Determinants of Cross-Border Mergers & Acquisitions

An explorative study

MSc. International Economics & Business

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Abstract

Ever since the first wave of Cross-border Mergers & Acquisitions (M&A's) introduced the world to the large deal values and subsequent impact on the world economy, research on the topic has tried to give society more insight into the different sides of the phenomenon. Through a Heckman Sample Selection Estimated gravity model, this research expands on the existing body of literature by taking a macroeconomic perspective, by analyzing the importance of different variables from both the acquirer- and target perspective, and by incorporating the effect of human- and physical capital on cross-border M&A's. I find robust evidence of a relationship between certain bilateral, financial, institutional, openness, and macroeconomic variables and cross-border M&A's. I also find evidence of a relationship between human- and physical capital and cross-border M&A's, though this relationship is not robust to industry level tests.

Keywords: Cross-border; Mergers & Acquisitions; Gravity model; Factors of Production; Human Capital; Physical Capital

Preface

This thesis is the finalization of the Master of Science International Economics and Business at Utrecht University. The result is this study, in which I unravel the *ins & outs* of cross-border mergers and acquisitions at the macroeconomic level. The skills on which this thesis is built have been learned at Utrecht University through my Bachelor of Science in Human Geography, my minor in International Economics, and my Master of Science International Economics and Business.

By adding the Mergers, Acquisitions & Restructuring to my MSc. curriculum I have learned a lot about the different aspects that make Mergers and Acquisitions such an interesting and exciting subject; having the honor to contribute to one of the least studied topics of this subject – macroeconomic determinants of mergers and acquisitions – is a great way to end my Master of Science.

Matt Vorachen
Utrecht, July 2016

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[I] Introduction

When Mannesmann's CEO Klaus Esser set his sights on British mobile phone operator Orange in October 1999, no one could have predicted that Mannesmann would become the target in one of the largest Mergers & Acquisitions (M&A) in history only a few months later. As soon as word got out that Mannesmann itself might be ripe for plucking, the world's largest mobile operator Vodafone Airtouch made an offer for 100 billion euros and soon pushed this bid to 125 billion euros. Esser tried convincing Mannesmann's shareholders that the growth prospects of the firm were good and that Mannesmann held a technical supremacy over Vodafone, but despite the charm offensive to shareholders they opted on agreeing the merger (Edmonds, 2010). On February 3, 2000 Vodafone's Chris Ghent and Mannesmann's Klaus Esser shook hands to seal the Vodafone-Mannesmann deal. The bid eventually turned out as high 180 billion dollars (Naik, 2000).

The above example shows what a dynamic subject M&A is at the level of the firm, and it is just as dynamic at the macroeconomic level. One of the striking patterns of M&A's is that they come in waves, a pattern that goes back as far as 1890, when the first "merging for monopoly" wave took place (Sudarsanam, 2010). However, the first cross-border M&A wave - in which the Vodafone-Mannesmann deal took place – peaked in 2000. What followed in the sixteen years after this wave and Vodafone-Mannesmann merger was a decline of cross-border M&A activity followed by a large increase in the number of cross-border M&A's (Evenett, 2004). Di Giovanni stated in 2003 that the 1990s witnessed an explosion in cross-border M&A's, but the real explosion came years later. If we compare 1990 with 2007 we see a shift in cross-border M&A activity from 200 billion US dollars in 1990 to 1.637 billion US dollars in 2007. The global economic crisis had its adverse effects on cross-border M&A's from 2007 onwards, but Baker & McKenzie stated that 2015 has been a record-breaking year for cross-border M&A's post-financial crisis, indicating that the cross-border M&A trend of the last twenty years is not coming to an end (Baker & McKenzie, 2016).

When we look at these figures relative to GDP, cross-border M&A's have shifted from 0.1% of world GDP in 1990 to 3% of world GDP in 2007 (Sudarsanam, 2010)[1]. It is therefore becoming the prime factor in Foreign Direct Investment Flow. Despite these figures showing the importance of cross-border M&A's on the international economic landscape, there have

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[1] Measured in absolute values. Total global deal value yearly/GDP yearly*100 (Sudarsanam, 2010).

been few studies on the (country specific) determinants of cross-border M&A's. There have been various studies analyzing the determinants between country pairs, but very few scholars have tried analyzing the specific acquirer and target country determinants in cross-border M&A activity.

Furthermore, these studies have not included industry level data and predominantly feature older datasets. This thesis will try to fill this void in the literature by answering the following question: *What are the prime bilateral and unilateral determinants for cross-border M&A's and what is the role of production factors as a determinant for cross-border M&A's?*

Existing literature gives some insights into answering the main question, but leaves other relationships ambiguous.[2] Gravity model variables such as GDP per capita (positive), distance (negative), common borders (negative), common language (positive), common currency (positive) and trade agreements (ambiguous) have been documented quite extensively. Grouped into four categories − financial, openness, institutional quality, and macroeconomic - previous studies on unilateral determinants are contradicting on the relationship between cross-border M&A's and the domestic stock market activity of the target country (financial), institutional quality of the target country (institutional), and on the exchange rate volatility of both acquirer and target country (macroeconomic). The effect of factors of production on cross-border M&A's has not been documented previously.

Through a Heckman Sample Selection estimated gravity model the relationship between the unilateral and bilateral variables and the main dependent variable (sum of deal values) is researched. The main reason for adopting a different model than OLS is to "fix" the zero gravity problem, which leaves observations with zero flows undefined and thus induces severe sample selection bias. The Heckman Sample Selection estimator not only fixes this problem/bias, but also gives insight into the relationship between the independent variables and the *probability* that two countries engage in cross-border M&A's.

The most important findings of this research are as follows: First, financial variables stock market activity (positive for the acquirer country and positive for the target country) and the role of the financial sector (positive for the acquirer country) are significant determinants in explaining both the aggregate deal value and the probability of cross-border M&A flows.

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[2] Existing literature includes Di Giovanni (2003), Brakman et.al. (2008), Bhagat et.al. (2011), Vencatachellum (2013), Wang (2008), Sudarsanam (2010), Manchin (2004), Neto & Brandao (2009), Reed & Babool (2003), Erel & Lioa (2012), Monteiro (2012), and Garita & van Marrewijk (2007).

Second, openness is mainly a determinant for explaining the aggregate deal value and probability of cross-border M&A flows for the target country (negative relationship). Third, institutional quality is positive correlated with cross-border M&A's for both acquirer and target country, in line with the governance hypothesis. Fourth, even though all macroeconomic variables used in this research are jointly significant in explaining the number and probability of cross-border M&A flows, only exchange rates (negative relationship for the target country), exchange rate volatility (negative relationship for the acquirer country), and GDP per capita (positive relationship for the acquirer country) are individually significant determinants. Fifth, human and physical capital *are* determinants of cross-border M&A's albeit in different ways. Testing this relationship for a small subsample of industries yields insignificant results. Sixth, results on bilateral gravity type variables are confirmed in this research, apart from the negative relationship between having a common currency and cross-border M&A's. This finding seems to be driven largely by the cross-border M&A dominance of Great-Britain and the USA.

The next section (two) discusses the findings of previous literature. Section three describes the data and summary statistics. Section four goes into the econometric model and the choices that have been made in estimating this model. Section five presents the results. Section six concludes this thesis.

[II] Theoretical Framework

Foreign direct investment (FDI) consists of Greenfield investments and acquisition of pre-existing foreign assets. Cross-border M&A's fall under the latter category and constitute for the bulk of FDI compared to Greenfield investments (Di Giovanni, 2003). The definition of cross-border M&A's is that in a M&A "control of assets and operations is transferred from a local to a foreign company, the former becoming an affiliate of the latter" (Brakman, et al., 2008). Most literature in this respect has focused on event studies or real value studies. The former analyzes how much shareholder value is created by the M&A through comparing the abnormal returns to an external benchmark. The latter often involves one of more cases, which are subsequently analyzed in greater detail to entangle the success or failure of the merger (Schenk, 2006).

There have been few studies analyzing cross-border M&A's at a macroeconomic, country specific level. Such an analysis could give more insight into the characteristics of countries acquiring firms from other countries or into the characteristics of countries in which the target firms are present. Considering the fact that the growth rate of FDI has surpassed the growth rates of both world GDP and world trade and that cross-border M&A's constitute for the majority of FDI, finding out more about the importance of certain characteristics of countries in the worldwide M&A-game can be of vital importance for the economy and society as a whole, especially considering the fact that most M&A's are not even creating value (Sudarsanam, 2010).

This section will present an overview of existing literature with respect to the determinants of cross-border M&A's. First, we will look at country specific determinants for the acquirer and target countries. Second, we will analyze how differences in countries' factor endowments can explain differences in cross-border M&A's. Third, we will analyze previous findings about gravity model variables, representing the relationship between certain country pairs.

2.1. Acquirer and target countries' determinants

2.1.1. *Financial determinants*

An important role in explaining what country specific characteristics matter for cross-border M&A flows in existing literature is for financial determinants. The first scholar to

search for macroeconomic determinants of cross-border M&A's was Di Giovanni (2003) who emphasizes on whether deep financial markets in the acquisition countries are positively related with cross-border M&A's. I make a distinction between two financial variables: domestic stock market activity and the role of the domestic financial sector.

There are multiple reasons for arguing that higher levels of domestic stock market activity in the acquirer country lead to more cross-border M&A activity. Vencatachellum (2013) and Wang (2008) explain the positive relationship with the expectations hypothesis: future positive expectations about the economy (as indicated through a bull market) will signal investors that good times are coming and companies expand on this by doing M&A's. Vencatachellum (2013) extends on this by arguing that buoyant domestic stocks reduce the cost of financing for investors, which stimulates M&A activity. Another reason is given by Sudarsanam (2010), who emphasizes that high levels of stock market activity might lead to overvaluation on the stock market; an overvaluation that can be used to buy real assets in the form of M&A before the overvaluation is corrected by the market. The positive relationship between stock market capitalization and the number of cross-border M&A's an acquirer country undertakes is statistically significant in Di Giovanni (2003), Manchin (2004), Neto & Brandao (2009), Reed & Babool (2003) and Vencatachellum (2013).

For the target country, the relationship between the domestic stock market and the number of cross-border M&A's is ambiguous. Manchin (2004) and Erel & Liao (2012) both feature gravity models, in which the finding is that the greater the difference in stock market performance between the two countries, the more likely that firms in the superior performing country purchase firms in the worse-performing country. Even though this is more a dyadic relationship, it does indicate something about the possible (negative) relationship between the stock market and the number of cross-border M&A's. The above finding is in line with the "high buys low" argument by Sudarsanam (2010). In this argument, good performing firms take over bad performing firms to reap a high premium for getting the acquired firms up to the market average. If we extend this line of thinking to countries, the argument would be that a good performing firm in a country with a high level of domestic stock market activity takes over a firm in a country with a low level of domestic stock market activity to utilize this country specific drawback. This could for example be done by benefitting from the acquiring firm's internal capital market (Sudarsanam, 2010). However, a positive relationship between the domestic stock market and the number of cross-border M&A's for the target country is also possible; Neto & Brandao (2009) find evidence for this.

Existing literature on the role of the domestic financial sector on cross-border M&A's only analyze the role of the acquirer's financial sector. Di Giovanni (2003) uses private credit to GDP in the acquirer country and concludes that the domestic financial sector has a positive and significant relationship with the number of cross-border M&A's a country undertakes. This result is also found in Vencatachellum (2013), who proxy the domestic financial sector by M2 to GDP. The theoretical underpinning for this positive relationship is that a larger domestic financial sector can provide the necessary capital for cross-border M&A's; an underdeveloped financial market can constrain the scale of multinational activity.

