larger than 10 indicates multicollinearity, while Ringle, Wende, and Becker (2015) consider VIFs over 5 to be problematic. The VIFs in appendix D are below the threshold, hence multicollinearity poses no problem in my analysis.

The conventional goodness-of-fit measure, the R^2, is not defined for the probit model. Several alternatives have been proposed, of which McFadden's pseudo R^2 is most often used. McFadden and Zarembka (1974) introduced the following measure

$$R^2_{McFadden} = 1 - \frac{\log(L_c)}{\log(L_{null})}$$

where L_c denotes the (maximized) likelihood value from the current fitted model, and L_{null} denotes the corresponding value but for the null model - the model with only an intercept and no covariates. Unlike the conventional R^2 that can be interpreted as the proportion of the variability in the dependent

variable that is explained by model, McFadden's pseudo R^2 measures are relative measures among similar models indicating how well the model explains the data. McFadden et al. (1977) suggest that pseudo R^2 values between 0.2 and 0.4 represent an excellent fit. Considering that my pseudo R^2 values are between 0.1604 and 0.1790, I conclude that my models have a reasonable fit. In addition, the Wald test shows that I included statistically significant predictors in my models, hence leading to a better model fit.

A different method to measure the performance of a probability model is to turn a probability model into a classification model. The confusion matrix in appendix E compares the actual values of the dependent variable and the model predictions. In the construction of the table, predicted probabilities larger than 0,5 are classified as cross-border M&As and probabilities smaller than 0,5 are classified as domestic M&As. I use the accuracy metric in order to assess whether the model is able to accurately classify the M&As. This metric is essentially the fraction of M&As that are correctly classified, for my model the accuracy is 75.59% which can be considered a good performance. As a comparison, a model that randomly classifies M&As would attain an accuracy of 50%.

6 Conclusion

In this research I attempt to examine the impact of institutional investors on M&As conducted by euro area acquirers. The results show that there is no evidence for a relationship between total institutional ownership and cross-border M&A deals. As only measuring the overall institutional ownership gives a general impression, I also differentiate between institutional investors to take their different characteristics and investment styles into account. Therefore, I consider nationality, i.e. domestic vs. foreign, and ownership concentration, i.e. blockholdings. I find that foreign institutional investors increase the probability of an M&A being cross-border. However, I find no evidence that block institutional investors influence the choice between a cross-border or domestic M&A. My main conclusion is that country of origin of institutional investors does make an impact rather than the degree of concentrated institutional ownership.

These findings have important implications for managers, as the country of origin of the firm's institutional owners appears to be essential in the extent to which strategic decisions are influenced. Furthermore, it shows how foreign institutional investors can affect internationalisation of their target firms. The finding of foreign institutional investors that increase the probability of an M&A being cross-border are in line with the reasoning of Ferreira et al. (2010) that institutional investors are able to perform a facilitating role in the M&A market by reducing transaction costs and information asymmetry between an acquirer and foreign target.

My findings of significant effects when I examine the country of origin of institutional investors and no effects of total institutional ownership and ownership concentration lie open for further investigation. It seems that while foreign institutional investors increase the probability of a cross-border M&A, domestic institutional investors mitigate this effect when I examine concentration of institutional investors, indicating that concentration is of less importance than country of origin. I suggest two cautious explanations for these results. First, inherent to being foreign, foreign institutional investors could be more likely to influence the decision to engage in an international M&A and ease this process. In contrast, domestic institutional investors could be more likely to be home biased and prefer local stocks. Second, domestic institutional investors are more likely to have strong business ties to domestic

firms and incumbent managers and engaging in cross-border M&As may distort these relationships. For foreign institutional investors, who are likely to have less ties with firm management, this does not pose a problem.

I also consider the size of the M&A and the European economic north-south divide in sub-sample analyses. My results show that institutional investors have more impact on engagement in cross-border M&As through larger deals. Moreover, the results of my north-south euro area analysis show that in the northern countries institutional investors have a positive effect on engagement in cross-border M&As, while for the southern countries this effect is opposite. As these findings are relatively untouched in the financial literature, they may constitute the objects of future studies.

