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To merge or not to merge?

A study on financial determinants of cross-border mergers and acquisitions

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Table of Contents

1 Introduction.....	3
2 Literature review	6
2.1 Corporate tax rates.....	6
2.2 Stock market returns.....	8
2.3 Financial depth	10
2.4 Hypotheses	11
3 Data	12
3.1 Dependent variables	12
3.2 Independent variables.....	13
4 Methodology.....	16
5 Results.....	18
5.1 M&A inflow	18
5.1.1 Deal volume.....	18
5.1.2 Deal value.....	20
5.2 M&A outflow	22
5.2.1 Deal volume.....	22
5.2.2 Deal values.....	23
5.3 Discussion of hypotheses	25
6 Conclusion	27
References.....	28
Appendices.....	31

1 Introduction

Globalization of the world economy has opened opportunities for transactions and investments across borders. Following this, the trend of cross-border mergers and acquisitions (M&A) has been increasing and has remained strong, comprising 30% of the total deal value in the global M&A market of \$4.1 trillion in 2018, which has increased by 23% when compared to the previous year (J.P.Morgan, 2019). Furthermore, the importance of cross-border M&A is emphasized through its significant portion in Foreign Direct Investment (FDI), covering 78% of total FDI (Garita & Marrewijk, 2007). When a company engages in a M&A transaction, the company either acquires a target or merges with another entity which results in a change of ownership and control of a corporation. In a typical transaction, there is a buyer, which is referred to as the acquirer or the bidder, and a seller that is often referred to as the target (Berk & DeMarzo, 2017). Cross-border M&A happens when the acquirer and the target come from different national origin or home countries (Kang & Johansson, 2000).

Determinants of M&A have often been explored through numerous studies (Erel, Liao, Weisbach, 2012; Rossi & Volpin, 2004; Neto, Brandao, Cerqueira, 2010). Erel et al. (2012) did a study involving economic, legal and cultural determinants such as GDP per capita, quality of accounting disclosure system and geography, among others. Other than that, a study by Rossi & Volpin (2004) focuses on the legal determinants as they focus on studying the impact of laws and regulation on M&A across different countries. Another study on macroeconomic determinants is also done by Neto et al. (2010), testing for the effect of GDP, GDP growths, investor protection, governance, openness of country towards trade and cultural characteristics. Various determinants have been tested and some are proven to be significant by these studies, among many, and this shows that this topic has been widely researched.

Determinants of M&A has been extensively studied as proven by the ample number of research that has been done on the topic. Most studies in this topic have supported the importance of financial determinants and country-specific characteristics in cross-border M&A, although only a small portion of literature is focusing mainly on financial determinants (Di Giovanni, 2005; Forssbäck & Oxelheim, 2011; Hyun & Kim, 2010). Financial determinants can better reflect financing cost and availability for firms to carry out investments abroad (Forssbäck &

Oxelheim, 2011), thus it is expected that the results of this study would be of use as it can further prove the significance of financial determinants of M&A and allows for better recognition of good investment destinations from a perspective of country-level financing capacities, which may lead to better strategic plans. Based on these, a research question is formulated:

“What are the financial determinants of cross-border mergers and acquisitions?”

To answer the research question, country-level analyses will be done by testing variables of cross-border M&A activity against financial variables. The data used would be in a form of panel data consisting of the different variables. Financial variables that are going to be used are country-level corporate tax rates, stock market returns and financial depth as proxied by the proportion of stock market capitalization in the country’s GDP, as inspired from the research of Di Giovanni (2005) and Neto et al. (2010), which will be retrieved from the OECD database, Global Financial Development report from World Bank and Financial Structure Database of World Bank, respectively. The dependent variables to proxy for cross-border M&A activity would be total deal value and deal volume of completed M&A transactions. The M&A deals included would be those that were carried out in a selection of countries, following the study of Neto et al. (2010), that comprises groups of developed and developing countries based on United Nations’ criteria, announced after the 1st of January 2008 and completed by 31st of December 2018, although only countries with data that are available in the ThomsonOne database will be included. The data of the control variables of GDP, GDP growth and trade openness are obtained from the World Bank Database and that for Human Development Index are taken from the Human Development Report of the United Nations Development Programme.

The methodology used to test the relationship between the number of cross-border M&A deals and the financial determinants will be a country and year (un)balanced panel regression. The analysis would be done for M&A inflow and outflow, following the approach of Neto et al. (2010), with each carried out with two regressions where the dependent variables are the number of M&A deals and value of cross-border M&A deals. This is done because transactions with disclosed deal values are often limited to public companies and using both variables help better explain the effects that are going to be tested. Control variables will be included in the regressions as well.

It is proposed that this study would help in explaining the extent to which financial determinants are relevant in cross-border M&A activity. Based on previous studies, it is expected that the financial determinants that are going to be tested (corporate tax rates, stock market returns and financial depth) will show to have a significant impact on cross-border M&A activity.

2 Literature review

There has been an extensive academic research on determinants of mergers and acquisitions, including those that study the impacts of country-specific characteristics on cross-border mergers and acquisitions. This section discusses previous literature regarding the determinants of cross-border mergers and acquisitions and is then proceeded with the hypotheses of this research. I will focus on three financial determinants: corporate tax rates (2.1), stock market returns (2.2) and financial depth (2.3).

2.1 Corporate tax rates

In deciding which location to invest in, various factors are taken into account by investors and taxes may serve as a disincentive for foreign acquirers to invest in a country. Erel et al. (2012) studied numerous determinants of cross-border M&A and corporate tax rates was included as one of the determinants. From a sample of 56978 cross-border mergers occurring over 1990-2007, it was found that acquirers are more likely to come from countries where their taxes are higher than that of the countries of the targets. Their study showed that there is higher cross-border M&A activity between a country-pair of an acquirer and a target that has higher differences of corporate tax rates and that acquirers are more likely to be from a country with a higher corporate tax rate than that of the targets.

