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The BRICS effect: volume and determinants of M&A activity in emerging countries.

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Abstract

This paper studies the volume of mergers and acquisitions activity in BRICS and emerging countries. The whole sample includes 14.164 transactions from 2000 to 2017. The empirical evidence shows that the volume, measured as yearly value of deals to GDP, is larger in BRICS countries compared to the level in the rest of emerging countries. Additionally, the determinants of M&A activity are analyzed using a panel data approach. If these determinants for BRICS have a special effect is also studied. Firstly, macro-economic factors are considered. The results show that some of them, like GDP growth, influence the level of M&A activity. Moreover, the variables that analyze the interaction between these factors and BRICS countries are significant, so they might influence the difference found in the volume of M&A activity. Secondly, business environmental factors are examined. However, few significant results are found.

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1 Introduction

Substantial research has been carried through to provide a deeper insight about mergers and acquisitions (M&A) activity. A considerable proportion of the investigations has focused on event studies, to analyze abnormal returns. Likewise, a growing percentage of literature is exploring the determinants of local and cross-border M&A activity. Two main hypotheses have been formulated to explain it, the neoclassical and the behavioral theory. The former one suggests that macro-economic and business environment variables influence the volume of this activity. At the same time, the behavioral hypothesis supports miss-valuation, empire building and hubris arguments, just as the determinants of M&A activity.

Furthermore, in 2001 the leading emerging countries, Brazil, Russia, India and China were referred for the first time as BRIC by Jim O'Neil. One of the main reasons why they have been grouped together, is their projected growth rate. The rate is expected to be higher than the one from some world leading economies (those that are part of the G7). In 2006 the BRICS hold their first Foreign Ministers' Meeting, where a cooperation process among them was initiated. In addition, in 2011 South Africa was invited to join this selective group due to its growth potential. By 2017, a deep level of cooperation has been reached yielding to positive results. For example, their economic aggregate has increase from 12% to 23% and their international trade has increased from 11% to 16% (BRICS China, 2017). Hence, due to its economic forecast, BRICS are recognized and treated as a distinct group from emerging countries.

As BRICS are considered the leading emerging countries, it is interesting to assess how their special position impacts M&A activity. In particular, is the volume of M&A activity larger in BRICS compared to the rest of emerging countries? Furthermore, as stated by the neoclassical theory, structural economic and institutional factors have an impact on M&A activity. Then, do these factors actually drive the differences/ similarities in M&A volume?

In this paper a sample of M&As announced between 2000 and 2017, completed as for December 2018, is analyzed. The sample (14.164 deals) comprises 26 emerging countries. The so-called BRICS (Brazil, Russia, India, China and South Africa) are among them. This research claims to contribute to the M&A research field by (1) comparing the volume of total (*Volume*) and cross-border (*CrossVolume*) transactions between BRICS and a selection of emerging countries, (2) analyzing the macro-economic and business environment determinants of volume of M&A activity, and (3) test, by interaction terms, if these variables have a specific effect in BRICS countries.

This research dwells upon the study of two volume measurements, total volume of activity (defined as the variable *Volume)* and cross-border volume *(CrossVolume)*. *Volume* is defined as yearly value transactions to GDP. *CrossVolume* is calculated considering those deals where the acquirer and the target company are from different countries. The transactions details are retrieved from Thomson One. To compare the volume of transactions, a difference in means (t-test) and a difference in medians tests (Wilcoxon-test) are performed. Furthermore, to test the impact of the macro-economic environment as well as the one of the business environment, a panel data approach is followed.

Firstly, the evidence suggests that the *Volume* (volume to GDP) is higher in BRICS countries. However, the results are not statistically significant when studying the cross-border measure (*CrossVolume)*. Second, the outcomes obtained partially support the idea that the volume of M&A transactions is influenced by the macro-economic environment, such as *GDP growth* which has a positive effect. However, unexpected results are found for *Inflation Rate* and *Lending Interest Rate,* which have a positive and significant impact on M&A activity in some model specifications. Moreover, the interaction terms, intended to study the specific effect of these variables in BRICS countries are significant. *GDP growth, Depreciation* and *Openness in BRICS* have a negative and significant impact on the volume of M&A activity. Most of these results are consistent for both volume measurements under study (*Volume* and *CrossVolume*).
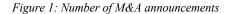
Next, the business environment determinants are analyzed. In order to test them, the Economic Freedom Index is used, which is annually published by the Heritage Foundation. The results exhibited show little support for the hypothesis that states that the volume of M&A activity (*Volume*) and cross-border transactions (*CrossVolume*) are determined by the business environment. One important finding suggests that the higher the level of taxation in BRICS, the lower the level of M&A activity.