2.1.2. *Openness determinants*

Openness and restrictions to openness is also been broadly studied in past literature on the determinants of cross-border M&A's. The overall consensus is that more restrictions on trade and financial openness will lead to less cross-border M&A's in both acquirer and target country. The theoretical underpinnings of this relationship can be traced to the paper by Obstfeld (1994) in which the benefits of (financial) openness are presented. Financial openness is supposed to expand investors' opportunities for achieving higher risk adjusted rates of return. For the target country the benefits of more openness are similar, creating welfare gains from international risk sharing (Obstfeld, 1994). While many have since argued that these benefits might actually be costs due to the increased risk financial openness poses, these costs are said to come from short term (portfolio) instead of long-term (FDI, cross-border M&A's) flows.[3]

Di Giovanni (2003) analyzes the role of trade flows from the acquirer to the target country and the effect of these trade flows on FDI in general and cross-border M&A's in specific. He argues that a stylized fact is that FDI and trade are positively correlated in the industrial world, a theory that is acknowledged by his empirical results. He finds a positive and significant relationship for trade between a country pair and the number of cross-border M&A's between the country pair. This result is also found by Monteiro, who uses a more recent dataset (Monteiro, 2012).

Two articles look at the relationship between financial openness and cross-border M&A flows, both based on the Chinn-ito-index. This index features the presence of multiple

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[3] One of the most influential scholars arguing more financial openness is not always beneficial to countries is Dani Rodrik. His book "The Globalization Paradox" gives a substantial overview on the risks of financial openness (Rodrik, 2011).

exchange rates, restrictions on current account transactions, restrictions on capital account transactions, and the requirement of the surrender of export proceeds (Garita & van Marrewijk, 2007). Garita & van Marrewijk (2007) find that if the target country moves up the Chinn-ito-index by one standard deviation, the expected number of M&A deals will increase by as much as 90%. If the acquirer improves by the same deviation, the impact will be an expected increase in cross-border M&A's of 10%. They thus conclude that financial openness stimulates M&A activity. Brakman et.al. (2008) use the same index but their results show a positive significant effect for the acquirer only. So, it appears that restrictions on (financial) openness are negatively correlated with cross-border M&A's for both the acquirer and the target country; the precise magnitude and significant of this relationship is ambiguous based on past literature.

2.1.3. *Institutional quality determinants*

The impact of (the quality of) institutions consists of two hypotheses. The first is the governance hypothesis. Here, a negative relationship is expected between institutional qualities and cross-border M&A's for the target country because companies target firms with poor governance practices. The poor governance practices can be improved by the acquisition, leaving large room for improving and reaping a premium (Manchin, 2004). For the acquirer country, the governance hypothesis thus assumes a positive relationship between the quality of institutions and cross-border M&A's.[4]

The second hypothesis is the outcome hypothesis, where the theory is that M&A activities are more intense between firms with better investor protection. In this hypothesis for both acquirer and target country protection of property rights, integrity of the legal system and other institutional variables are expected to be positively correlated with cross-border M&A's (Manchin, 2004).

Manchin (2004) finds support for both the governance and the outcome hypotheses. The finding that acquirer firms indeed tend to originate from countries with relatively better legal environments and greater availability of finance than target firms supports the

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[4] At first sight, it might appear technically wrong to formulate a governance hypothesis at the macroeconomic level instead of the firm level. However, I agree with Manchin (2004) that corporate governance is influenced by the rights of the shareholders and managers, rights that in turn depend on the legal rules of the jurisdiction in which the firm is situated. In a cross-border M&A it is very likely that the target firm with weaker corporate governance adopts to the rules of the acquirer firm, implying that governance practices can be changed (and in this example strengthened) through cross-border M&A's. So country specific factors regarding institutions impact corporate governance of firms; this might make these firms more likely to be taken over.

governance hypothesis. However, certain institutional factors which cannot be changed through M&A's such as the involvement of the government in the economy are also important. This leads to empirical results showing the preference that acquirers give to these "hard" institutional qualities, which is in support of the outcome hypothesis. Rossi & Volpin (2004) also test the governance hypothesis and find evidence for this by concluding that "acquirers have higher investor protection than targets". They also link the governance hypothesis to the international market for corporate control (which is meant to facilitate takeovers) and the fact that this leads to a convergence in corporate governance across countries (Rossi & Volpin, 2004).

Other studies have looked at certain specific institutions and their effect on cross-border M&A's. Bhagat et.al (2011) turns the governance hypothesis around and argues that acquirers from countries with low institutional quality may voluntarily "bootstrap" themselves onto the higher governance standards of the target, resulting in higher valuation for the acquirer. Neto & Brandao (2009) analyze investor protection and find that the higher investor protection in the target country, the more likely firms use M&A as a mode of entry compared to Greenfield and other forms of FDI. This finding is in line with the outcome hypothesis. Lastly, some studies have looked at the role of corruption on cross-border M&A's. Garita & van Marrewijk (2007) and Brakman et.al (2008) find that a less uncertain business environment will increase M&A activity by 14% by the acquiring country and by 74% for the target economy.

2.1.4. *Macroeconomic determinants*

Several macroeconomic determinants and their effect on cross-border M&A flows have been studied in previous research. First, exchange rate fluctuations can be a determinant for cross-border M&A flows. According to Vencatachullum (2013) the reason exchange rates matter is that cross-border M&A transactions require domestic currencies to be converted to that of the target country and thus affect the value of the acquired assets. Appreciations or depreciations of host and target countries thus have implications for investors. A currency appreciation reduces the costs of foreign acquisitions for domestic firms, stimulating the acquisition of foreign firms and reflecting a positive correlation between exchange rates and cross-border M&A's for the acquirer country (Wang, 2008). For the target country, Erel & Liao (2012) hypothesize a negative relationship between exchange rates and cross-border

M&A's; countries whose currencies have depreciated are more likely to be a target for takeovers; Bhagat et.al. (2011) find the same results.

On top of the exchange rate itself, the (future) volatility of the exchange rate is just as important. Di Giovanni (2003) argues that the relationship between exchange rate volatility and undertaking cross-border M&A's is an empirical question. When facing fixed costs for the cross-border M&A, a firm is likely to postpone the merger (negative relationship between cross-border M&A and exchange rate volatility for both acquirer and target) which might lead to no M&A at all. However, depending on the correlation between the target firm's exchange rate volatility and the overall (acquiring) firm's exchange rate portfolio, high exchange rate volatility may have a negative or positive effect on whether or not to pursue the M&A (Di Giovanni, 2003).

Third, GDP per capita is broadly analyzed as well. For the acquirer countries, existing literature agree on a positive relationship between GDP per capita and cross-border M&A's. Neto & Brandao (2009) explain this positive relationship through the saturation of domestic markets; they argue that high economic growth ends up stimulating firms to invest abroad, to compensate for this saturation. Garita & van Marrewijk (2007) state that richer countries invest more in other countries. For target countries, the relationship could be positive or negative. Veenendaal (2007) and Garita & van Marrewijk (2007) argue that larger and richer countries not only invest more themselves, but are also more attractive to invest in. Erel & Liao (2012) theorize that a negative relationship might also be possible, because of the "high buys low" principle. Because of the lower cost of capital wealthier countries will have a tendency to purchase firms from poorer countries because of a wealth effect (Erel & Liao, 2012). This line of thinking is contrary to the standard gravity model, as flows between two countries are positively related to their economic size.

Lastly, corporate taxes in the target country might play a role in cross-border M&A's. Here, a negative relationship is expected. Low(er) corporate taxes in the target country will make this country attractive to purchase assets in (Di Giovanni, 2003). Table 1 provides an overview of the literature review regarding acquirer –and target country specific determinants of cross-border M&A's.

Table 1: Hypotheses

Dependent variable	Cross-border M&A's	
Determinant	**Hypotheses acquirer**	**Hypotheses target**
Financial		
Domestic stock market activity	Positive	Positive Negative[5]
Role of financial sector	Positive	
Openness		
Restrictions on openness	Negative	Negative
Institutional Quality	Positive	Negative (*governance hypothesis*) Positive (*outcome hypothesis*)
Macroeconomic		
Exchange rates	Positive	Negative
Exchange rate volatility	Positive Negative	Positive Negative
GDP per capita	Positive	Positive Negative
Corporate taxes		Negative

2.2. Factor endowments

In recent years many scholars have researched the effects of FDI on the parent and host countries' (human) capital stock, but few scholars have attempted to look at what precedes this: weren't these differences in the factor endowments of the countries the reason for engaging in the cross-border M&A deal in the first place (Desai, et al., 2005)?

Sun (2012) argues that there are two sources for multinational enterprises to gain ownership advantages. First, there are country specific advantages based on the difference in factor endowments in that country. Second, there are firm-specific advantages based on capability structures. Combining these two we can say that a firm's comparative advantage in an industry arises from the advantage of a complementary combination of country level factor endowments in the industry and the firm-level comparative capability advantage.

The first point made by Sun (2012) is important in explaining the relationship between cross-border M&A's and the factor inputs in the production process. Translating the line of reasoning of the traditional Heckscher-Ohlin model, where trade flow predictions are based on different relative endowments of production factors between countries, to cross-border

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[5] The negative hypothesis for the target country stock market level is the only *relative* relationship (relative to the acquirer country). All other unilateral hypothesis are absolute.

M&A's the following should hold (Blonigen, 2005). For a firm that is in a human-capital intensive industry in a human-capital scarce country it pays off to invest in firms in human-capital intensive countries. The same line of thought holds for physical capital. For a firm that has a production process based on high levels of physical capital but is based in a country with low levels of physical capital, it pays off to invest in firms in physical capital intensive countries. Table 2 shows the 10 most skill-intensive and the 10 most capital-intensive industries (based on US SIC codes). If the hypotheses above hold, then for the 10 most skill-intensive industries we should see a negative relationship between human-capital and cross-border M&A's for the acquirer country and a positive relationship for the target country. For the 10 most capital-intensive industries we expect to see a negative relationship between capital and cross-border M&A's for the acquirer country and a positive relationship for the target country.

Table 2: Factor intensive industries (SIC codes in columns)

10 Most Skill-Intensive Industries		10 Most Capital-Intensive Industries	
3764	Space propulsion units and parts	2111	Cigarettes
3826	Analytical instruments	2087	Flavoring extracts and syrups
3769	Space vehicle equipment	2043	Cereal breakfast foods
3812	Search and navigation equipment	2046	Wet corn milling
3547	Rolling mill machinery	2047	Dog and cat food
2711	Newspapers	2879	Agricultural chemicals
3721	Aircraft	2095	Roasted coffee
3699	Electrical equipment and supplies	2085	Distilled liquor, except brandy
3827	Optical instruments and lenses	2834	Pharmaceutical preparations
3541	Machine tools, metal cutting types	2813	Industrial gases

Source: (Romalis, 2004)

If human capital (: or physical capital) is also seen as a determinant for cross-border M&A's in general (regardless of the input-intensity of the industry) then we would also expect a negative relationship between human capital (: or physical capital) and cross-border M&A's for the acquirer country and a positive relationship between human capital (: or physical capital) for the target country. There has been no research on this relationship prior to this thesis.