The relationship between corporate taxes and cross-border M&A were also studied in another research by Di Giovanni (2005). The author tested numerous macroeconomic and financial determinants that may affect the flow of cross-border M&A activity which also involves the variable of corporate tax rates, among other variables. The effects of taxes were incorporated by using average corporate tax rates of target countries and a dummy of the presence of a bilateral tax treaty between countries as proxies. It was found that target countries with lower corporate tax rates attract more foreign acquirers and that bilateral tax agreements have a significant positive impact on M&A flows. A suggested reason behind this is that corporate tax rates serve as a disincentive; if these rates are lower in target countries as compared to that of the acquiring country, foreign acquirers may want to take advantage out of this since it may

give more profitable investments for the acquirers. For the effect of bilateral tax treaties, it was suggested that it acts as both an incentive and disincentive, as it can promote the elimination of double-taxation but also decreasing the possibility for multinational firms to avoid taxes by investing abroad.

One limitation that was pointed out in the study of Di Giovanni (2005) was that the case of international double taxation was not tested due to the unavailability of sufficient cross-country basis data. This was then addressed in a later study by Huizinga & Voget (2009) that used a dataset of cross-border M&As that occurred in 1985-2004 in Europe, Japan and the United States, resulting in a total of 30 countries. International double taxation happens when a multinational firm has to pay taxes for their income both in the target country, where a parent company would generate an income from a subsidiary, and in the country of domicile. The authors concluded that international double taxation affects the organizational outcomes of cross-border takeovers and that it has a significant negative effect on the number of foreign acquisitions. It is less likely for countries that have high international double taxations to attract parent companies and organizational outcomes may be affected through international relationships of ownership and control.

The effect of taxes on M&A is further supported by an extensive review by Xie, Reddy & Liang (2017). This study concluded that higher corporate taxes and provincial taxes in countries of target companies have a negative relationship with inward cross-border M&A activity although the extent of the relationship is moderated by the target country's potential and weak institutional laws, potentially through bilateral tax treaties and sources of tax havens between the countries of the acquirer and the target. This result is similar with the study of Rossi & Volpin (2004) that shows higher volume of M&A activity in countries with better investor protection. Rossi & Volpin (2004) also showed that target firms usually have relatively poorer investor protection when compared to that of the acquirers and that there is a possibility of convergence in corporate governance between targets and acquirers, with the convergence usually going towards the standards in the countries of the acquirers.

Furthermore, the negative relationship between corporate tax levels and M&A activity is also supported by Bertrand, Mucchielli, & Zitouna (2007). They studied the determinants of location choices of cross-border M&A by using a dataset of cross-border M&A in the period of 1990-1999 for OECD countries. Two econometric model estimations were used, conditional

logit estimation and count model estimation, to study the probability of a country to be chosen as a location for investment. The results show that higher corporate tax rates reduce the probability for a country to attract M&A. Countries that have lower corporate tax rates are more attractive as a group but the differences within the group are not significant.

The effect of taxation on cross-border M&A is also expected to be similar with the relationship between taxation and FDI, since a significant portion of FDI comes from cross-border M&A. A survey of literature regarding taxation was done by Gordon and Hines (2002) which included the topic of the effect of taxation on FDI. They found that numerous studies showed that there is indeed a significant relationship between taxation and FDI. It was mentioned that an increase of corporate taxes reduces the incentive to invest in a country as it decreases the after-tax return, although it is also pointed out that tax effects might be concealed by prevention carried out by firms through effective methods to avoid international taxes costlessly. Another reason that tax effects might not appear in some analyses is due to various compensation from the governments that may have provided other forms of incentives that are difficult to measure, such as worker trainings and infrastructure. Despite of this, a lot of the empirical studies being surveyed found a correlation between the movements of FDI changes and after-tax rates of return.

2.2 Stock market returns

One can expect that higher stock market returns would attract more investments. In the study of Erel et al. (2012), they found that the difference of the stock market performance between the countries of acquirers and targets has a significant impact on the volume of M&A deals. The stock market performance is measured using the country's stock market returns and the results show that higher difference of stock market performance between the countries affect the inclination for a M&A deal. It was discovered that the country with the higher stock market performance is more likely to purchase firms in the country with lower stock market performance. Two suggested reasons for this result are presented; one of them is that an increase of wealth of the acquirers reduces the cost of capital or the imperfect integration of capital markets in poorer countries makes investments in these countries cheaper for the acquirers (Froot & Stein, 1990 as cited in Erel et al., 2012). Another reason to the relationship found in the study of Erel et al. (2012) is inspired from the model of stock-market-driven acquisitions developed by Shleifer & Vishny (2003). This reason lies on the concept of

mispricing which is based on the market perception and the relative valuations of the resulting combination of the firms after a M&A deal. The study by Shleifer & Vishny (2003) suggested that there might be an overpricing of the acquirers or underpricing of the targets and, as cited in Erel et al. (2012), this might be an underlying reason to the empirical results which showed that there is an impact of difference of stock market performance on cross-border M&A activity as those may indicate good investment opportunity for the acquirer.

The possible reason of mispricing is further proven by Baker, Foley & Wurgler (2004), who found that FDI outflows are strongly related to ex ante mispricing which is proxied by ex post stock market returns. It is concluded that mispricing in a source country is important but that in the host country is not since the results show that overpricing in a source country induces more FDI meanwhile underpricing in a host country does not. These results support the idea that stock market returns affect cross-border M&A, which generally has a significant large portion in FDI.

In an updated study, Baker, Foley & Wurgler (2008) investigated the effect of stock market valuation on FDI and they used the same variable as the one used in their previous study (Baker et al., 2004) of ex post stock market returns to measure ex ante mispricing. Again, they found that there is a significant relationship between stock market returns and FDI, where it was found that before periods of low stock market returns of target countries, FDI levels are high. The conclusion presents that the results support their hypothesis that FDI serves as an opportunity for countries with overvalued firms to use low-cost capital in other countries and that source-country cost of capital is a determinant of FDI.