Therefore, the evidence is partially consistent with the neoclassical hypothesis, suggesting that the macro-economic situation has an impact on M&A activity and that its influence is different for the so-called BRICS. Yet, this is not the case for the majority of business environment variables.

The remaining of the paper is structured as follows: section 2 briefly describes and reviews the theoretical framework and formulates the hypotheses. Section 3 presents the data (dependent and independent variables) and the methodology. Section 4 displays and discusses the main results (empirical evidence). Section 5 analyzes robustness checks, section 6 states the limitations and section 7 concludes.

2 Theoretical framework

Since 2000 the worldwide M&A activity has significantly increased, not only in number but also in value (IMAA, 2019). As it can be observed in figure 1, this quantitative tendency has also been present in emerging and BRICS countries (Brazil, Russia, India, China and South Africa). Deals involving an emerging country continue to account for a growing share of M&A activity. Moreover, more than 60% of total deal value in emerging market transactions can be traceable to BRICS countries (BCG, 2013).

Figure 1: Number of M&A announcements

Source: Own elaboration-Information Thomson One

Furthermore, the BRICS are considered leading emerging economies and political powers not only at regional level but also at international level. It is stated, that their high growth rates, economic potential and demographic development enhance their leading position (BRICSCCI, 2019). It is predicted that by 2050, they will be the leading world economies (Wilson et al., 2003). Jim O'Neil, in his paper named Building Better Global Economic BRICs (2001), was the first one who used the acronym BRIC. In this research, it is stated that when analyzing the size of the GDP based on

Purchasing Power Parity (PPP), BRIC economies are larger than some of the ones who are part of the G7[1], classifying them as the larger emerging economies.

Moreover, while low GDP growth is expected for most of G7 countries, just Brazil from the BRIC group is projected to experience a GDP growth similar to the one of the G7 countries (O'Neil, 2001). Nevertheless, it is highlighted that in order to achieve a high growth rate, these countries should ensure a wide range of conditions regarding macro-economic stability, institutional capacity, openness and education (Wilson et al., 2003). The importance of a stable macro environment and efficient institutions lays on their positive impact on the level of investment, and hence the economic growth.

While the first BRIC meeting was held in 2006, the first Summit was in 2009. Since then, it is an annual event. South Africa was incorporated in 2011. Together, they make up for 42.6% of the world population and account for 26.5% of world land area. The IMF estimates that these countries produced 22.53% of the world GDP in 2015 and that more than 50% of world economic growth during the last 10 years can be assigned to them (BRICS China, 2017). Additionally, they possess a vast amount of natural resources and have an important share of world trade (16% by 2017).

In 2006 the first step towards a cooperation process between BRICS was initiated. The collaboration has become deeper and more substantial resulting in effective and meritorious outcomes. In 2017, BRICS countries claimed for upholding world peace (aiming for diplomatic and political settlements of disputes), promoting common development (macro-economic policy coordination, financial integration and infrastructure connectivity among BRICS) and improving global economic governance (to provide emerging markets with a higher representation in international affairs), among other objectives (BRICS China, 2017).

Some of the measures that have been taken by this group of countries include the formulation of Strategy for BRICS Economic Partnership, which details systematic plans to strength economic cooperation and to promote integrated trade and investment markets. In order to encourage a global economic governance and the development of emerging market the New Development Bank and Contingent Reserve Arrangement were created. Therefore, the BRICS countries are not only considered as leading emerging countries by international actors, but also, they position themselves in this role.

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[1] G7: Formed by Germany, USA, Canada, France, Italy, Japan and United Kingdom. They meet annually to discuss about economic and political international issues.