2.3. Gravity model determinants

On top of the country specific variables outlined in the sections above, scholars have elaborated on bilateral variables and their relationship with cross-border M&A more extensively. The gravity model's main implication is that the trade between a country-pair depends inversely on the distance between the countries and proportionally on their economic size (Di Giovanni, 2003). The latter relationship was already explained in section 2.1.4. but the former relationship has not yet been explained.

The intuition behind the negative relationship between distance and cross-border M&A's is that a greater distance between two countries makes managing the acquired asset(s) more difficult and thus makes it less desirable to buy or merge with firms in that nation (Garita & van Marrewijk, 2007). Erel & Liao (2012) agree that a higher physical distance should decrease the likelihood that two firms in different countries choose to merge, and add that the same holds for cultural distance. The negative, significant correlation between distance and cross-border M&A's is found in Di Giovanni (2003), Brakman et.al. (2008), Manchin (2004), Neto & Brandao (2009), and Garita & van Marrewijk (2007).

Other bilateral variables that are commonly included in gravity equations are common borders, common language, common currency and trade agreements. Common borders is theoretically a negative relationship because for nearby economies there are other modes of entry available (Brakman, et al., 2008). So, while smaller distances between acquirer and target countries lead to more M&A's and higher values of M&A's, if the countries share a border this relationship vanishes because of the availability of other modes of entry into these markets. Common language supposedly reduces the costs of doing business and will thus be positively related to cross-border M&A's (Garita & van Marrewijk, 2007). A common currency between acquirer and target countries has not been thoroughly researched. Manchin (2004) goes into the effect of the euro on intra-Europe M&A's and finds a positive and significant effect, but adds that this finding might capture the overall increased M&A activities within the EU. The impact of varying trade agreements has been researched by Di Giovanni (2003) and Manchin (2004). The former scholar includes variables for free trade agreements, customs unions and service agreements but only finds statistically (positive) significant results for the service agreements variable. Manchin (2004) includes a dummy for euro-zone country pairs but also finds insignificant results. The effect of different types of trade agreements on cross-border M&A's is thus ambiguous based on existing literature.

[III] Data description

This section outlines the data used for the dependent variable and independent variables. The data on cross-border M&A's consists of 193 countries, which are spread both geographically and in income levels and have all relevant data available[6]. Using these 193 countries, we end up with 552.960 observations.

3.1. Data description: dependent variable

The dependent variable for this research is "the aggregate value of cross-border M&A deals". This variable is used as the primary dependent variable, in line with Di Giovanni (2003) and Ventachellum & Wilson (2013). The reason why this variable should lead to better results than the "number of cross-border M&A deals" used in Manchin (2004) and Brakman et.al. (2008) among others, is that deal value consists of more information due to showing the magnitude of the deals[7].

The data used for the dependent variable is from the Zephyr database and includes completed deals between 1997 and 2011. The Zephyr databased is best described as a database of M&A deals and rumors. In the cross-border deals export information includes: (1) acquirer name, (2) acquirer country code, (3) target name, (4) target country code, (5) deal type, (6) deal status, (7) deal value in Euros, (8) acquirer US SIC code, (9) target US SIC code, (10) acquirer major sector, (11) target major sector, (12) announced date, and (13) completed date. To keep the focus on mergers and acquisitions, institutional buy-outs, capital increases, joint-ventures, management buy-outs and buy-ins, demergers, minority stakes, and share buy backs have been excluded. According to the Zephyr database, mergers are "a one-for-one share swap for shares in the new company and the deal involves a merging of equals" (Zephyr, 2016). Whenever the swap is not on equal terms, the deal is listed as an acquisition in Zephyr. An acquisition is officially stated as "any deal where the acquirer ends up with 50% or more of the equity of the target" (Zephyr, 2016). Furthermore, only completed deals are included in the data and there is a minimum (sum)deal value of €1 million.

One Zephyr specific drawback is that some deals in the sample period have no deal value; these deals are excluded from the dataset[8]. However, similar to Di Giovanni (2003) the

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[6] See Appendix 2 for country list.
[7] Number of cross-border M&A deals will be used as robustness tests for the results.
[8] Lack of deal values for certain M&A's is because firms do not have to announce the deal value.

number of deals with no values appears to be random and thus do not pose a problem for the results of this research.[9]

3.2. Data description: independent variables

The theoretical framework in section two highlights which determinants can explain cross-border M&A behavior. This section outlines which variables are used in this research to capture these effects and which sources have been used to access these data.

Dyadic bilateral variables used in this research include variables on distance, common language, common border, common currency, and trade agreements. All bilateral data are from CEPII - a French research center in international economics (CEPII, 2016). Data from CEPII is available up to 2006, so the data on distance (weighted distance between countries in kilometers), common language, common border and common currencies have been extrapolated to 2011.[10] Regional trade agreements (bilateral) have also been extrapolated; all changes in regional trade agreement post-2006 have been changed in the dataset (see table 2 in Appendix I). Data on GDP per capita, which ranges on the verge of being bilateral or unilateral, is taken from the World Bank and is in current US dollars. The World Bank officially states GDP as "the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products" (The World Bank, 2016).

Unilateral data is taken from a range of sources. Both financial variables – proxies for stock market performance and financial development – are taken from the World Bank (2016). To proxy stock market performance of a country, market capitalization of listed companies (% of GDP) is used. This variable represents the share price times the number of shares outstanding for listed domestic companies (The World Bank, 2016). To measure financial development, we use domestic credit to the private sector (% of GDP) in line with Di Giovanni (2003). This variable refers to financial resources provided to the private sector by financial corporations such as through loans (The World Bank, 2016) and is considered to be the most comprehensive variable for measuring financial development (Cihak, 2013).

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[9] Similar to Di Giovanni (2003), I cannot detect any patterns of the countries, years, or sectors to be missing in the Zephyr database. Hence, the assumption is that these are random. Di Giovanni (2003) found out that "whether a deal is assigned a value or not depends on what appears on the primary source used", so this should not bias the results.

[10] One common currency change has been processed accordingly: ZW (Zimbabwe) adopting the US dollar in 2009 (McGroarty & Mutsaka, 2011).

A sub-index of the KOF Index of Globalization is used to account for the effect of openness. The different sub-indices of the KOF index are built through principle component analysis, which uses all available data of an individual variable and computes the variance of these variables used; the larger the variance, the greater is the weight of that particular variable (Potrafke, 2015). The particular sub-index used in this research is the "restrictions" part of the economic globalization index, an index consisting of (1) hidden import barriers, (2) mean tariff rates, (3) taxes on international trade, and (4) capital account restrictions (Dreher, 2006). To account for different aspects of openness, this index is in my opinion the most complete one available.

Because of the divide in the literature between the governance and the outcome hypothesis, I opt for multiple variables measuring different aspects of institutional quality. First, I include integrity of the legal system, published by the Fraser Institute. This variable has a scale of score from 0 to 10, where 0 is the worst score and 10 is the highest score (Gwartney, et al., 2014). The two other variables measuring institutional quality variables are from the Political Risk Services International Country Risk Guide (PRS). This guide includes a political risk index, which consists of 12 different components that measure different dimensions of business and political environments facing firms operating in a certain country (Political Risk Services, 2014). In this research regulatory quality and control of corruption are included. Regulatory quality reflects the ability of governments to formulate and implement policies and regulations aimed at promoting private sector development (Kaufmann, et al., 2014). Control of corruption reflects the extent to which public power is exercised for private gain (Kaufmann, et al., 2014). One specific drawback of the PRS dataset is that it is available for only 140 countries and that data on 1997 and 1999 are lacking.

Exchange rates data is from Darvas' (2012) REER database. The real effective exchange rate informs on the purchasing power of a currency relative to another currency at present day exchange rates and prices (Darvas, 2012). Exchange rate volatility is calculated in line with Di Giovanni (2003) by first taking the log difference of the end-of-year exchange rates and secondly by measuring the standard deviation for 2 years prior to each period t. Because of the short time span of the data – 1997-2011 – two year volatility has been chosen, in line with Sun et.al (2002).

Data regarding corporate taxes is neither publicly (freely; without charge) available or in possession of Utrecht University, so I opted for using the total tax rate (% of commercial profits) as a proxy for this variable. The total tax rate (% of commercial profits) measures "the amount of taxes and mandatory contributions payable by businesses after accounting for allowable deductions and exemptions as a share of commercial profits" (The World Bank, 2016).[11]

Lastly, the index of human capital per person and the capital stock at current PPP's (in 2005 million US dollars) are taken from the Penn World Tables (Feenstra, et al., 2015). The index of human capital per person is based on years of schooling and returns to education.

### 3.3. Descriptive statistics

The last part of this chapter gives more insight into the data used for this thesis. First, information on the number of cross-border M&A's and corresponding deal values reveals some interesting patterns. The total number of deals done in the sample is 14.245, with a total transaction value of €4.909 billion. Only 5.233 unique observations (years and country pairs) account for these 14.245 observations.[12] The mean cross-border M&A deal value (year/country pair) is €938 million with a substantial standard deviation of €3,7 billion. For the number of deals, there is a mean (year/country pair) of 2,7 with a standard deviation of 5,8. These statistics already show that there is quite a variation between different country pairs and years. For country pairs that have at least one deal in a given year, the minimum number of deals is 1 and the maximum number of deals is 123.

Second, the sum of the number of deals and the sum of the deal values show three wave patterns. Where Di Giovanni (2003) reported about the first wave of cross-border M&A's, peaking in 2000, the data used in this research encompasses two and a half waves: the first wave (2000), the second wave (2008) and the third wave (which seems to be building momentum and has indeed increased in magnitude until 2015). A positive factor of the data used in this research compared to the data used by Di Giovanni (2003) is that Di Giovanni's data included only the run-up to the wave (1990-1999), whereas this research includes data on two whole waves (1997-2003 and 2003-2009).

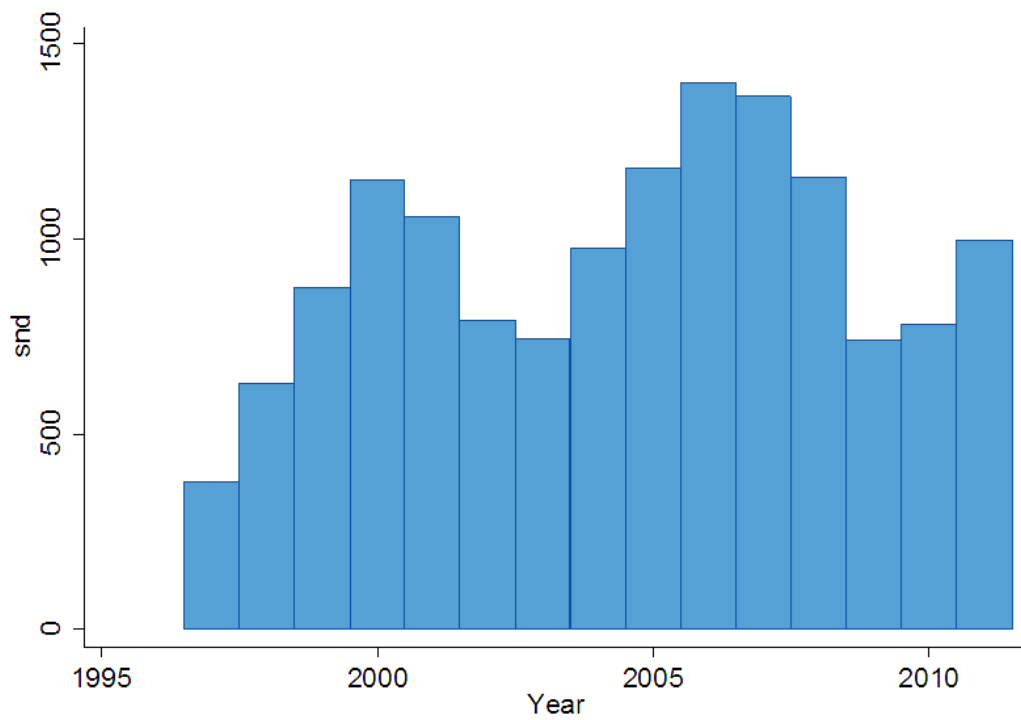[11] Data on the total tax rate is only available post 2006 (The World Bank, 2016).
[12] These statistics are similar to the ones in Di Giovanni (2003) and Brakman et.al (2008) among others.