The explanation offered by mispricing towards the role of stock market returns in cross-border M&A intersects with behavioral finance, which relies on the market perception of value. Harford (2005) tried to find the impact of behavioral factors on merger waves by incorporating 1-year and 3-year average of stock market returns and market-to-book ratios as explanatory variables. The results revealed that there is a positive relationship between these market valuation explanatory variables and merger waves, although the relationship of market-to-book ratio to the wave is stronger than that with stock market returns, since the highest returns of most industries do not come before the merger waves. The paper (Harford, 2005) concluded that the behavioral hypothesis tested only reflect an effect from capital liquidity instead of mispricing.

2.3 Financial depth

Higher liquidity and bigger size of capital markets indicate easier transactions and investment opportunities. This idea provides an underlying reason to the relationship between financial depth with M&A activity. Di Giovanni (2005) tested the impact of financial depth on capital flows in cross-border M&A by using stock market capitalization to GDP ratio. The results were consistent with the hypothesis that financial depth has a positive relationship with outward flows of cross-border M&A, with a stronger effect coming from the stock market rather than the credits market.

Neto et al. (2010) also did a study testing for the macroeconomic determinants of M&A involving stock market capitalization to GDP ratio as inspired from Di Giovanni (2005) and Aminian et al. (2005) (as cited in Neto et al., 2010) that used it to measure financial depth. Moreover, Globerman and Shapiro (2005) also used this ratio to measure liquidity in stock markets. They mentioned that higher stock market liquidity would imply higher inward and outward M&A activity and this is supported by their results that is consistent with the expected relationship between the variables.

Furthermore, in a study regarding corporate financial determinants of FDI, Forssbäck & Oxelheim (2011) used the ratio stock market capitalization to GDP to proxy for financial markets development, which was inspired from Rajan and Zingales (2003) (as cited in Forssbäck & Oxelheim, 2011). The results of the study showed that interactions between financial development and several other corporate financial determinants have a significant impact on the likelihood of a foreign acquisition. This holds the implication that financial determinants are more important in countries that are less developed financially. This relation of financial development with FDI is mainly affected through the sensitivity of FDI on the equity cost.

Another research by Alfaro, Chanda, Kalemli-Ozcan & Sayek (2004) looked into the role of financial markets on FDI and economic growth and it was discovered that FDI promotes economic growth through financial markets. They used value of domestic shares as a proportion of GDP to account for relative market size and the results showed that the interaction term of FDI with relative market size, among interactions with other financial variables, has a

significant impact on growth at a 10% level of significance. It is concluded then that there is a causal relationship between FDI and growth through financial markets.

2.4 Hypotheses

The literature review in the previous section serves as a basis for the hypotheses formulation of this research. The relationships of various financial determinants and M&A activity have been widely studied and this research will focus on three explanatory financial variables, namely corporate tax rates, stock market returns and financial depth. The M&A activity is measured by using two variables; number of M&A deals and M&A deal value in terms of USD. Following Neto et al. (2010), this research will investigate the inflow and outflow investments through cross-border M&A.

For the evaluation of M&A inflows, the following hypotheses are formulated:

H1: Corporate tax rates of a target country have a negative influence on M&A inflow

H2: Stock market returns of a target country have a negative influence on M&A inflow

H3: Financial depth of a target country have a positive influence on M&A inflow

For the evaluation of M&A outflows, the following hypotheses will be tested:

H4: Corporate tax rates of an acquirer country have a positive influence on M&A outflow

H5: Stock market returns of an acquirer country have a positive influence on M&A outflow

H6: Financial depth of an acquirer country have a positive influence on M&A outflow

3 Data

3.1 Dependent variables

Two dependent variables are used as proxies of M&A activity; deal volume and total deal value. This is done because not all deal values are made public and therefore the analysis using the deal volume will allow these deals to be taken into account. Both data were retrieved from ThomsonOne Financial database. The dataset ranges from the period of January 1, 2008 to December 31, 2018 and there are 52 countries that are included in the dataset, which are representative of both developing and developed countries based on the United Nations' criteria, following the ones used by Neto et al. (2010). The list is as below:

Groups	Countries
Developed countries	Germany, Australia, Austria, Belgium, Canada, Denmark, Norway, Slovakia, Slovenia, Spain, United States, Estonia, Finland, France, Greece, the Netherlands, Hungary, Ireland, Israel, Portugal, United Kingdom, Czech Republic, Sweden, Switzerland, Italy, Luxembourg, Japan, New Zealand
Developing countries	South Africa, Argentina, Brazil, Bulgaria, Chile, China, Colombia, Croatia, the Philippines, Hong Kong, India, Indonesia, Malaysia, Mexico, Peru, South Korea, Romania, Russia, Singapore, Egypt, Turkey, Taiwan, Thailand, Venezuela

Table 1: list of countries included in the sample

For M&A inflow, the dataset is grouped by target countries and years, while for M&A outflow, it is grouped by acquirer countries and years. The variable of the deal volume is the sum the number of yearly deals while that of the deal value is the sum of the deal values per year.

The dependent variables are transformed into natural logarithmic forms because the data for the deal volume and deal values, both for inflows and outflows, are skewed to the right and have outliers that might affect the outcome of the regression to reflect a relationship that might be defined by the outliers.

The descriptive statistics for the logarithmic forms of the deal volume and deal values are presented in Table 2 and those for the original forms of the data can be found in Appendix A.