There are numerous potential reasons why managers get involved in M&A transactions. The main ones are related to gains through synergies (the value of the combined entity exceeds those of the previously separate components), increase in market power and competitiveness, economies of scale and scope and complementary assets, among others. All these factors are in line with the Neoclassical hypothesis. This theory suggests that structural changes at industry level and macro-economic factors might influence the level of M&A activity. Other reasons why these deals are carried out are: risk diversification, tax benefits, overinvestment (empire building), claims of management inefficiency, misvaluation (stock prices) and hubris (overconfidence).

A considerable amount of studies has been carried out to provide a deeper insight into and for a better understanding of this activity. Some of them were focused on value creation, performing event studies and analyzing the reaction of the acquirer and the target price upon the announcement of the deal. In general, these studies signal that the abnormal returns for the target company are strongly positive, while the cumulative abnormal returns around the announcements are close to zero or even negative for the acquiring firm (Andrade et al., 2001). This implies that most of the gains are accrued to the target company. Consistent findings have been found by Kinateder et al. (2017) when analyzing average abnormal returns for domestic acquisitions where the acquirer and target company are based in a BRICS country.

Research on M&A activity has spawned large numbers of papers that seek to explain their determinants and the pattern that they follow. Some of them dwell upon the explanation of waves in this activity, of which two have been deeply analyzed. The first one: the behavioral explanation states that mergers' waves follow periods of high stock returns. This theory is related to the managerial timing of market overvaluation. As stock returns are high, it is a good strategy to use them as a payment method, to merge with another company. The second explanation, supported by the Neoclassical hypothesis, suggests that economic, technological and regulatory shocks lead to industry reorganization and asset reallocation. Resulting in a merge wave, where in general transactions are clustered by industry. (Andrade et al., 2001).

In line with this research field, Mitchell and Mulherin (1996) analyze the relation between industry shocks and merger activity in the US Public Utility sector. In particular, they show that after the deregulation implemented in this sector during 1992, the deals are larger, more frequent, geographically varied and operationally focused. Furthermore, Harford (2005) tests both hypotheses, however, just evidence for the neoclassical explanation is found. According to the results, merger waves occur in response to industry shocks, conditioned to the existence of enough capital liquidity.

Other papers have focused on cross-border M&A activities showing that macro-economic, financial and institutional variables play an important role in determining their size and direction. Rossi and Volpin (2004) conducted a study with 49 countries all over the world in which it is proved that better accounting standards and stronger shareholder/investor protection cause a larger volume of M&A activity. Moreover, evidence was found that financial market development in the acquiring country plays an important role in M&A flows. In addition, it has been demonstrated that distance-related investment costs have a negative impact on this activity, whereas cultural similarities like common language have a positive effect (Di Giovanni, 2005).

Corresponding to this research field, Piñeiro et al. (2008) find empirical evidence that emphasizes the relevance of capital markets´ growth and quality in 9 emerging economies. In particular, its quality has a stronger positive impact. In addition, Pablo (2009) performs a panel data research in which it is shown the importance of considering macro-economic and business-related variables when getting involved in a cross-border transaction in Latin America. Furthermore, the extent to which international factors influence cross-border deals has been studied. Finding that the geographical distance plays an important role. Additionally, a higher economic development and better accounting standards increase the likelihood of being an acquirer rather than a target. Moreover, currency movements are an important factor in determining the pattern of these transactions (Erel, Liao and Weisbath, 2010).

To sum up, several studies have been carried out to identify the determinants of M&A transactions and to find evidence that supports one of the two main hypotheses proposed to explain them, the neoclassical and the behavioral one. Some have found empirical evidence which suggests that economic factors (GDP growth, interest rates, unemployment rate and inflation rate, among others) play an important role not only in determining M&A activity as a whole but also in cross-border deals. (Andrade et al., 2001; Di Giovanni, 2005; Piñeiro, Chaitanya and Tamazian, 2008; Wang, 2008; Pablo, 2009; Cortés, Agudelo and Mongrut, 2012). However, to the best of my knowledge, none of these investigations explore if there is a difference in the volume of M&A activity among a set of countries categorized as emerging and the ones so-called BRICS. As they are considered the leading countries in this categorization, they have committed to mutual cooperation, and they have contributed to 50% of the economic growth during the last decade, it will be explored if there is empirical evidence supporting the following hypothesis:

Hypothesis 1: The volume of M&A activity (including local and cross border deals) and the volume of cross-border transactions in BRICS is larger than in the rest of emerging countries.