Figure 1: Sum deal values (sdv: in billions €) – cross-border M&A's (1997-2011)
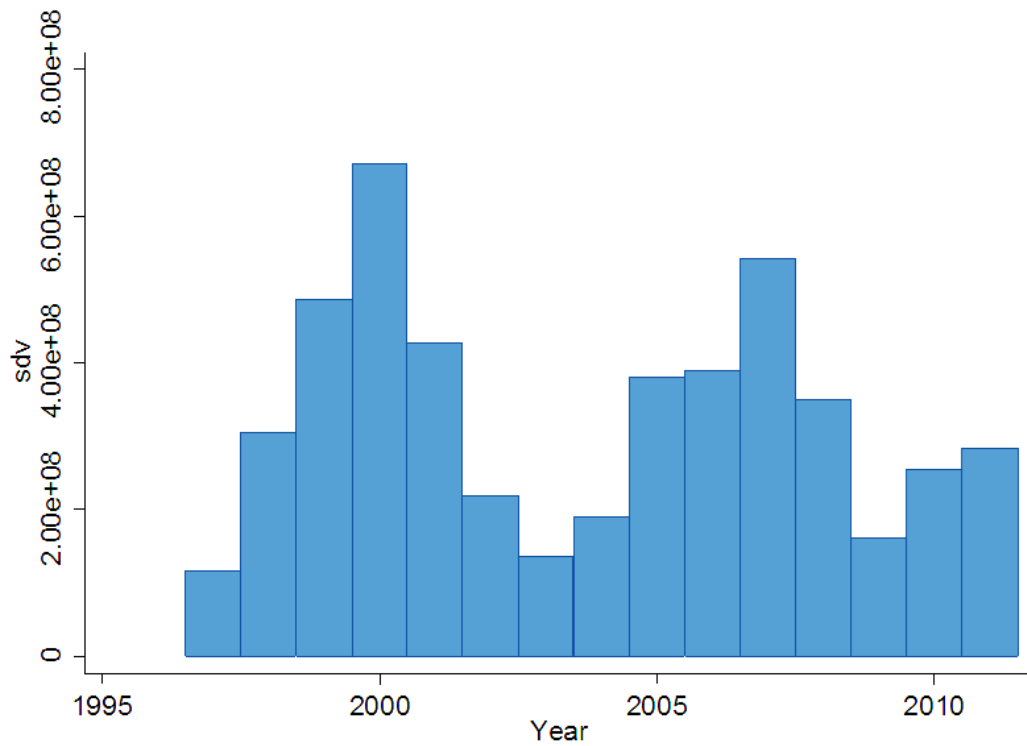
Source: Zephyr, 2016

Figure 2: Sum number of deals (snd) – cross-border M&A's (1997-2011)

Source: Zephyr, 2016

Table 3: Highest scoring year/country pairs

Highest ranking number of deals			Highest ranking deal values (*one million)		
Country pair	Year	Nr. deals	Country pair	Year	Deal value
Great Britain – USA	2000	123	Great Britain – USA	1998	7.500
USA – Great Britain	2000	103	Netherlands – Great Britain	2005	7.260
Great Britain – USA	2001	91	Netherlands – USA	2000	7.260
Great Britain – USA	1999	88	*France – Canada*	2000	6.240
USA – Great Britain	1999	84	France – Great Britain	2000	6.240
Great Britain – USA	2006	76	Germany – USA	2000	6.030
Great Britain – USA	1998	74	Great Britain – USA	1999	5.370
USA – Great Britain	1998	71	Great Britain – USA	2000	5.340
USA – Great Britain	2005	67	Germany – USA	1998	5.260
USA – Great Britain	2004	66	USA – Great Britain	1999	4.890

Third, data on the number of deals compared to the sum of the deal values display relatively similar patterns. The two and a half/three waves are visible in both figures (figure 1 & figure 2). The only striking difference is that the start of the third wave is more apparent in the number of deals than it is in the deal values, which means that the start of the last wave seems to be built on a relatively high number of M&A's encompassing a lower deal value.

Fourth, analyzing the highest scoring year/country pairs reveals some interesting patters in the data. The largest scoring year/country pair is GB/US in 1998 with a total deal value of €7,5 billion. Of the ten highest ranking year/county pairs, either Great-Britain or the United States of America is the acquirer or target in nine of the year/country pairs (table 3). M&A's from GB/US also account for the highest number of deals in a year, which was in 2000 with 123 registered deals over €10 million. When it comes to the number of deals, the ten highest scoring years in number of deals are fully made up by US/GB or GB/US (table 3). The between (across countries) – and the within (time-series variation for a given country) variation acknowledge the above findings partly. For the deal value, the between variation is significantly lower than the within variation, showing that differences for country pairs over time are bigger than the differences between different country pairs overall. For the number of deals there is also a slightly higher variation within the country pairs than between the country

pairs, indicating that differences for country pairs over time are bigger than the differences between different country pairs overall.

Lastly, correlation levels between all of the variables are relatively low. If you would consider correlation levels of 0.75 high, then only one case stands out: the correlation between ILS and Control of Corruption (0.75), which is to be expected since both are institutional quality variables. The correlation is not high enough to pose an econometric issue.

[IV] Methodology

4.1. Model

To find out which variables explain cross-border M&A behavior a gravity model is used. Rooted in trade literature, the gravity model has also proved to be useful in analyzing cross-border FDI and M&A flows. Among others, Di Giovanni (2003), Brakman et.al. (2008) and Manchin (2004) have opted for using the gravity model. The basic model used in this research is:

$$\ln(sumdealvalue)_{ij,t} =$$

$$\propto + \beta_1 \ln\left(MV_{GDP_{per_{capita}}}\right)_{it} + \beta_2 \ln\left(MV_{GDP_{per_{capita}}}\right)_{j,t} + \beta_3 \ln\left(FD_{Market_{cap}}\right)_{i,t}$$

$$+ \beta_4 \ln\left(FD_{Market_{cap}}\right)_{j,t} + \beta_5 \ln\left(FD_{Private_{credit}}\right)_{i,t} + \beta_6 \ln\left(FD_{Private_{credit}}\right)_{j,t}$$

$$+ \beta_7 OP_{Openness_{i,t}} + \beta_8 OP_{Openness_{j,t}} + \beta_9 IQ_{ILS_{i,t}} + \beta_{10} IQ_{ILS_{j,t}}$$

$$+ \beta_{11} IQ_{Regulatory_{quality_{i,t}}} + \beta_{12} IQ_{Regulatory_{quality_{j,t}}} + \beta_{13} IQ_{Control_{corruption_{i,t}}}$$

$$+ \beta_{14} IQ_{Control_{corruption_{j,t}}} + \beta_{15} MV_{REER_{i,t}} + \beta_{16} MV_{REER_{j,t}} + \beta_{17} MV_{REERVolatility_{i,t}}$$

$$+ \beta_{18} MV_{REERVolatility_{j,t}} + \beta_{19} MV_{Total_{tax_{j,t}}} + \beta_{20} FP_{Human_{capital_{i,t}}}$$

$$+ \beta_{21} FP_{Human_{capital_{j,t}}} + \beta_{22} Ln\left(FP_{Physical_{capital}}\right)_{i,t} + \beta_{23} Ln\left(FP_{Physical_{capital}}\right)_{j,t}$$

$$+ \beta_{24} Ln(distw)_{ij,t} + \beta_{25} contig_{ij,t} + \beta_{26} comcur_{ij,t} + \beta_{27} comlang_{off_{ij,t}}$$

$$+ \beta_{28} rta_{ijt} + u_t + u_i + u_j + \varepsilon_{it}$$

where *i* and *j* denote the acquirer and target countries respectively and *t* denotes time (1997-2011). The dependent variable is defined as:

- Ln(sumdealvalue)$_{ij,t}$: log of the sum of cross-border M&A deal values (thousands Euros) from country *i* to country *j* at year *t*.

The independent variables are defined as:

- Ln(MV_GDP_per_capita) $_{i,t}$: log of GDP per capita (2005 USD) in acquirer country *i*.
- Ln(MV_GDP_per_capita) $_{j,t}$: log of GDP per capita (2005 USD) in target country *j*.
- Ln(FD_Market_cap) $_{i,t}$: log of stock market capitalization (% GDP) in acquirer country *i*.
- Ln(FD_Market_cap)$_{j,t}$: log of stock market capitalization (% GDP) in target country *j*.
- Ln(FD_Private_credit) $_{i,t}$: log of domestic credit to private sector (% GDP) in acquirer country *i*.

- Ln(FD_Private_credit) $_{j,t}$: log of domestic credit to private sector (% GDP) in target country j.
- OP_Openness $_{i,t}$: restriction on openness index in acquirer country i.
- OP_Openness $_{j,t}$: restriction on openness index in target country j.
- IQ_ILS $_{i,t}$: index of the integrity of the legal system in acquirer country i.
- IQ_ILS $_{j,t}$: index of the integrity of the legal system in target country j.
- IQ_Regulatory_quality $_{i,t}$: index of the regulatory quality in acquirer country i.
- IQ_Regulatory_quality $_{j,t}$: index of the regulatory quality in target country j.
- IQ_Control_corruption $_{i,t}$: index of the control of corruption in acquirer country i.
- IQ_Control_corruption $_{j,t}$: index of the control of corruption in target country j.
- MV_REER $_{i,t}$: real effective exchange rate in acquirer country i.
- MV_REER $_{j,t}$: real effective exchange rate in target country j.
- MV_REERvolatility $_{i,t}$: real effective exchange rate volatility in acquirer country i.
- MV_REERvolatility $_{j,t}$: real effective exchange rate volatility in target country j.
- MV_Total_tax $_{j,t}$: total tax rate (% of commercial profits) in target country j.
- FP_Human_Capital $_{i,t}$: index of human capital per person in acquirer country i.
- FP_Human_Capital $_{j,t}$: index of human capital per person in target country j.
- Ln(FP_Physical_Capital) $_{i,t}$: log of the index of capital stock at current PPP's (2005 million USD) in acquirer country i.
- Ln(FP_Physical_Capital) $_{j,t}$: log of the index of capital stock at current PPP's (2005 million USD) in target country j.
- Ln(distw) $_{ij,t}$: log of the weighted distance between i and j (km).
- contig $_{ij,t}$: binary variable equal to 1 if i and j have a common border.
- comcur $_{ij,t}$: binary variable equal to 1 if i and j have a common currency.
- comlang_off $_{ij,t}$: binary variable equal to 1 if i and j have a common official language.
- contig $_{ij,t}$: binary variable equal to 1 if i and j have a common border.
- rta $_{ij,t}$: binary variable equal to 1 if i and j have a regional trade agreement.