	Mean	SD	Min	Max
Ln Deal Value (inflow)	14.97	1.90	7	20
Ln Deal Volume (inflow)	11.12	1.16	7	14
Ln Deal Value (outflow)	14.54	2.47	7	19
Ln Deal Volume (outflow)	3.64	1.71	0	7
Observations	571			

Table 2: descriptive statistics of dependent variables

It is shown here that the means of the Ln Deal Value for both inflow and outflow are not so far apart with 14.97 and 14.54, respectively. The standard deviation for the Ln Deal Value of inflow is lower than that of the outflow though, meaning that the data points are less widely spread than that of the outflow. This implies that inflow and outflow M&A activities are much less the same although that for the outflow is more volatile. As for the deal volume, the means of Ln Deal Volume for inflow is significantly higher than that of the outflow, although the standard deviation is higher for Ln Deal Volume (outflow) than that of the inflow. This indicates that inflow M&A activity is much higher, although the activity of outflow is still more volatile.

3.2 Independent variables

The main explanatory variables that are of interest are corporate taxes, stock market returns and financial depth. Corporate tax is a tax imposed by the government on income or capital of corporations and the data for this variable is retrieved from the OECD database (OECD, 2019). For stock market returns, the data are obtained from the Global Financial Development report from the World Bank database and it is defined as the growth of the annual stock market index, which is calculated as an average of daily stock market indices in Bloomberg (The World Bank, 2018). Further, the dataset for the variable financial depth is obtained from the World Bank Financial Structure Database (The World Bank, 2018) and is defined as the value of listed shares to GDP that is calculated using a deflation method.

To address the issue of omitted variable bias, control variables are added into the model. These variables include GDP, GDP growth, trade openness and Human Development Index (HDI). Based on the study of Erel et al. (2012), GDP and bilateral trade are significant factors of M&A activity and are therefore included as control variables. To proxy for bilateral trade, trade openness is used and it is defined as the proportion of the sum of export and import of goods and services in GDP. Further, GDP growth is included to account for the growth of the economy which affects the growth of M&A activity and the other independent variables. In addition, HDI is also included to control for human capital and the country's wealth, since the index consists of 3 components of GDP per capita, educational attainment and life expectancy (Neto et al., 2010).

The control variables are obtained from different sources. The data of GDP are obtained from the World Economic Outlook April 2019 report from the International Monetary Fund database (International Monetary Fund, 2019), whereas that for GDP growth are retrieved from the open database of The World Bank (The World Bank, 2019). The data of trade openness are also collected from The World Bank (The World Bank, 2019) and lastly, the data of HDI are retrieved from the Human Development Report of the United Nations Development Programme (United Nations Development Programme, 2018).

The main independent variables and control variables are transformed into logarithmic forms due to the different values of the data where some are far larger than those of the other variables. The descriptive statistics and correlation matrix of the independent variables and the control variables are presented in Table 3.

	Mean (SD)	Min	Max	Ln Corporate Tax	Ln Return	Ln Depth	Ln GDP	Ln GDP Growth	Ln Openness	Ln HDI
Ln Corporate Tax	3.14 (0.32)	2.14	3.88	1.00						
Ln Return	2.28 (1.26)	-4.03	5.30	0.12	1.00					
Ln Depth	3.92 (0.86)	0.15	5.81	-0.01	-0.21	1.00				
Ln GDP	6.17 (1.34)	2.97	9.93	0.28	-0.09	0.27	1.00			
Ln GDP Growth	0.93 (0.86)	-4.26	3.22	0.06	0.02	0.01	-0.02	1.00		
Ln Openness	4.37 (0.64)	3.10	6.09	-0.42	-0.16	0.12	-0.35	-0.03	1.00	
Ln HDI	-0.18 (0.11)	-0.57	-0.05	-0.23	-0.12	0.11	0.18	-0.35	0.36	1.00
Observations	572									

Table 3: descriptive statistics and correlation matrix of independent variables

Overall, the correlation between the independent variables are low ($|x| < 0.29$) although a few are considered as having moderate correlation ($0.3 < |x| < 0.5$). This implies that there should not be any collinearity problems in performing the analysis.

4 Methodology

The aim of this research is to analyze the relationship between M&A activity and financial variables that have been determined in the above sections. M&A activity is going to be operationalized by two dependent variables; M&A deal volume and the total deal value. The three main explanatory variables that are going to be used are country-level data of corporate taxes, stock market return and stock market capitalization.

Panel regression is used to analyze this relationship. To test the first, second and third hypotheses, the equation for the regressions following a fixed effects model would look like this:

$$\begin{aligned} \ln(\text{DealVolume})_{i,y} &= \beta_0 + \beta_1 \ln(\text{CT})_{i,y} + \beta_2 \ln(\text{Returns})_{i,y} + \beta_3 \ln(\text{Depth})_{i,y} + \beta_4 \ln(\text{GDP})_{i,y} \\ &+ \beta_5 \ln(\text{GDPgrowth})_{i,y} + \beta_6 \ln(\text{Openness})_{i,y} + \beta_7 \ln(\text{HDI})_{i,y} + \varepsilon_{i,y} \end{aligned}$$

In the case where a random effects model is more fit, the equation would be:

$$\begin{aligned} \ln(\text{DealVolume})_{i,y} &= \beta_0 + \beta_1 \ln(\text{CT})_{i,y} + \beta_2 \ln(\text{Returns})_{i,y} + \beta_3 \ln(\text{Depth})_{i,y} + \beta_4 \ln(\text{GDP})_{i,y} \\ &+ \beta_5 \ln(\text{GDPgrowth})_{i,y} + \beta_6 \ln(\text{Openness})_{i,y} + \beta_7 \ln(\text{HDI})_{i,y} + u_{i,y} + \varepsilon_{i,y} \end{aligned}$$

The variable $\ln(\text{DealVolume})_{i,y}$ represents the natural logarithm of the deal volume in target country i in year y . The main independent variables are CT that represents the corporate tax rates, $Returns$ that measures the percentage yearly stock market returns and $Depth$ that represents financial depth. Furthermore, the control variables are defined as follows: GDP as the gross domestic product, $GDPgrowth$ as the growth of GDP, $Openness$ as the share of export and import to the country's GDP and HDI as the human development index. The terms $u_{i,y}$ and $\varepsilon_{i,y}$ represent the between-entity error and within-entity error respectively, while the subscripts i,y indicates the target country and year respectively. All variables are used in their

natural logarithmic forms and for analyses using deal values, the same equation applies, although the dependent variable would be $\ln(DealValue)_{i,y}$.