In line with previous research, the macro-economic determinants of these transactions are explored and an analysis regarding the different role they play, between these groups, is performed.

Hypothesis 2: The total volume of M&A activity and cross-border transactions are influenced by macro-economic factors, which play a more important role in BRICS countries.

Other papers, stressed the importance of institutional and business environment, including the level of investors protection, accounting standard and global competitive index among others (Rossi and Volpin, 2004; Pablo, 2009; Erel, Liao and Weisbach, 2010; Cortes, Agudelo and Mongrut, 2012). In general, the empirical evidence supports the idea that a better business environment has a positive impact on M&A activity. Therefore, it is expected that these factors play a significant role in determining the M&A activity in the studied countries as well. Furthermore, as mentioned above, BRICS countries must have strong institutions in order to achieve high growth rates. The better they are, the higher the incentives to invest, then they might impact the level of M&A activity. Additionally, they have been cooperating in order to make institutional improvements and to construct a more comprehensive partnership.

Hypothesis 3: The M&A activity and cross-border transactions are determined by the strength of institutional factors and the business environment. These variables have an important impact on BRICS countries.

3   Data and Methodology

In this section the data and the methodoly used in this research is described. It is divided into three parts, in the first one, the data gathering for the dependent variables and their construction is explained. The second one is divided in two sub-sections, one which defines and describes the macro-economic variables, and the other one does it for the environmental business variables. In the third part, the methodology is presented.

3.1   Dependent Variable

The sample contains the information concerning M&A announcements between January 1st 2000 and December 31st 2017, completed as for December 31st 2018, obtained from the database Thomson One. As the aim of the paper is to study transactions motivated by a change in control, only those ones

where the acquirer owns more than 50% of the target company's shares after the deal and less than 50% before it, are included (M&A of majority interests).

The countries under study are all considered emerging countries according to MSCI (2019). They are: Argentina, Brazil, Chile, China, Colombia, Czech Republic, Egypt, Greece, Hungary, India, Indonesia, Malaysia, Mexico, Pakistan, Peru, Philippines, Poland, Qatar, Russia, Saudi Arabia, South Africa, South Korea, Taiwan, Thailand, Turkey and United Arab Emirates (UEA). The sample is divided in two, the first group is composed of BRICS countries (Brazil, Russia, India, China and South Africa) and the second one consists of the other countries previously mentioned. Since now, they are referred to as emerging countries.

In addition, as usual, the following transactions are omitted: leveraged buyouts (LBOs), spin-offs, recapitalizations, repurchases, and privatizations (Cortés et al., 2012). Also, strictly regulated industries or industries with special accounting are excluded (financial services, utilities, education and health companies).

The sample comprises a total of 14.164 M&A announcements. As detailed in table 1, BRICS countries account for the larger amounts of transactions, altogether they represent 56.8% (8025 deals). In particular, 6.2% of the deals have taken place in Brazil, 3.2% in Russia, 6.3% in India, 37.6% in China and 3.5% in South Africa. Moreover, some countries stand out from the rest, as is the case of South Korea (11.3%), and Malaysia (5.8%)

In the following table the total amount of M&A transactions categorized by country group, and local/cross-border deals are presented. As stated, BRICS account for 8025 deals (57%), 1683(21%) of them are cross-border. 6139 transactions have taken place in the rest of emerging countries during 2000-2017, 35% of them are cross-border.

Table 2: Number of deals per category (2000-2017)

Category	Local	Cross-Border	Total
BRICS	6342	1683	**8025**
Emerging countries	4020	2119	**6139**
Total	**10362**	**3802**	**14164**

Source: Own elaboration-Thomson One Data

Table 1: Number of M&A announcements (2000-2017)