The model is completed by the constant $\propto$, year-dummies for time fixed-effects u_t, acquirer-dummies for acquirer fixed-effects u_i, target-dummies for target fixed effects u_j, and the error term ε_{it}. One other variable used in this research (as robustness checks) is *ln(nrdeals)* representing the log of the number of cross-border M&A deals from country i to country j at year t.

4.2. Estimation method

Previous literature highlights that estimation of the gravity model is not straightforward, because of the "zero gravity problem". This problem arises because the percentage of observations being "zero" is quite high in trade-data and even higher in cross-border M&A data (see next section). The high percentage of zero observations leaves the log-linearized gravity specification undefined for observations with zero flows. This gives rise to

concerns about sample selection bias, because the sample from which the regression is estimated is drawn only from the M&A flows which are positive instead of randomly from the population (Shepherd, 2013).

A method commonly used is to discard the zeros and use OLS, or by using a Tobit estimation to estimate the gravity model (Brakman, et al., 2008). However, these measures are no longer accepted as the zeroes in the population model are not randomly distributed and would thus create selection bias.

Therefore, alternative estimation methods for estimating gravity models have been developed. The two most important methods are (1) the Poisson Pseudo-Maximum Likelihood Estimator and (2) The Heckman Sample Selection Estimator. Both deal with the "zero gravity problem", albeit in a different way, and are mostly preferred over OLS.[13] However, as the number of zero observations in cross-border M&A's is even higher than with data on trade, I want an estimation method which also gives information on *the probability of* positive M&A flows and a set of explanatory variables instead of a method which just gives information on the relationship between M&A flows and a set of explanatory variables. The Heckman estimator does just this and will therefore be used in this research.

The Heckman estimator is a two-step procedure. First, a probit estimator is used to estimate the probability that a particular observation is included in the gravity model. Second, these probit estimates are used to create the inverse Mill's ratio, a ratio corresponding with the probability of selection variable(s) omitted from the original equation. Inclusion of this additional variable solves the omitted variable bias problem and estimates results consistent in the presence of non-random sample selection (Shepherd, 2013).

Finding an appropriate exclusion restriction for identification of the second stage equation is the difficult part of the Heckman estimator. It has to be a variable that affects the probability that two countries engage cross-border M&A's, but not the volume of cross-border M&A's once it takes place. There must be at least one additional variable for the selection equation. In this research I use (1) rural population (% of total population) as primary exclusion restriction variable and (2) the cost to import: border compliance and (3) political globalization (KOF index) as robustness checks. The first comes from the World Bank (2016) and is measured for both acquirer and target country (combined). The reasoning

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[13] That the zero gravity problem is indeed a problem in this research, is apparent from the rho in section five (a rho close to one suggests that sample selection is a serious problem in the dataset).

is that firms (doing large M&A's) are usually situated in dense areas; the opposite of what rural areas are known for. Therefore, having a higher level of rural population will make it less attractive to engage in a cross-border M&A with this country, but will subsequently not affect the number of cross-border M&A's one undertakes with this country. The second selection variable is the border compliance, which represents the time and cost for obtaining, preparing and submitting documents during port or border handling, customs clearance and inspection procedures (World Bank Group, 2015). This data comes from the World Bank's doing business website and is used only for the target country. The line of reasoning behind this selection variable is that a country is less probable to become a target in a cross-border M&A deal if it is known to be very slow in completing legal issues. So this variable is more of a proxy for the time it would take to complete the merger and to get the merged entity up and running post-merger. The third selection variable, the political globalization sub index of the KOF-index, is a proxy for political globalization based on the number of embassies in a country, membership in international organizations, participation in UN Security Council missions, and international treaties (Dreher, 2006). Because all four parts of the political globalization index influence the connections between countries, I include this variable as robustness selection variable because it might influence the probability that countries engage in M&A's but not necessarily the number of M&A's these countries undertake.

Furthermore, due to an indication of heteroscedasticity in the data all equations have been run with the robust option.[14] The cluster option has also been added, to allow for the correlation of the error terms within groups defined by variable distance - *distw* (Shepherd, 2013).

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[14] Robust & cluster options have been added when possible. The Heckman selection estimator is known to not always reach equilibrium (not concave error). When equilibrium is not reached, the twostep command in Stata is used instead. This option does not allow for either robust or cluster function. Twostep is only used in certain robustness tests, all (unilateral) baseline regressions are run with both robust and cluster options.

[V] Results

Section five shows the results of this research. First, findings from different baseline regression specifications are presented. Second, the hypotheses on the relationship between different factors of production and cross-border M&A's (as outlined in section 2.2) are tested. Last, multiple robustness tests are performed to see whether the results presented are robust to changes in specifications.

5.1. Baseline results

This section shows the basic results of this research using multiple baseline specifications. We start by showing the baseline results with different forms of fixed effects. Second, the baseline results with all variables from section 2.1 are included. The only thing in which these baseline results differ is the inclusion of certain variables, which have been excluded from the first baseline regression because including these variables significantly reduces the dataset (total tax rate & market capitalization). Therefore, baseline model four tells us most about the included variables and the other baseline models (five and six) are mainly important for the variables with less data-availability.

Table 4 reports the baseline results with time dummies (1), time invariant acquirer and target fixed effects (2), and for time varying acquirer and target fixed effects (3). All three specifications have 5.049 observations for the regression and 458.213 observations for the selection. The rho of 0.75, 0.98, and 0.99 already give an indication that sample selection bias is indeed a problem for the data, so the implementation of the Heckman estimator is correct (rho close to 1 means that sample selection is a problem in the dataset).

GDP per capita is positive and highly significant in all three estimations, for both acquirer and target. In model three (time, acquirer and target FE) GDP per capita of the target country has a positive and significant impact with an elasticity of 1,92. This means that when GDP per capita of the target country increases by 10,0%, cross-border M&A deal values in which this country is the target increase with 19,2% (all else equal). The selection part of regression (3) shows that GDP per capita of the target country not only matters for the volume of M&A's, but also for the probability that two countries engage in cross-border M&A's: a 10,0% increase of the target countries' GDP per capita increases the probability that there is a cross-border M&A with this country as target country with 3,8% (all else equal).

Table 4: Baseline fixed effects results

Dependent variable	Cross-border M&A (log) sumdealvalue					
Estimation Method	Heckman		Heckman		Heckman	
Specification	Regression	Selection	Regression	Selection	Regression	Selection
	(1)		(2)		(3)	
lMV_GDP_per_capita						
acquirer	0.813***	0.386***	3.400***	1.264***	3.041***	0.975***
target	0.611***	0.206***	1.757***	0.544***	1.920***	0.376***
l(distw)	-0.0545	-0.079***	-0.827***	-0.320***	-0.898***	-0.329***
contig	1.374***	0.652***	0.909***	0.337***	0.853***	0.314***
comcur	0.521***	0.161***	-0.490***	-0.193**	-0.611***	-0.229***
comlang_off	0.618***	0.291***	1.312***	0.489***	1.394***	0.493***
rta	0.488**	0.385***	0.492***	0.195***	0.514***	0.189***
Rural_population_both		-0.0000596***		0.000184***		0.000185**
Observations	5.049	458.213	5.049	458.213	5.049	458.213
Time FE	Yes		No		Yes	
Acquirer FE	No		Yes		Yes	
Target FE	No		Yes		Yes	
rho	0.75		0.98		0.99	

***Significant at the 1 percent level
**Significant at the 5 percent level
*Significant at the 10 percent level

Like GDP per capita, variables on distance (*ldistw*), common official language (*comlang_off*), and regional trade agreements (*rta*) all have the expected signs based on section 2.3. Contrary to theoretical findings is the positive relationship between cross-border M&A's and having a common currency (*comcur*) and the positive relationship between cross-border M&A's and having a common border (*contig*). One of the reasons for a negative relationship between having a common currency and cross-border M&A's could be that the dominance in the cross-border M&A data by Great-Britain and the USA, which have different currencies, alters the positive relationship into a negative relationship. This will be discussed in section 5.3. As for the positive sign of having a common border; even though there are technically other modes of entry available when there is a common border, being closer to the country in which the other firm is situated should still be seen as a positive factor in explaining cross-border M&A's. The positive sign may thus mean that (1) the hypothesized negative effect is only relative to other modes of entry and not absolute or (2) that cross-border M&A's are now more important compared to other modes of entry. However, the positive relationship between cross-border M&A's and contiguity is *not* in line with Brakman et.al (2008).

Table 5: Baseline regression results

Dependent variable	Cross-border M&A (log) sumdealvalue					
Estimation Method	Heckman		Heckman		Heckman	
Specification	Regression	Selection	Regression	Selection	Regression	Selection
	(4)		(5)		(6)	
lMV_GDP_per_capita						
acquirer	0.549***	0.140***	0.484***	0.120***	0.413***	0.0985***
target	0.110	-0.0356	0.159*	-0.0300	0.0838	-0.0041
lFD_Market_cap						
acquirer			0.517***	0.193***		
target			0.299***	0.0885***		
lFD_Private_credit						
acquirer	0.489***	0.172***	0.238	0.0847**	0.494***	0.163***
target	-0.0682	-0.00671	-0.133	-0.0349	0.197*	0.0687**
OP_Openness						
acquirer	-0.00486	0.000181	-0.00271	0.00230	-0.0164*	-0.00222
target	0.00901*	0.00419***	0.00784	0.00396**	0.0130*	0.00553***
IQ_ILS						
acquirer	-0.0560	0.00332	-0.0687	0.000974	-0.0509	-0.00625
target	-0.0932**	-0.0307***	-0.102**	-0.0383***	-0.0742	-0.0530***
IQ_Regulatory_quality						
acquirer	2.758***	0.840***	1.515***	0.672***	4.170***	1.183***
target	0.364	0.317***	-0.424	0.101	0.473	0.325**
IQ_Control_corruption						
acquirer	1.781***	0.564***	1.796***	0.521***	1.267**	0.400***
target	1.994***	0.539***	1.961***	0.612***	2.008***	0.559***
MV_REER						
acquirer	-0.0055	-0.0034***	-0.00473	-0.00318**	-0.0148**	-0.00464**
target	-0.0162***	-0.054***	-0.0162***	-0.00593***	-0.0233***	-0.00573***
MV_REERvolatility						
acquirer	-1.403*	-0.114	-0.833	0.116	-4.0773**	-0.532
target	0.346	0.183	0.344	0.274	3.696**	0.774*
MV_Total_Tax						
target					0.0084**	0.00261**
FP_Human_capital						
acquirer	-0.521***	-0.182***	-0.469**	-0.177***	-0.400*	-0.141**
target	0.291*	0.150***	0.181	0.154***	-0.0225	0.0869
lFP_Physical_capital						
acquirer	0.936***	0.307***	0.859***	0.300***	1.014***	0.307***
target	0.855***	0.276***	0.767***	0.261***	0.718***	0.223***
l(distw)	-0.844***	-0.284***	-0.794***	-0.290***	-0.949***	-0.293***
contig	1.080***	0.330***	1.125***	0.351***	1.604***	0.396***
comcur	-0.764***	-0.260***	-0.690***	-0.260***	-0.624***	-0.239***
comlang_off	1.919***	0.656***	1.503***	0.584***	1.964***	0.628***
rta	0.224*	0.0922**	0.333**	0.125***	0.262*	0.0831*
Rural_population_both		-0.0000508***		-0.0000407*		-0.0000457*
Observations	3.216	100.109	2.516	44.340	1.734	58.985
rho	0.96		0.94		0.98	

***Significant at the 1 percent level | **Significant at the 5 percent level | *Significant at the 10 percent level

The expected signs and significance for bilateral gravity-type variables distance (*ldistw* − negative), common official language (*comlang_off* − positive), and regional trade agreements (*rta* − positive) are also found in baseline regressions four, five and six (table 5).[15] Just as in table 4 the value of rho comes close to one in all three specifications, which means that the Heckman estimator is a good technique for analyzing the data.