Following the methods used by Neto et al. (2010), either fixed or random effects models are used to test the relationship. Firstly, fixed effects model controls for time-invariant characteristics. It is assumed that these time-invariant characteristics are unique to each country and that it should not correlate with other characteristics of the countries, which implies that the error terms of the countries should not correlate with the regressors. Another one is the random effects model, where it is assumed that variation across countries are random and thus uncorrelated with the predictors in the model. This indicates that differences across countries have some influence on M&A activity.

In order to determine whether a fixed or random effect is more fit for the model, Hausman tests are done for the most complete models, which are those that include all variables. Basically, the test examines whether unique errors are correlated with the regressors. The null hypothesis of this test is that there are no correlation, meaning that the random effects model is more fit if it is not rejected and thus if the test turns out to be rejected, the fixed effects model is more fit.

All models use robust standard errors to reduce the effect of heteroscedasticity. Heteroscedasticity-robust standard errors allow for unbiased estimators in the presence of heteroscedasticity in the models, which are when the variance of the errors are not stable across all observation points.

For the fourth, fifth and sixth hypotheses, the exact same procedure and equation would be used, although the data used for the total deal values and deal volume represent deals that are part of outflow investments and country i represents the acquirer country.

5 Results

In this section, the results of the regressions are presented. Discussion on interpretation and potential explanations regarding the models are also included.

5.1 M&A inflow

5.1.1 Deal volume

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Ln Deal Volume (inflow)						
Ln Corporate Tax	-0.09 (0.21)	-0.12 (0.46)	1.35** (0.55)				0.20 (0.19)
Ln Return		0.02 (0.03)	-0.03 (0.02)	0.02 (0.03)	-0.02 (0.02)		
Ln Depth			0.34*** (0.13)		0.22* (0.12)	0.20* (0.10)	0.21** (0.10)
Ln GDP	0.12 (0.16)	-0.13 (0.23)	-0.35 (0.33)	-0.13 (0.23)	-0.34 (0.36)	-0.03 (0.16)	-0.03 (0.16)
Ln GDP Growth	0.04** (0.02)	0.02 (0.02)	0.04* (0.02)	0.03 (0.02)	0.03 (0.02)	0.03 (0.02)	0.03 (0.02)
Ln Openness	0.38 (0.33)	0.62** (0.30)	0.60* (0.33)	0.64** (0.30)	0.38 (0.37)	0.41 (0.35)	0.44 (0.36)
Ln HDI	-0.02 (1.52)	2.93 (2.56)	1.24 (2.19)	2.94 (2.59)	1.88 (2.38)	0.97 (1.42)	1.13 (1.43)
Constant	9.04*** (1.78)	10.16*** (2.84)	5.51* (2.98)	9.70*** (2.00)	11.23*** (3.19)	8.99*** (1.73)	8.23*** (2.01)
Observations	413	210	184	210	184	357	357
R ²	0.03	0.06	0.16	0.06	0.09	0.06	0.06

Robust standard errors in parentheses

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

Table 4: regression results of a fixed effects model for M&A inflow, where the dependent variable is the natural logarithm of the yearly total inflow of M&A deal volume between 2008-2018 in target country i . The independent variables that show significant effects are Ln Corporate Tax, Ln Depth, Ln GDP Growth and Ln Openness. The entire sample of cross-border deals is included in all regressions.

The R squared in the tables represent the proportion of the variance of Ln Deals (inflow) that is explained by the independent variables. It is shown here that the value of the R squared for

the most complete model is 0.16, which means that 16% of the variance of Ln Deals (inflow) is explained by the independent variables in the model. The other models have R squared ranging from 0.03 to 0.09, implying that the independent variables in the models explain 3% to 9% of the variance of the dependent variables.

Table 4 presents the regression results where the measure of M&A activity used is deal volume. Based on the Hausman test (see Appendix C), it is deemed that the fixed effects model is more fit and is thus the model presented in the table above. The model is built gradually, with control variables included in all regressions, to allow for analyses of the effects of each variable of interest. Firstly, the coefficients for Ln Corporate Tax show mixed results. It is shown in column 1 and 2 that it does not have a significant effect on M&A, although both coefficients are shown to have negative signs which align with the hypotheses. Meanwhile in column 3, Ln Corporate Tax is shown to have a significant positive impact on M&A activity, where a percentage increase on corporate tax results in an increase of 1.35% on M&A activity. It is implied that corporate tax has a positive effect on M&A which may suggest that high corporate tax rates do not discourage acquirers to do a M&A transaction. In contrast with previous literature, Di Giovanni (2005) found that average corporate tax rates of target countries have a significant negative impact of M&A flows. Secondly, Ln Return do not have any significant impact on inflow M&A activity. It is shown in column 2-5 that the coefficients for this variable are not significantly different from 0 which implies that stock market returns of the country do not have any influence on M&A activity. It can be interpreted then that acquirers do not take the factor of the stock market returns of the country into account when acquiring firms. However, Erel et al. (2012) found that the difference of the stock market performances between the acquirer and target countries has a significant positive influence on M&A activity, which implies that higher stock market returns of target countries should decrease M&A flows. As for financial depth, the coefficients of Ln Depth are significant at 1%, 5% and 10% in column 3, 5, 6 and 7. In column 3, it is presented that a percentage increase on financial depth results in an increase of 0.34% on inflow M&A activity. It can be inferred then that financial depth has a significant influence on inflow M&A activity, which agrees with previous literature (Di Giovanni, 2005; Neto et al., 2010) that emphasized the role of financial markets development and activity in influencing FDI and M&A activity positively.