Country	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total	%
Argentina	21	21	15	10	8	3	20	19	18	12	25	25	18	10	5	7	19	15	**271**	**1.9**
Brazil	52	40	21	27	22	32	44	84	76	59	65	78	59	59	36	38	48	31	**871**	**6.2**
Chile	12	5	6	9	12	11	7	15	10	22	27	28	24	26	13	11	9	9	**256**	**1.8**
China	31	44	61	102	121	108	121	164	208	236	344	466	414	471	578	753	633	471	**5326**	**37.6**
Colombia	1		2		12	5	6	15	11	16	17	23	21	9	7	3	4	2	**154**	**1.1**
Czech Republic	10	18	7	3	5	6	10	11	16	14	20	10	6	4	3	6	7	4	**160**	**1.1**
Egypt	4	4	4	1		1	4	2	7	2	6	5	5	3	4	11	4	5	**72**	**0.5**
Greece	8	11	6	7	3	5	8	8	11	10	10	8	5	4	6	2	6	5	**123**	**0.9**
Hungary	8	2	3	3	3	8	6	1	1	2	1	3	1	5		4	2	1	**54**	**0.4**
India	42	35	36	42	33	52	57	63	61	50	61	55	46	42	50	60	60	42	**887**	**6.3**
Indonesia	10	13	11	7	15	9	18	17	28	38	48	53	34	21	17	12	22	11	**384**	**2.7**
Malaysia	38	44	40	39	62	43	60	59	57	58	55	49	29	36	36	29	34	46	**814**	**5.8**
Mexico	16	17	21	20	24	19	37	40	39	30	43	35	21	26	21	21	18	19	**467**	**3.3**
Pakistan	2	1						1	1	1	1	1		1	1		4	1	**15**	**0.1**
Peru	5	2	3	4	14	9	7	16	11	13	18	15	22	14	12	10	8	5	**188**	**1.3**
Philippines	5	6	1	7	4	7	9	7	5	4	8	13	15	2	6	7	6	11	**123**	**0.9**
Poland	25	15	27	19	11	16	19	28	42	30	33	26	15	23	37	42	22	25	**455**	**3.2**
Qatar									1				1			1			**3**	**0.0**
Russia	14	9	16	16	22	30	45	32	26	22	38	38	29	22	28	12	25	26	**450**	**3.2**
Saudi Arabia	1						4		1	4	2	2	2	2	4	4	1	6	**33**	**0.2**
South Africa	42	26	18	15	12	20	29	29	29	24	41	35	37	30	24	34	23	23	**491**	**3.5**
South Korea	25	44	24	17	21	20	96	103	140	132	137	136	103	90	92	147	142	134	**1603**	**11.3**
Taiwan	10	17	11	10	13	21	15	11	23	20	24	9	28	23	25	36	27	14	**337**	**2.38**
Thailand	5	7	17	12	28	17	12	13	15	10	26	13	21	23	16	12	12	17	**276**	**1.9**
Turkey	3	5	3	8	5	11	11	22	19	20	23	26	21	25	30	26	18	9	**285**	**2.0**
UEA	1	4	1	1	5	1	3	5	6	3	9	5	7	2	3	5	4	1	**66**	**0.5**
Total	**391**	**390**	**354**	**379**	**455**	**454**	**648**	**765**	**862**	**832**	**1082**	**1158**	**983**	**973**	**1054**	**1293**	**1158**	**933**	**14164**	

Source: Own elaboration – Thomson One Data

Following Rossi and Volpin (2004), *Volume* is defined as the percentage of value deals to GDP and *CrossVolume* is calculated considering just those transactions where the acquirer and the target company are from different countries. As mentioned above, the initial sample includes a total of 14.164 M&A deals, 5.6% of which have a public company as the target (795 deals). Table 3 shows the number of announcements per country between 2000 and 2017 and the amount of them that are classified as public. In addition, the *Volume* measure per country is exhibited. The cross-border ratio *(CrossBorder)* is defined as the percentage of merger and acquisition transactions that involve two companies from different countries. The number of cross-border deals is 3.802 corresponding, the average among countries is 26.8%.

Table 3: M&A deals

Data on mergers and acquisitions by country. CrossBorder is defined as the percentage of cross border deals among all completed transactions per country. Volume is the average of the percentage of the value transaction in local currency over nominal GDP in local currency by country. Cross Volume is calculated considering transactions where the acquirer and the target company are from different countries.