5.1.1. *Financial determinants*

Baseline regression 4 shows a significant positive relationship between private credit and cross-border M&A's of the acquirer country for both the regression and the selection. This relationship is also expected based on theoretical findings, as a larger domestic financial sector can provide the necessary capital for cross-border M&A's. For the Netherlands (e.g.) with a mean sample value of 112,74 for the private credit to GDP a rise of private credit to GDP by 11,274 (10% of 112,74) leads to a rise in the cross-border M&A's deal value of 68.851 thousand euros (4,89% of 1.407.997) and to a higher probability of undertaking M&A's as the acquirer country by 1,72%. For the target country the relationship between private credit and cross-border M&A's is insignificant, an outcome which is in line with existing literature.

Market capitalization as a proxy for stock market performance is included in baseline regression 5. It is positively significant for both acquirer and target country and for the regression as well as the selection models. These findings are largely in line with previous literature, although the positive relationship between the market capitalization and cross-border M&A's for the target country was only found in Neto & Brandao (2009). The dyadic relationship outlined by Manchin (2004) and Erel & Liao (2012) in which is stated that the greater the difference in stock market performance between the two countries, the more likely firms in the superior performing country acquire firms in the worse-performing country cannot be found directly from regression 5. However, the coefficients of 0.517 for the acquirer country and 0.299 for the target country do indicate that the effect of stock market performance on cross-border M&A's is larger for acquirer countries, than it is for target countries. Taking the Netherlands (with a mean market capitalization to GDP of 100) as example again, a rise of market capitalization up to the market capitalization level of Australia (increase of 10) leads to a rise in cross-border M&A deal value of 72.793 thousand euros (as

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[15] Section 5.3 will go further into the unexpected negative sign of having a common currency (*comcur*), for an explanation of the positive sign of having a common border (*contig*) see page 28.

acquirer country). Furthermore, even though regression 5 has a lower number of observations and thus lower statistical significance than regression 4, the decline in statistical significance of private credit might still be an indication that stock market capitalization is a relatively better/more important determinant in explaining cross-border M&A's than private credit is.

Testing the joint significance of the financial variables through F-tests on market capitalization and private credit for the acquirer countries, the target countries, and both selection and regression models, in all tests the null hypothesis is rejected: the included variables capturing financial development of a country *are* a significant determinant in explaining cross-border M&A flows and the probability of cross-border M&A´s for a certain country-pair.

5.1.2. *Openness determinants*

Findings from baseline regression 4 indicate that openness is a positive (significant) determinant for explaining both the cross-border M&A deal value and the probability of M&A's for the target country, but is not a significant determinant for the acquirer country. These findings are in line with Garita & van Marrewijk (2007), but contrary to Brakman et.al (2008) who only find a positive significant effect to the acquirer country.

Taking Mexico as an example, if the Mexican openness would reach the same level of openness as Switzerland (which equals an increase of 10, from 59 to 69), this would lead to an increase in the number of cross-border M&A's as a recipient country of 0,0901% (which is equal to 938.803*0.0901=84.586 thousand euros). The increase of openness by ten points on the openness-index would also imply an increase in the probability that Mexico undertakes M&A's as the recipient country of 0,0419% (all else equal).

5.1.3. *Institutional quality determinants*

To test which of the two hypotheses – governance and outcome – are supported by the data, variables on integrity of the legal system, regulatory quality and control of corruption are included in the baseline regressions. I consider control of corruption the strongest variable in explaining the governance hypothesis as this is something that can be changed after the acquisition. If a firm takes over a firm in a different country because it is poorly managed and corrupt, then improving this specific drawback makes for an easy premium; that is what the governance hypothesis is about. However, results show that only integrity of the legal system is negatively significant for the target country. Both other variables – regulatory quality and

control of corruption – show a strong positive correlation with cross-border M&A's for the acquiring and target country, pointing towards the outcome hypothesis of M&A's flows between firms in countries with better investor protection.

One other interesting hypothesis is the "bootstrap" hypothesis, where acquirers from countries with low institutional quality "bootstrap" themselves onto the higher governance standards of the target. This translates into negative institutional quality coefficients for the acquirer country and positive institutional quality coefficients for the target county; these findings are *not* in line with the results in the baseline regressions.

Testing the joint significance of the institutional quality variables through different F-tests, the null hypothesis of no relationship is rejected in all tests: the included variables capturing the institutional quality of a country combined *are* a significant determinant in explaining cross-border M&A flows and the probability of cross-border M&A´s for a certain country-pair.

5.1.4. *Macroeconomic determinants*

Contrary to the fixed effects results of GDP per capita (positively significant for both acquirer and target), the baseline results from 4, 5, and 6 are only (positively) significant for the acquirer country. This is contrary to existing literature and is therefore a surprising finding: in explaining the deal values and probability of a country being the recipient of cross-border M&A's, other variables seem to be more important than GDP per capita.

For the exchange rate, the expected negative (significant) relationship between the exchange rate of the target country and cross-border M&A's is found in baseline regression 4. For the acquirer country, a positive relationship is expected: having a real currency appreciation makes the cost of acquiring foreign assets cheaper and should thus lead to more cross-border M&A's as acquirer country. However, the effect is insignificant for the *aggregate deal values* of cross-border M&A's and negative for the *probability* of engaging in M&A's. Robustness checks in 5.3 will go deeper into this relationship.

As hypothesized in section 2.1.4 on top of the exchange rate itself, the volatility of the exchange rate is important as well. Theoretically, there are multiple relationships possible. The data displays one significant relationship: a negative relationship between the exchange rate volatility and cross-border M&A's for the acquirer country. This means that having lower exchange rate volatility increases the deal value of cross-border M&A's undertaken by a

certain country, which indirectly also confirms the hypothesis that firms in countries facing high exchange rate volatility may postpone their cross-border M&A activities.

Lastly, the total tax rate of the target country is included in baseline regression 6. A negative relationship is expected, but a significant positive relationship is found. This is probably due to data limitations (see section 3.2): the total tax rate might capture the effect of the tax structure of the country instead of just the corporate taxes firms within these countries pay; section 5.3 will go deeper into this result. Similar to the financial and institutional quality variables, all F-tests on the statistical significance of the macroeconomic variables on cross-border M&A's are significant.

5.2. Factors of production analysis

Regression 4 (table 5) also includes both human- and physical capital variables. As stated in section 2.2, for the whole sample the expectation is that if human (or physical) capital is a determinant for engaging in cross-border M&A's, it is so because that particular production factor is lacking in the acquirer country and abundant in the target country. This indicates a negative relationship between human (or physical) capital for the acquirer country and a positive relationship between human (or physical) capital for the target country. This result is indeed found in baseline regression 4 (table 5) for human capital. Having a higher level of human capital decreases the deal values and probability of M&A's done as an acquirer country, but increases the deal values and probability of M&A's as a target country. This relationship is not found for physical capital: having a higher level of physical capital does increase the deal values and probability of M&A's as target country, but also increases the deal values and probability of M&A's undertaken as an acquirer country.

This relationship should be even more apparent for the 10 most physical capital intensive industries (lFP_Physical_capital) and for the 10 most human capital-intensive industries (for FP_Human_capital) as outlined in table 2 (p.15). For the 10 most capital intensive industries there is indeed only a positive significant effect for the target country, in line with expectations. However, when we also include industries from the same category (e.g. all tobacco products where only cigarettes is stated among the 10 most capital intensive industries, or all grain mill products where only cereal, wet corn, and dog and cat food are among the 10 most capital intensive industries) physical capital and the number of cross-

Table 6: Production factors results[16]

Dependent variable	Cross-border M&A (log) sumdealvalue				
Estimation Method	**OLS**	**OLS**	**OLS**	**OLS**	**OLS**
Specification	Capital intensive industries (NAICS)	Capital intensive industries (SIC)	Human capital intensive industries (NAICS)	Human capital intensive industries (SIC)	Capital intensive industries (SIC)
	(7)	(8)	(9)	(10)	(11)
FP_Human_capital					
acquirer	-0.696	-0.308	-0.989	-2.002	-0.131
target	-0.314	0.0354	1.085	-0.245	-0.109
lFP_Physical_capital					
acquirer	0.186	0.164**	0.129	0.106	
target	0.212**	0.175***	0.795***	0.655***	
lFP_Physical_population					
acquirer					1.68(e-10)
target					3.85(e-09)***
X	Yes	Yes	Yes	Yes	Yes
Observations	131	257	30	50	257
R^2	0.32	0.20	0.87	0.64	0.19

***Significant at the 1 percent level | **Significant at the 5 percent level | *Significant at the 10 percent level

-border M&A's is positively significantly correlated both for the acquirer and target country.[17] This result is in line with the baseline findings in table 5. In regression 11 we checked whether the findings from regression 8 hold when physical capital is divided by population.[18] The positive significant result for the target country is found again but the significant effect of the acquirer country disappears, which might indicate that this significant effect is just because larger countries have higher levels of physical capital.

For the human capital intensive industries (regression 9 and regression 10), both regressions do not yield any results. This is not surprising, given that even when including more industry codes in regression 10 the number of observations remains low at 50. What the lack of observations for human capital intensive industries does show is that there are apparently significantly more cross-border M&A's done in physical capital intensive industries than in human capital intensive industries.

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[16] The X-variable consists of all variables also included in baseline regression 4.
[17] See regression 8 in table 6.
[18] (FP_Physical_capital/Population)*100

5.3. Robustness tests

Turning to the robustness test in which the (logarithm of the) sum of the deal values is replaced by the (logarithm of the) number of deals in table 7 (regression 12), one sees that the signs and significance of all variables are relatively similar to the ones presented in table 5 (regression 4). The only significant difference is that the significant negative exchange rate volatility coefficient in regression 4 is no longer significant in regression 12. This is expected if we consider the number of deals variable to possess less information than the deal values variable.

In regression 13 the exclusion restriction variable used in all different specifications (rural population of acquirer and target country) is replaced by the target's documentary compliance and the political KOF index of both acquirer and target countries. This replacement also changes little in the respective signs and significance as presented in table 5. The only notable differences are that the exchange rate volatility becomes insignificant (with a similar coefficient magnitude) and that the regional trade agreements variable becomes just insignificant.

Third, because of the dominance of Great-Britain and USA in the cross-border M&A data (as shown in section 3.3) these two countries are dropped from the sample to see whether certain findings are not just driven by these two countries (regression 14, table 7). The difference is mainly apparent in the regression section capturing the effect of the variables on the aggregate cross-border M&A deal values. This finding is not surprising, given the fact that the largest cross-border M&A deals are very much focused in Great-Britain and the USA. As hypothesized earlier, the highly significant negative relationship between having a common currency and the *value* of cross-border M&A's is mainly driven by Great-Britain and the USA. With these two countries dropped from the sample, having a common currency is now positively correlated with cross-border M&A deal values. Another interesting change compared to baseline regression 4 is the highly significant negative relationship between the exchange rate volatility and the *value* of cross-border M&A's for both acquirer and target countries. For a sample of countries excluding Great-Britain and the USA, having lower exchange rate volatility thus seems to be an important determinant in explaining cross-border M&A flows. When it comes to the *probability* of engaging in cross-border M&A's (the selection regression) all results stay relatively similar to baseline regression 4.