Due to data limitations, I only examine only institutional investors in general and I do not take different types of institutional investors, for example pension funds or mutual funds, into account. As institutional investors vary in their purpose and each type of investor has to comply with unique legal rules, it may cause differences in the extent to which they can affect strategic firm decisions. This is therefore an interesting topic for future research. Furthermore, I do not examine the nationality of the top 5 institutional investors and the largest institutional investor due to data limitations. Future research should therefore also consider whether nationality of blockholders plays an important role in M&A engagement.

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A Instruments Relevance

Table 14: Instruments Relevance

This table reports the results of the F-test on the coefficients of the 7 instruments in the first-stage regression. Models 1-5 regress respectively the variables foreign institutional ownership, domestic institutional ownership, largest institutional investor, top 5 institutional investors, and total institutional ownership.

	(1)	(2)	(3)	(4)	(5)
Voice and Accountability	-2,466	5,050**	3,655***	3,600	2,584
	(2,160)	(2,687)	(2,049)	(2,661)	(3,092)
Political Stability	.818	4,103**	3,986**	4,245**	4,922**
	(2,314)	(2,103)	(1,661)	(2,187)	(2,889)
Government Effectiveness	-0,859	3,017	2,427	4,465	3,876
	(8,020)	(5,874)	(5,109)	(6,411)	(8,106)
Regulatory Quality	3,657	1,765	5,802	5,588	5,422
	(4,011)	(4,980)	(4,099)	(4,747)	(5,632)
Rule of Law	-0,413	-16,070***	-12,728**	-1,671***	-16,484**
	(6,057)	(5,234)	(5,443)	(6,196)	(7,365)
Control of Corruption	-0,418	3,170	-0,684	1,389	2,752
	(4,001)	(3,513)	(3,134)	(3,892)	(4,969)
Active market	-15,979	-18,173	-5,240	-21,743	-34,152
	(33,131)	(25,817)	(22,619)	(26,769)	(35,388)
Constant	18,048***	15,076***	12,124***	23,791***	33,124***
	(3,911)	(2,678)	(2,127)	(2,892)	(3,841)
N	578	578	578	578	578
F	0,450	2,440	1,850	1,570	1,150
R^2	0,007	0,039	0,041	0,031	0,018

***p <0,01, **p<0,05, *p<0,10

B Deals relative to Stock Market Capitalization

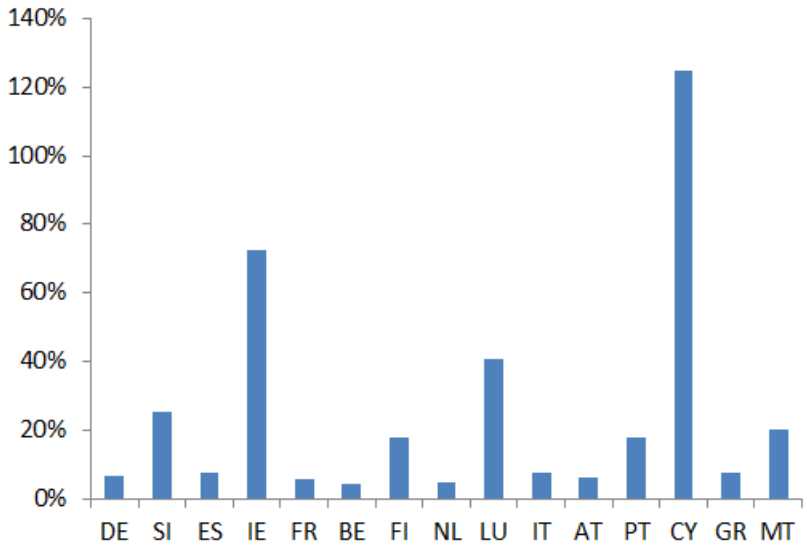

Figure 2: Number of Deals relative to Stock Market Capitalization

This figure visualizes the total number of completed M&A deals for each country relative to the respective stock market capitalization of each country between 2011 and 2019. The stock market capitalization was measured in billion euros.