The control variables that have significant effects on the deal volume are GDP Growth and Trade Openness, both having positive effects on the deal volume. The coefficients of Ln GDP Growth have positive signs in all the models, although its effect is only deemed to be significant in columns 1 and 3, where it is interpreted that a percentage increase in GDP Growth would lead to 0.04% increase in the deal volume of M&A inflow. Furthermore, Trade Openness is also shown to have significant influence in some of the models, as presented in columns 2, 3 and 4, where it shows that a percentage increase in Trade Openness results in an increase of 0.62%, 0.60% and 0.64% of the deal volume of M&A inflow respectively.

5.1.2 Deal value

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Ln Deal Value (inflow)						
Ln Corporate Tax	-1.17** (0.48)	-0.48 (0.96)	0.57 (1.34)				-0.38 (0.49)
Ln Return		-0.03 (0.05)	-0.06 (0.05)	-0.04 (0.04)	-0.05 (0.05)		
Ln Depth			0.98** (0.42)		0.92** (0.39)	0.95*** (0.24)	0.94*** (0.24)
Ln GDP	0.82* (0.44)	1.34* (0.77)	1.88** (0.83)	1.34* (0.77)	1.88** (0.83)	1.03** (0.40)	1.04** (0.40)
Ln GDP Growth	0.04 (0.07)	0.03 (0.07)	0.03 (0.08)	0.03 (0.07)	0.03 (0.08)	-0.01 (0.07)	-0.01 (0.07)
Ln Openness	0.46 (0.63)	2.46** (1.03)	2.17* (1.13)	2.55*** (0.93)	2.08* (1.05)	0.75 (0.52)	0.69 (0.54)
Ln HDI	-7.46** (3.70)	-10.84* (6.38)	-10.53 (6.87)	-10.81* (6.39)	-10.28 (6.95)	-5.27 (3.37)	-5.58 (3.49)
Constant	10.27** (5.02)	-4.31 (8.16)	-13.67* (7.90)	-6.24 (6.40)	-11.23* (6.36)	0.63 (3.18)	2.08 (3.70)
Observations	407	205	180	205	180	352	352
R ²	0.03	0.08	0.11	0.08	0.10	0.09	0.09

Robust standard errors in parentheses

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

Table 5: regression results of a fixed effects model for M&A inflow, where the dependent variable is the natural logarithm of the yearly total inflow of M&A deal value between 2008-2018 in target country i. The independent variables that show significant effects are Ln Corporate Tax, Ln Depth, Ln GDP, Ln Openness and Ln HDI.

The R squared of the regression of the most complete model (column 3, Table 5) is 0.11, meaning that 11% of the variance of M&A inflow deal values is explained by the independent variables in the regression. The other models have R squared ranging from 0.03 to 0.10.

Since the Hausman test (see Appendix C) showed that fixed effects model is more fit, Table 5 presents only the regression output for the fixed effects model, where the measure of inflow M&A activity is the transaction deal value. In column 1, it is shown that Ln Corporate Tax has a significant negative influence on inflow M&A activity. This coefficient means that a percentage increase of corporate tax rate results in a decrease of 1.17% of inflow M&A activity, which indicates that acquirers may be discouraged to acquire firms in target countries with high corporate tax rates. This conforms to the results of Di Giovanni (2005) that show that lower average corporate tax rates of target countries attract more acquirers. However, in column 2 and 3 it is shown that corporate tax rates do not have significant impact on inflow M&A activity. For stock markets return, it is shown in all models that it does not have a significant impact on inflow M&A activity. Meanwhile, as mentioned in the previous section, previous literature (Erel et al., 2012; Baker, Foley & Wurgler, 2004) found that stock market returns have significant positive influence on M&A activity. As for financial depth, all models that include Ln Depth show that it has a significant influence on inflow M&A activity at significance levels of 1% and 5%. All models show that it has a positive influence on M&A inflow activity. It can be interpreted from columns 3, 5, 6 and 7 that a percentage increase of the measure of financial depth results in an increase of 0.98%, 0.92%, 0.95% and 0.94% in M&A inflow activity respectively. This result is aligned with previous literature (Di Giovanni, 2005) which presents that countries with higher financial depth attracts more acquirers.

The control variables that are shown to have significant influence on the inflow M&A deal value are GDP, Trade Openness and HDI. Ln GDP is significant at 5% to 10% significance levels throughout the models. The coefficients represent the magnitude of the increase in percentage of the deal value when there is a percentage increase of GDP. For example, in column 1, it is interpreted that a percentage increase in GDP would result in an increase of inflow M&A deal value by 0.82%. Another control variable that is significant is Trade Openness. It has a significant impact in 4 of the models with significance levels ranging from 1% to 10%. In these models, it is presented that a percentage increase in the measure of Trade Openness increases the inflow M&A value by 2.46%, 2.17%, 2.55% and 2.08% as shown in columns 2-5. Further, HDI is also shown to have a significant influence in 3 of the models and

all the effects are negative on inflow deal value. In columns 1, 2 and 4, it is displayed that a percentage increase in HDI would result in a decrease of inflow M&A deal value by 7.46%, 10.84% and 10.81%, respectively.

5.2 M&A outflow

5.2.1 Deal volume

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Ln Deals (outflow)						
Ln Corporate Tax	0.16 (0.30)	0.21 (0.41)	0.10 (0.63)				0.05 (0.30)
Ln Return		-0.01 (0.02)	-0.00 (0.03)	-0.01 (0.02)	-0.00 (0.02)		
Ln Depth			0.15 (0.25)		0.14 (0.21)	0.17 (0.13)	0.17 (0.14)
Ln GDP	-0.19 (0.24)	-0.57 (0.35)	-0.59 (0.37)	-0.46 (0.36)	-0.59 (0.36)	-0.31 (0.25)	-0.31 (0.26)
Ln GDP Growth	0.03 (0.03)	0.01 (0.03)	0.01 (0.03)	0.02 (0.03)	0.01 (0.02)	0.04 (0.03)	0.04 (0.03)
Ln Openness	-0.23 (0.33)	-0.00 (0.28)	-0.06 (0.28)	-0.07 (0.30)	-0.08 (0.32)	-0.26 (0.30)	-0.26 (0.30)
Ln HDI	-0.63 (1.65)	-0.87 (2.82)	0.23 (3.28)	-1.45 (2.77)	0.27 (3.26)	-0.04 (1.70)	0.00 (1.75)
Constant	5.30** (2.20)	6.50** (2.66)	6.97* (3.71)	6.67** (2.99)	7.40** (3.08)	6.12*** (2.16)	5.93** (2.53)
Observations	411	210	184	210	184	355	355
R ²	0.01	0.06	0.07	0.05	0.07	0.03	0.03