Table 7: Robustness regression results

Dependent variable	(log) nr. Deals		(log) sumdealvalue		(log) sumdealvalue	
Estimation Method	Heckman		Heckman		Heckman	
Specification	Regression	Selection	Regression	Selection	Regression	Selection
	(12)		(13)		(14)	
lMV_GDP_per_capita						
acquirer	0.299***	0.122***	0.561***	0.159***	0.214**	0.0884***
target	-0.0400	-0.0527***	0.113	-0.0212	0.0593	-0.0942***
lFD_Private_credit						
acquirer	0.444***	0.183***	0.506***	0.164***	0.129	0.155***
target	-0.0378	-0.00637	-0.0834	-0.0121	-0.0730	-0.018
OP_Openness						
acquirer	0.00473	0.000197	-0.00534	0.000221	-0.00881**	-0.00248**
target	0.0111***	0.00432***	0.00906*	0.00329**	-0.00372	0.00209*
IQ_ILS						
acquirer	0.000934	0.00220	-0.0614	-0.00384	-0.0558*	-0.004
target	-0.0706***	-0.0286***	-0.0899**	-0.0300***	-0.0225	-0.0310***
IQ_Regulatory_quality						
acquirer	2.022***	0.882***	2.867***	0.823***	1.017*	0.963***
target	0.551*	0.323***	0.386	0.288***	-0.0761	0.392***
IQ_Control_corruption						
acquirer	1.338***	0.561***	1.862***	0.556***	0.886**	0.595***
target	1.240***	0.510***	2.0224***	0.533***	1.219***	0.516***
MV_REER						
acquirer	-0.00762**	-0.0034***	-0.00549	-0.00322***	-0.000369	-0.00241**
target	-0.0120***	-00562***	-0.0170***	-0.00511***	-0.00463	-0.00570***
MV_REERvolatility						
acquirer	-0.155	-0.0896	-1.337	-0.0885	-2.765**	-0.200
target	0.137	0.207	0.430	0.197	-0.0402**	0.0747
FP_Human_capital						
acquirer	-0.310**	-0.181***	-0.536***	-0.180***	-0.163*	-0.120***
target	0.367***	0.146***	0.277	0.149***	0.116	0.220***
lFP_Physical_capital						
acquirer	0.769***	0.305***	0.953***	0.303***	0.323***	0.270***
target	0.733***	0.274***	0.869***	0.272***	0.239**	0.241***
l(distw)	-0.671***	-0.293***	-0.867***	-0.275***	-0.267**	-0.289***
contig	0.829***	0.365***	1.0945***	0.338***	0.504***	0.365***
comcur	-0.736***	-0.258***	-0.782***	-0.264***	0.282**	-0.096**
comlang_off	1.723***	0.651***	1.965***	0.673***	0.513**	0.599***
rta	0.256***	0.099***	0.208	0.0779***	0.192*	0.157***
Rural_population_both		-0.0000948***				-0.000105***
Documentary_target				-0.000224***		
KOF_political_both				0.000122		
Observations	3.216	100.109	3.216	100.109	2.211	96.898
rho	1.00		0.97		0.44	

***Significant at the 1 percent level | **Significant at the 5 percent level | *Significant at the 10 percent level

Last, baseline model 6 and baseline model 8 (table 5) have been estimated with the inclusion of time varying acquirer and target fixed effects (table 12 – appendix I). Hornok (2011) researched what it means to include fixed effects when aiming to capture the influence of unilateral variables and concludes that the estimated coefficients of these unilateral variables may not be meaningful estimates. With the country fixed effects, only the variation within countries will be used for the unilateral variables. Because this variation is rather small for most of the included variables, almost all impact of these variables is removed from the results. For this reason the estimates on the baseline model including all unilateral variables and fixed effects are not preferred, but can still provide useful evidence into the unexpected sign of the total tax rate. Econometrically the effect captured in baseline regression 6 (positive sign for total tax rate), might be due to a correlation between the total tax rate and other unobserved country-specific variables[19]. Including these unobserved variables through fixed effects may give the negative relationship hypothesized in section 2.1.4.

The expected decline in significance of nearly all unilateral variables is indeed evident from regressions 15 and 16 (table 12 – appendix I)[20]. Significant results are yielded only by GDP per capita (acquirer and target), openness (target, different sign than before), regulatory quality (acquirer and target, target different sign than before), and control of corruption (acquirer). All other unilateral variables become insignificant, which is not surprising given the explanation above. The total tax sign does become negative in regression 16, but is not statistically significant. The other interesting result in table 12 is the significant *negative* effect of regulatory quality for the target country, which is more in line with the governance hypothesis than with the outcome hypothesis. However, as stated before baseline results *excluding* fixed effects do a better job econometrically and give the unilateral variables more explanatory power. These are therefore preferred over the results in table 12.

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[19] See p.34 for more information on the unexpected (positive) finding between cross-border M&A's and the total tax rate.

[20] Coefficients and signs on the bilateral variables are (relatively) similar to the baseline models *without* fixed effects (baseline regression 6 and baseline regression 8).

[VI] Conclusion

This thesis aimed at answering which unilateral and bilateral variables are determinants in explaining cross-border M&A deal values and the probability that two countries engage in cross-border M&A's. The findings on the unilateral – acquirer and target specific – variables are summarized in table 6. First, for both financial variables the acquirer country hypotheses are confirmed by the results. For the target country the relationship was hypothesized to be either positive or negative, but only the positive relationship is confirmed. Second, openness seems to be an important determinant for the target country only, which is in line with findings by Garita & van Marrewijk (2007) and contrary to findings by Brakman et.al. (2008). Third, results on the institutional quality are more in support of the outcome hypothesis than the governance hypotheses, indicating that firms from countries with higher governance are more attractive for takeovers than firms from countries with lower governance. Last, for macroeconomic variables exchange rates are found to have a negative impact of cross-border M&A's for the target country, exchange rate volatility to have a negative impact on the acquirer country, and GDP per capita to have a positive impact on cross-border M&A's for the acquirer country. Results on corporate taxes are not conclusive.

Table 8: Hypotheses results (green are confirmed by the results)

Dependent variable	Cross-border M&A's	
Determinant	**Confirmed hypotheses acquirer**	**Confirmed hypotheses target**
Financial		
Domestic stock market activity	Positive	Positive Negative
Role of financial sector	Positive	
Openness		
Restrictions on openness	Negative	Negative
Institutional Quality	Positive	Negative (governance hypothesis) Positive (outcome hypothesis)
Macroeconomic		
Exchange rates	Positive	Negative
Exchange rate volatility	Positive Negative	Positive Negative
GDP per capita	Positive	Positive Negative
Corporate taxes		Negative

Findings on bilateral variables are mostly in line with previous literature. The negative relationship between distance and cross-border M&A's and the positive relationship between common language and cross-border M&A's is in line with Di Giovanni (2003) and Brakman et.al. (2008). In addition to these papers, this thesis also yields significant (positive) results for regional trade agreements. Results on having a common border and on having a common currency are contrary to their respective hypothesis. For common borders, the effect is positively correlated with cross-border M&A's whereas a negative relationship is hypothesized because other modes of entry are available when there is a common border. This result may indicate that (1) this effect is only relative to other modes of entry and not absolute or (2) that cross-border M&A's are now more important compared to other modes of entry. The unexpected finding on common currency (negative instead of positive) disappears when Great-Britain and USA are removed from the sample.

These baseline results are robust to differences in specifications. In addition to the baseline results, we exclude Great-Britain and the USA from the sample to show the dominance of these two countries on the results of the effect of variables on the *deal values* of cross-border M&A's. Interesting is not just the change in the common currency sign, but also the great rise in importance of the exchange rate volatility when these two countries are not included in the sample. This indicates that firms in either Great-Britain or the USA have hedged against currency shocks quite well, but for firms from countries in the remainder of the sample this is an important reason *not* to do a cross-border M&A or at least to do it with lower *deal values*.

When it comes to the analysis on the factors of production, the baseline results including *all* industries indicate that – both for human capital and physical capital - having these production factors in abundance stimulates receiving cross-border M&A's. However, the expected negative sign for the acquirer country (indicating that this factor of production is insufficiently available in the acquirer country) is found for human capital and not for physical capital. When we analyze only the most physical capital intensive industries and the most human capital intensive industries, these results should be strengthened. For physical capital this is indeed the case; physical capital of the target country is a significant positive determinant of cross-border M&A's, but is insignificant in explaining cross-border M&A's for the acquirer country. For human capital no relationship is found for the most human capital intensive industries, but this is mainly due to the low number of observations.

The findings presented in this thesis give rise to certain policy implications. Even though Schenk (2006) has documented that a large percentage of foreign acquisitions fail to create shareholder value, attracting these deals or acquiring foreign firms might still be attractive for countries. If a country wants their firms to become more attractive to be acquired by foreign firms then it should have (1) a healthy/booming stock market, (2) an open economy, (3) good institutional quality in general and good control of corruption in particular, (4) a depreciated currency, and (5) *an abundance of human/physical capital* (depending on the industry). If a country wants their firms to engage (more extensively) on the international M&A market from the acquirer side, then it should have (1) a booming stock market (relatively higher than target countries), (2) a healthy financial sector, (3) good institutional quality, (4) low levels of short term exchange rate volatility (i.e. a stable currency), (5) high GDP per capita, and (6) *a lack of human/physical capital* (depending on the industry).

Whether the above policy implications are indeed something you want as an acquirer or target country (i.e. do these cross-border M&A's contribute to countries or harm them?) is not included in this thesis and is thus left for future research. Future research on cross-border M&A's could also improve on repeating the factors of production tests for a larger sample to find out whether the findings presented in this thesis are robust. Furthermore, the fact that there seems to be a relationship between physical capital and cross-border M&A's indicates that it is worth controlling for in future researches on the topic. To conclude, future research on cross-border M&A's featuring a recent dataset can provide interesting results by analyzing the effect of the Brexit on cross-border M&A activity in Great-Britain. As shown in this thesis Great-Britain and the USA account for the bulk of the aggregate cross-border M&A deal values, so finding out what the impact of the Brexit on cross-border M&A's is and which countries benefit from this impact is an addition to this thesis.