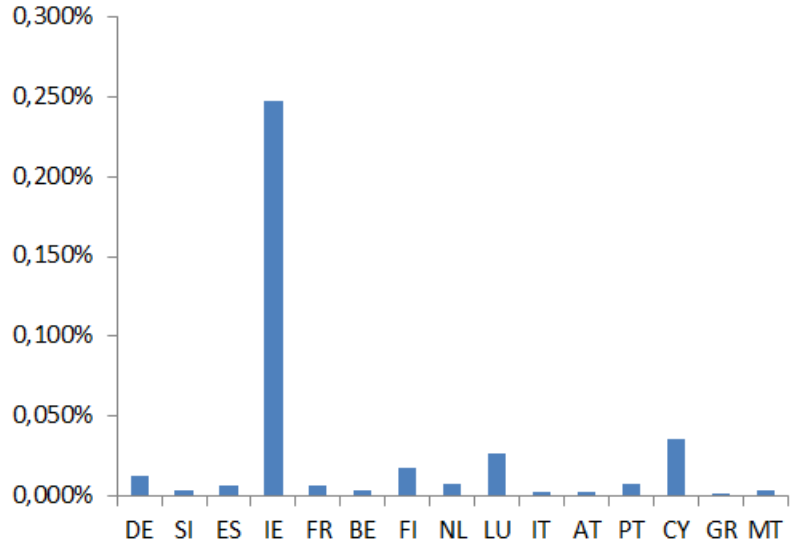

Figure 3: Deal Size relative to Stock Market Capitalization

This figure visualizes the total deal size of completed M&A deals for each country relative to the respective stock market capitalization of each country between 2011 and 2019.