Robust standard errors in parentheses

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

Table 6: regression results of a fixed effects model for M&A outflow, where the dependent variable is the natural logarithm of the yearly total outflow of M&A deal value between 2008-2018 in acquirer country i . All independent variables show no significant effects on M&A outflow.

The R squared of all the models are regarded to be modest, with its values ranging from 0.01 to 0.07.

Table 6 presents the fixed effects model of the regression, since it is suggested by the Hausman test (see Appendix C) that this model is the more fit one to be used for analysis. It is shown

here that none of the variables have any significant effects on M&A activity. Thus, based on this regression results, it is interpreted that none of these variables contribute as factors that influence M&A activity. This is in contrast with previous literature that found significant influences from these variables. In a panel analysis of the determinants of cross-border M&A that includes fixed effects of country pair and year, Erel et al. (2012) found significant influences coming from the differences of stock-market returns, log GDP per capita and GDP growth between acquirer countries and target countries on M&A activity. Erel et al. (2012) also found a positive significant effect coming from the difference of corporate income tax rates between acquirer and target countries on M&A activity in their cross-sectional analysis of M&A determinants. This difference of results might be due to the limitation of the fixed effects model that does not capture the differences of countries and the movement of variables that change slowly.

5.2.2 Deal values

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Ln Deal Value (outflow)						
Ln Corporate Tax	-0.30 (0.81)	-0.71 (0.98)	-0.32 (1.00)				0.01 (0.94)
Ln Return		0.19** (0.08)	0.20** (0.09)	0.19** (0.08)	0.19** (0.09)		
Ln Depth			0.85*** (0.31)		0.87*** (0.31)	0.83*** (0.27)	0.83*** (0.27)
Ln GDP	0.68** (0.29)	0.78*** (0.30)	0.54** (0.27)	0.75** (0.30)	0.52** (0.27)	0.46* (0.26)	0.46* (0.28)
Ln GDP Growth	-0.01 (0.09)	-0.03 (0.09)	-0.05 (0.09)	-0.03 (0.09)	-0.05 (0.09)	-0.03 (0.09)	-0.03 (0.09)
Ln Openness	-0.17 (0.62)	-0.15 (0.75)	-0.79 (0.77)	-0.03 (0.76)	-0.75 (0.76)	-0.62 (0.67)	-0.62 (0.65)
Ln HDI	-0.71 (2.31)	1.06 (2.55)	2.06 (2.35)	1.32 (2.48)	2.19 (2.29)	-0.57 (2.09)	-0.59 (2.21)
Constant	11.72*** (4.48)	12.33** (5.69)	12.14** (6.15)	9.79** (4.97)	10.99** (5.04)	10.86** (4.43)	10.81** (4.99)
Observations	369	188	171	188	171	326	326
R ²	0.00	0.03	0.06	0.03	0.06	0.02	0.02

Robust standard errors in parentheses

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

Table 7: regression results of a fixed effects model for M&A outflow, where the dependent variable is the natural logarithm of the yearly total outflow of M&A deal value between 2008-

2018 in acquirer country i. The independent variables that show significant effects on M&A outflow activity are Ln Return, Ln Depth and Ln GDP.

The highest R squared value is that for the regression in column 3 and 5, with a value of 0.06, meaning that 6% of the variance of the dependent variable is explained by the independent variables in the model. It is shown that the R squared ranges from 0.00 to 0.06.

Table 7 displays the random effects model for deal values of M&A outflows. The Hausman test (see Appendix C) showed that this model is more fit than the fixed effects model to be used for analysis. For the main independent variables of interest, those representing stock markets returns and financial depth are significant at a significance level of 1% and 5%, respectively, in all regressions that include these variables. For the variable of Ln Return, the coefficients show that a percentage increase of stock market returns increases outflow M&A activity by 0.19%, 0.20%, 0.19% and 0.19% respectively, as shown in columns 2-5. This corresponds to the results found by Baker et al. (2004) that concludes that stock market returns of a source country is important in inducing FDI outflows. In regards of financial depth, it is interpreted that a percentage increase of the measure of financial depth increases outflow M&A activity by 0.85%, 0.87%, 0.83% and 0.83%, as shown in columns 3, 5, 6 and 7. This agrees with the results of Di Giovanni (2005) which shows that financial depth has a positive influence on cross-border M&A outflows. Lastly, in contrast with previous studies as mentioned in previous sections (Erel et al., 2012; Di Giovanni 2005), the results for corporate tax rates show that it has no significant influence on outflow M&A activity.

The control variable that has a significant impact on outflow M&A deal value is only GDP. GDP has significant effects as shown in all the regressions in the table with significance levels ranging from 1% to 10%. The effects are all positive and the magnitude of it ranges from 0.46% to 0.78%.

5.3 Discussion of hypotheses

The discussion of how the results are related with the hypotheses is presented in this section.