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Appendix I: Tables & Figures

Table 9: Regional trade agreement (rta) changes post 2006

2011	Canada - Colombia	2009	Peru – Chile
2011	China - Costa Rica	2009	US – Peru
2011	Peru - Korea, rep.	2009	Panama – Honduras
2011	India - Japan	2009	China – Singapore
2011	EFTA - Colombia	2009	US – Oman
2011	EFTA - Peru	2009	EU – Cote d'Ivoire
2011	India - Malaysia	2008	Japan – Philippines
2011	EU - Korea, rep.	2008	ASEAN – Japan
2011	Turkey - Chile	2008	Panama – Costa Rica
2011	Turkey - Jordan	2008	EU – CARIFORUM
2011	Hong Kong, China - New Zealand	2008	Turkey – Georgia
2010	EFTA - Albania	2008	China – New Zealand
2010	EFTA - Serbia	2008	Brunei Darussalam – Japan
2010	Turkey - Serbia	2008	Chile – Honduras
2010	New Zealand - Malaysia	2008	Japan – Indonesia
2010	Chile - Guatemala	2008	Turkey – Albania
2010	Peru - China	2008	EFTA – SACU
2010	Turkey - Montenegro	2008	Panama- Chile
2010	Korea, rep. - India	2008	El Salvador – Honduras
2010	ASEAN – Australia - New Zealand	2008	Pakistan – Malaysia
2010	ASEAN - Korea, rep.	2008	EU – Montenegro
2009	EU – Papua New Guinea - Fiji	2007	Mauritius – Pakistan
2009	Panama - Nicaragua	2007	Japan – Thailand
2009	Colombia – Northern Triangle (El Salvador, Guatemala, Honduras)	2007	Chile – Japan
2009	India – Nepal	2007	Chile – India
2009	Japan – Vietnam	2007	EFTA – Egypt
2009	Japan – Switzerland	2007	Pakistan - China
2009	Peru – Singapore	2007	EAC – accession of Burundi and Rwanda
2009	Canada – Peru	2007	CEFTA
2009	EFTA – Canada	2007	Agadir Agreement
2009	Panama – Guatemala	2007	Egypt – Turkey
2009	MERCOSUR – India	2007	Turkey – Syria
2009	Chile – Colombia	2007	EFTA - Lebanon
2009	Australia – Chile		

Source: (World Trade Organization, 2016)

Table 10: Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
sumdealvalue	5.233	938.039	3.738.796	10.000	7.500.000.000
dealvalue	5.233	313.847	1.417.423	10.000	4.520.000.000
nr_deals	5.233	2.7	5.8	1	123
FD_Market_Cap	242.688	235	3.504	0	101.895
FD_Private_Credit	482.112	46	44	0	312
OP_Openness	434.687	58	21	10,43	98,26
IQ_ILS	328.511	6,31	2,36	0	10
IQ_Regulatory_Quality	317.951	0,69	0,22	0	1
IQ_Control_Corruption	317.951	0,44	0,20	0	1
MV_REER	494.016	102	28	12	483
MV_REERVolatility	427.968	0,048	0,077	0,000015	1,15
MV_GDP_per_capita	519.551	11.347	18.373	129	158.602
MV_Total_Tax	214.271	50	43	7	339
FP_Human_Capital	380.159	2,47	0,57	1,14	3,62
FP_Physical_Capital	469.439	1.081.555	3.812.348	324	4.530.000.000
distw	513.374	7.860	4.487	2	19.650
contig	513.374	0,010	0,10	0	1
comleg	513.359	0,32	0,47	0	1
comcur	513.374	0,016	0,13	0	1
rta	519.262	0,067	0,25	0	1

Table 11: Description of variables used in regressions

Variable	Description
lsumdealvalue	Log of the sum of cross-border M&A deal values (thousands Euros)
dealvalue	Value of a single cross-border M&A for a given country pair (thousands Euros)
nr_deals	Number of cross-border M&A's
lFD_Market_Cap	Log of stock market capitalization ratio (% of GDP)
lFD_Private_Credit	Log of domestic credit to the private sector (% of GDP)
OP_Openness	Restrictions on Openness, KOF index (higher values mean higher levels of openness / less restriction on openness)
IQ_ILS	Index of the integrity of the legal system (higher values mean higher integrity of the legal system)
IQ_Regulatory_Quality	Index of regulatory quality (higher values mean more regulatory quality)
IQ_Control_Corruption	Index of control of corruption (higher values mean more control of corruption / less corruption)
MV_REER	Real effective exchange rate
MV_REERVolatility	Real effective exchange rate volatility
MV_GDP_per_capita	GDP per capita (2005 US dollars)
MV_Total_Tax	Total tax rate (% of commercial profits)
FP_Human_Capital	Index of human capital per person, based on years of schooling and returns to education
lFP_Physical_Capital	Log of the index of capital stock at current PPP's (in 2005 million US dollars)
distw	Weighted distance between countries (km)
contig	Common border (1=yes, 0=no)
comleg	Common legal origin (1=yes, 0=no)
comcur	Common currency (1=yes, 2=no)
rta	Regional trade agreement (1=yes, 2=no)

Table 12: Robustness fixed effects regression results

Dependent variable:	Cross-border M&A (log) sumdealvalue			
Estimation Method	**Heckman**		**Heckman**	
Specification	Regression	Selection	Regression	Selection
	(15)		(16)	
lMV_GDP_per_capita				
acquirer	3.654***	1.081***	2.421	0.706*
target	2.529***	0.311	3.211*	0.812*
lFD_Private_credit				
acquirer	0.220	0.156**	0.0922	0.0717
target	-0.0458	-0.000316	-0.255	-0.0377
OP_Openness				
acquirer	-0.00375	0.00429	-0.0043	-0.00233
target	-0.0143*	-0.00316	-0.0240	-0.00252
IQ_ILS				
acquirer	0.0218	0.0134	0.0871	0.0657
target	0.113	0.0227	0.311	0.00995
IQ_Regulatory_quality				
acquirer	1.908***	0.409**	3.092**	0.519*
target	-1.0245*	0.0384	0.408	0.233
IQ_Control_corruption				
acquirer	1.090*	-0.0544	1.544	-0.216
target	-0.375	-0.263	-0.329	-0.348
MV_REER				
acquirer	0.00151	-0.000201	0.00937	0.00619**
target	-0.00294	0.00115	-0.00921	-0.000519
MV_REERvolatility				
acquirer	-0.546	-0.0951	-1.955	-0.742
target	0.764	0.212	2.762	0.686
MV_Total_Tax				
target			-0.000562	0.00294
FP_Human_capital				
acquirer	-0.0778	0.216	3.971	1.277
target	-1.0439	-0.000893	-0.757	-0.0900
lFP_Physical_capital				
acquirer	0.418	0.00670	-0.0911	0.151
target	-0.148	-0.263	-0.673	-0.0923
l(distw)	-0.923***	-0.364***	-1.030***	-0.364***
contig	0.855***	0.331***	1.495***	0.458***
comcur	-0.503***	-0.194***	-0.0489	-0.105
comlang_off	1.370***	0.513***	1.608***	0.507***
rta	0.405***	0.151**	0.575**	0.171***
Rural_population_both		0.000105***		0.000111**
Time FE	Yes		Yes	
Acquirer FE	Yes		Yes	
Target FE	Yes		Yes	
Observations	3.216	100.109	1.734	58.985
rho	0.99		1.00	

***Significant at the 1 percent level | **Significant at the 5 percent level | *Significant at the 10 percent level

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Appendix II: Country list

AF	*Afghanistan*	CM	*Cameroon*	FJ	*Fiji*
AL	*Albania*	CA	*Canada*	FI	*Finland*
DZ	*Algeria*	CV	*Cabo Verde*	FR	*France*
AD	*Andorra*	KY	*Cayman Islands*	PF	*French Polynesia*
AO	*Angola*	CF	*Central African Republic*	GA	*Gabon*
AG	*Antigua and Barbuda*	TD	*Chad*	GM	*Gambia, The*
AR	*Argentina*	CL	*Chile*	GE	*Georgia*
AM	*Armenia*	CN	*China*	DE	*Germany*
AW	*Aruba*	CO	*Colombia*	GH	*Ghana*
AU	*Australia*	KM	*Comoros*	GR	*Greece*
AT	*Austria*	CD	*Congo, Dem. Rep.*	GD	*Grenada*
AZ	*Azerbaijan*	CG	*Congo, Rep.*	GU	*Guam*
BS	*Bahamas, The*	CR	*Costa Rica*	GT	*Guatemala*
BH	*Bahrain*	CI	*Cote d'Ivoire*	GN	*Guinea*
BD	*Bangladesh*	HR	*Croatia*	GW	*Guinea-Bissau*
BB	*Barbados*	CU	*Cuba*	GY	*Guyana*
BY	*Belarus*	CW	*Curacao*	HT	*Haiti*
BE	*Belgium*	CY	*Cyprus*	HN	*Honduras*
BZ	*Belize*	CZ	*Czech Republic*	HK	*Hong Kong SAR*
BJ	*Benin*	DK	*Denmark*	HU	*Hungary*
BM	*Bermuda*	DJ	*Djibouti*	IS	*Iceland*
BT	*Bhutan*	DM	*Dominica*	IN	*India*
BO	*Bolivia*	DO	*Dominican Republic*	ID	*Indonesia*
BA	*Bosnia and Herzegovina*	EC	*Ecuador*	IR	*Iran, Islamic Rep.*
BW	*Botswana*	EG	*Egypt, Arab Rep.*	IQ	*Iraq*
BR	*Brazil*	SV	*El Salvador*	IE	*Ireland*
BN	*Brunei Darussalam*	GQ	*Equatorial Guinea*	IL	*Israel*
BG	*Bulgaria*	ER	*Eritrea*	IT	*Italy*
BF	*Burkina Faso*	EE	*Estonia*	JM	*Jamaica*
BI	*Burundi*	ET	*Ethiopia*	JP	*Japan*
KH	*Cambodia*	FO	*Faeroe Islands*	JO	*Jordan*

KZ	*Kazakhstan*	NA	*Namibia*	ES	*Spain*
KE	*Kenya*	NP	*Nepal*	LK	*Sri Lanka*
KP	*Korea, Dem. Rep.*	NL	*Netherlands*	KN	*St. Kitts and Nevis*
KR	*Korea, Rep.*	NC	*New Caledonia*	LC	*St. Lucia*
KW	*Kuwait*	NZ	*New Zealand*	SD	*Sudan*
KG	*Kyrgyz Republic*	NI	*Nicaragua*	SR	*Suriname*
LA	*Lao PDR*	NE	*Niger*	SE	*Sweden*
LV	*Latvia*	NG	*Nigeria*	CH	*Switzerland*
LB	*Lebanon*	NO	*Norway*	SY	*Syrian Arab Republic*
LS	*Lesotho*	OM	*Oman*	TJ	*Tajikistan*
LR	*Liberia*	PK	*Pakistan*	TZ	*Tanzania*
LY	*Libya*	PA	*Panama*	TH	*Thailand*
LI	*Liechtenstein*	PG	*Papua New Guinea*	TG	*Togo*
LT	*Lithuania*	PY	*Paraguay*	TT	*Trinidad and Tobago*
LU	*Luxembourg*	PE	*Peru*	TN	*Tunisia*
MO	*Macao SAR, China*	PH	*Philippines*	TR	*Turkey*
MK	*Macedonia, FYR*	PL	*Poland*	TM	*Turkmenistan*
MG	*Madagascar*	PT	*Portugal*	TC	*Turks and Caicos Isl.*
MW	*Malawi*	PR	*Puerto Rico*	UG	*Uganda*
MY	*Malaysia*	QA	*Qatar*	UA	*Ukraine*
MV	*Maldives*	RO	*Romania*	AE	*United Arab Emirates*
ML	*Mali*	RU	*Russian Federation*	GB	*United Kingdom*
MT	*Malta*	RW	*Rwanda*	US	*United States*
MH	*Marshall Islands*	WS	*Samoa*	UY	*Uruguay*
MR	*Mauritania*	SA	*Saudi Arabia*	UZ	*Uzbekistan*
MU	*Mauritius*	SN	*Senegal*	VU	*Vanuatu*
MX	*Mexico*	RS	*Serbia*	VE	*Venezuela, RB*
MD	*Moldava*	SC	*Seychelles*	VN	*Vietnam*
MC	*Monaco*	SL	*Sierra Leone*	YE	*Yemen, Rep.*
MN	*Mongolia*	SG	*Singapore*	ZM	*Zambia*
ME	*Montenegro*	SK	*Slovak Republic*	ZW	*Zimbabwe*
MA	*Morocco*	SI	*Slovenia*		
MZ	*Mozambique*	SB	*Solomon Islands*		