C Cook's Distances

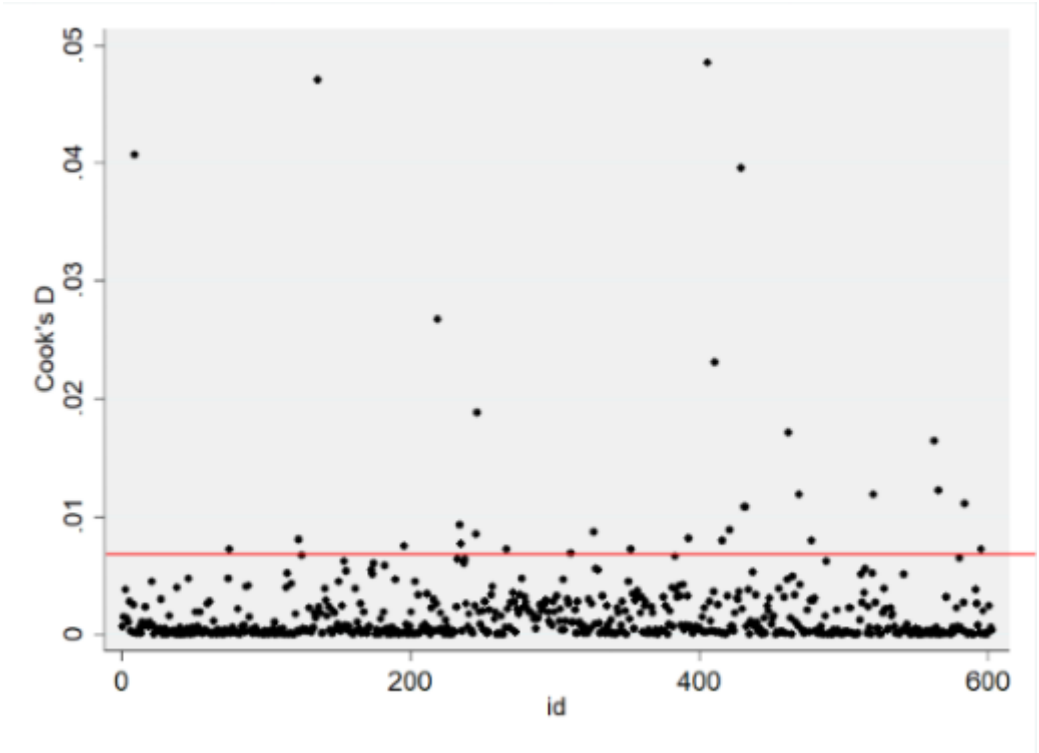

Figure 4: Cook's distances

D Domestic M&As

Table 15: Probit Analysis of Euro Area Acquirers engaging in domestic M&As

This table reports the results of probit regressions for estimating the probability of Euro area acquirers deciding to engage in domestic M&As. Instead of displaying the coefficients of the probit model, the table reports the average marginal effects as these values are easier to interpret (Wooldridge, 2010). All variable definitions can be found in table 3. Clustered robust standard errors are not reported for brevity.

	1	2	3	4	5
Total institutional ownership	-0.001				
Foreign institutional ownership		-0.004***			
Domestic institutional ownership			0.002**		
Largest institutional investor				0.001	
Top 5 institutional investors					-0.001
Log firm size	-0.022	-0.024*	-0.017	-0.019	-0.021
Leverage	-0.068	-0.058	-0.072	-0.076	-0.071
ROA	0.003	0.003	0.003	0.003	0.003
Cash & Equivalent	-0.301*	-0.285*	-0.335*	-0.323*	-0.314*
Intangible assets	-0.383***	-0.360***	-0.394***	-0.396***	-0.391***
Tobin's Q	-0.043*	-0.041*	-0.038	-0.041*	-0.042*
Cross industry	-0.028	-0.029	-0.027	-0.026	-0.027
Listed target	-0.066	-0.075	-0.069	-0.068	-0.065
Initial stake	0.148***	0.136***	0.150***	0.152***	0.151***
Share payment	0.229***	0.216***	0.245***	0.242***	0.237***
M&A Experience	-0.035	-0.032	-0.033	-0.036	-0.035

E VIFs

Table 16: VIFs

This table reports the VIFs of the coefficients in the different models. Models 1-5 regress respectively the variables foreign institutional ownership, domestic institutional ownership, largest institutional investor, top 5 institutional investors, and total institutional ownership.

Coefficient	1	2	3	4	5
Foreign institutional ownership	1.11				
Domestic institutional ownership		1.15			
Largest institutional investor			1.14		
Top 5 institutional investors				1.17	
Total institutional ownership					1.14
Initial stake	1.35	1.34	1.34	1.35	1.35
Cash & Equivalent	1.45	1.45	1.45	1.46	1.45
Cash payment	1.15	1.14	1.14	1.15	1.15
Cross industry	1.09	1.09	1.09	1.09	1.09
Intangible assets	1.42	1.40	1.40	1.41	1.41
Industry1	1.12	1.15	1.14	1.15	1.14
Industry3	1.30	1.30	1.31	1.31	1.30
Industry4	1.08	1.17	1.16	1.14	1.12
Industry5	1.12	1.12	1.12	1.13	1.12
industry6	1.31	1.32	1.32	1.32	1.32
industry7	1.17	1.16	1.16	1.17	1.17
industry8	1.10	1.10	1.10	1.11	1.11
Deal value	1.32	1.33	1.32	1.31	1.31
Leverage	1.34	1.34	1.34	1.34	1.34
Listed target	1.17	1.17	1.17	1.17	1.17
Firm size	2.16	2.12	2.15	2.17	2.16
M&A Experience	1.31	1.32	1.31	1.31	1.31
Tobin's Q	1.84	1.84	1.84	1.84	1.84
ROA	1.39	1.38	1.38	1.38	1.39
Share payment	1.29	1.27	1.28	1.29	1.29

F Confusion Matrix

Table 17: Confusion Matrix

		Actual		
		Cross-border	Domestic	Total
Predicted	Cross-border	400	111	511
	Domestic	33	46	79
	Total	433	157	590