Firstly, the hypotheses related with M&A inflow are discussed, which involves H1, H2 and H3. In regards of corporate tax rates, it is shown that the variable has mixed results. In the case of deal volume, the models involving corporate tax rates either show that the coefficients are not significantly different from zero or that it has a positive effect on inflow M&A deal volume. Moreover, for inflow M&A deal value, only one of the models show that corporate tax rates have a negative impact on the deal value whereas the coefficients of this variable in the other models do not show to have significant impact at all. Due to the mixed results and that only one regression model supported the hypothesis, it is concluded that H1 is rejected. The reason for this might be that fixed effects models do not work well with variables that are changing slowly over time, which is the case with corporate tax rates. The panel regression might not capture the effects of corporate tax rates as a determinant of the activity of M&A inflow. Other than that, country level stock market return was shown to have no significant impact at all on M&A inflow. This leads to a rejection of H2, which implies that stock market returns of the target country is not an important determinant of M&A inflow. Previous literature (Erel et al., 2012; Shleifer & Vishny, 2003) highlighted that the role of stock market returns in target countries are driven by the perception of acquirers and market players on whether the targets are cheap or underpriced. This implies relativity on the value of investments in target countries, which suggests that the stock market performance in the acquiring countries may be more significant in being a determinant of M&A activity. For financial depth, all models involving the variable show that it has positive and significant impacts on M&A inflow and thus H3 is not rejected. This is aligned with previous literature that highlights the importance of the activity of financial markets, where markets with higher liquidity and bigger size of capital markets make target countries more attractive for acquirers to invest in.

Next, hypotheses and conclusions related with M&A outflow are discussed. The results show that corporate tax rates are not significant in all the models, which leads us to the rejection of H4. There are two possible reasons for this; the first one is that corporate tax rates change slowly over the years and the effect of this variable on M&A outflow might not be captured by the fixed effects model, which is the same reason as that proposed for M&A inflows. Another reason would be that the effect of corporate tax rates may be relative. Erel et al. (2012) tested

the effect of corporate tax rates by using the difference of the rates between that of the acquiring countries and the target countries, in which the results show that bigger differences of corporate tax rates result in higher M&A activity. Following this reasoning, the level of corporate tax rates of the acquiring country in itself might not have that big of a role in determining M&A outflow activity. Aside from corporate tax rates, country level stock returns seem to have a significant role in determining M&A outflow. The results of the random effects model with M&A deal values as the dependent variable (see section 5.2.2) suggests this although the fixed effects model in section 5.2.1 does not. The reason that the fixed effects model does not support this might be that the differences in characteristics between the entities/countries have significant influences on the dependent variable and the effects of variables that move slowly over time are not captured. In contrast, the impact of stock market returns is reflected in random fixed effects model, which shows that the variable is significant at a significance level of 5% and that it has a positive effect in all regressions that include it. Due to this, H5 is not rejected; countries with higher stock market returns are more likely to have higher capital and thus leads to a higher tendency to invest abroad. This is also in line with the findings of Froot & Stein (1990) as cited in Erel et al. (2012), that the cost of capital for the acquirers is reduced due to the increase of wealth and investments in poorer countries are perceived to be cheaper. For the last hypothesis, it is found that financial depth plays an important role as a determinant of M&A outflow as presented by the random effects model. This is not reflected in the fixed effects model and the same reason as that for H5 is thought to be the cause for this. In section 5.2.2, it is shown that financial depth has a positive significant influence at a significance level of 1% in all the models involving the variable. Following this, H6 is not rejected and this indicates that financial depth is an important determinant of M&A outflow. Market players in countries with financial markets that are more developed are more likely to invest abroad because transactions and identification of investment opportunities are easier. Level of liquidity is also more likely to be higher in financial markets that have higher financial depth in comparison with those with lower financial depth.

6 Conclusion

In summary, the findings in this research suggest that corporate tax rates do not have significant impact on both M&A inflow and outflow, stock market returns are only significant for M&A outflow and that financial depth is significant for both M&A inflow and outflow. From the perspective of country-level financing capacities, these findings suggest that some financial determinants have different importance in M&A inflow and outflow. Based on the results, corporate tax rates are not significant for both M&A inflow and outflow and thus market players should not take into account the corporate tax rates of the acquiring and target countries independently. However, it might be useful to see the difference between the levels of corporate tax rates of the acquirer and target countries, as it may reflect investment opportunities. As for stock market returns, companies that are looking for acquirers may look at countries with higher stock market returns, as investors in these countries are more likely to invest abroad and generate M&A outflow due to higher amount of capital available. Lastly, financial depth is concluded to be an important determinant for both acquirer and target countries. Investors and companies looking for opportunities should look at countries with higher financial depth as there is much higher probability for transactions in countries with more developed financial markets.

This research has some limitations which can be improved for further research. One limitation is the availability of data of variables that are not included in the research. Although control variables are included, this still leaves open the problem of omitted variable bias. Some variables that might be useful to be added would be those related with legal determinants and debt levels in the private sector. Another suggestion for further research would be an analysis of determinants across industries (e.g. whether determinants in more research-intensive industries are different than in other industries) and across specific regions. In addition, a study on how financial determinants influence the probability of M&A transactions across countries would also be an interesting research topic.

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Appendices

	Mean	SD	Min	Max
Deal value (inflow) (USD thousands)	11482992.67	27587963.18	0	390000000
Deal volume (inflow)	127686.62	175410.01	1000	1400000
Deal value (outflow) (USD thousands)	11543164.42	23855824.10	0	194160402
Deal volume (outflow)	128.35	237.46	1	1674

Appendix A: descriptive statistics of dependent variables before logarithmic transformation

	Mean	SD	Min	Max
Corporate tax rate (%)	24.27	7.14	8.50	48.32
Stock market return (%)	2.13	22.44	-63.16	200.184
Financial depth (%)	69.36	56.39	1.16	333.88
GDP (USD thousands)	1289.01	2720.87	19.54	20494.05
GDP growth (%)	2.19	3.47	-14.72	25.12
Trade openness (%)	99.66	81.44	22.11	442.62
HDI	0.84	0.09	0.56	0.95

Appendix B: descriptive statistics of independent variables before logarithmic transformation

Models tested	p-value
Table 4	0.0001
Table 5	0.0478
Table 6	0.0000
Table 7	0.1514

Appendix C: results of Hausman tests of the fixed and random effects models