Country	# Deals	# Public Deals	CrossBorder (%)	Volume	CrossVolume (%)
Argentina	271	3	66.42	0.095	0.081
Brazil	871	39	43.97	0.230	0.104
Chile	256	14	51.17	0.010	0.001
China	5326	61	13.52	0.047	0.008
Colombia	154	9	68.18	0.001	0.001
Czech Republic	160	8	60.63	0.015	0.014
Egypt	72	15	52.78	0.178	0.157
Greece	123	18	16.26	0.404	0.096
Hungary	54	4	72.22	0.004	0.004
India	887	151	28.64	0.005	0.002
Indonesia	384	18	48.70	0.000	0.000
Malaysia	814	24	19.90	0.130	0.060
Mexico	467	15	73.02	0.030	0.015
Pakistan	15	5	60.00	0.001	0.001
Peru	188	18	66.49	0.158	0.098
Philippines	123	12	35.77	0.004	0.002
Poland	455	49	25.27	0.061	0.031
Qatar	3		33.33	0.024	0.024
Russia	450	26	30.00	0.030	0.004
Saudi Arabia	33		39.39	0.021	0.012
South Africa	491	43	38.90	0.101	0.055
South Korea	1603	126	8.61	0.001	0.000
Taiwan	337	81	30.27	0.026	0.002
Thailand	276	32	34.06	0.009	0.001
Turkey	285	24	43.51	0.101	0.065
UEA	66		81.82	0.016	0.013

source: Own elaboration- Thomson One data

3.2 Independent variables

Macro-economic environment variables

Pablo (2009) characterized uncertainty as an economy which has high inflation, expensive cost of funding (lending interest rate), currency depreciation and volatile growth rate, among others. Except for the GDP growth rate, a higher value implies a worse or less desire economic environment. The following variables are considered to test the second hypothesis.

GDP growth: On the one hand, it is expected that economic development will increase M&A activity, because a growth in GDP in the target country has a positive impact on outward acquisitions. Furthermore, in fast-growing countries (emerging markets) acquisitions are a quick instrument to obtain market share and take advantage of opportunities. (Brouthers et al.,2000; Wang, 2008; Boateng et al., 2014). On the other hand, an increase in GDP might have a positive impact on demand, which might encourage the establishment of new businesses, greenfield investments, detrimental to M&A activity. It is expected that the smaller the growth rate, superior the likelihood that mergers will be a more attractive strategy to further develop firm size. (Gort, 1969; Brouthers et al., 2000; Neto et al., 2009). The GDP growth rate is retrieved from the World Bank.

Interest rate/Lending Interest Rate: Low-interest rates are a sign of a better economic environment. Moreover, they are a proxy of transaction costs and funding. So, a negative relation between the interest rate and the M&A activity is expected. (Hardford, 2005; Pablo, 2009; Cortés, Agudelo & Mongrut, 2012). The interest rate is measured through the Lending Interest Rate, retrieved from the World Bank database[23].

Depreciation (Exchange rate): currency strength affects the effective price of a transaction, its costs, financing and the profits repatriated to the acquirer company. A domestic currency appreciation might, on the one hand, cause an inflow of international capital, due to a potential increase in profits. But on the other hand, it may stimulate the acquisition of foreign companies. (Kiymaz,2004; Wang, 2008). Contrarily, a domestic currency depreciation reduces transaction and funding costs (Boateng et al., 2014; Lopez, 2016). The currency exchange rate (local currency against US dollar) data is obtained from Datastream and the *Depreciation* is calculated as the percentage difference between two years, a positive number corresponds to currency depreciation.

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[2] Data for Saudi Arabia, Taiwan, Turkey and UEA is missing

Inflation Rate: Acquisition decisions are influenced by inflation as it affects the return on investments and the costs of capital. These effects are explained by Fisher equation on nominal interest rates (a measure of cost of capital), which states that in the presence of inflation, the real interest rate is lower than the nominal rate. (Boateng et al., 2014). Furthermore, high inflation can be a sign of the absence of commitment and discipline in monetary policy. The inflation rate is considered as a proxy for economic stability. Therefore, high inflation rises uncertainty, negatively affecting FDI and lowering the real value of earnings in local currency. (Yang et al., 2000; Lopez, 2016; Swamy et al., 2017). Consequently, a negative relation between M&A and inflation rate is expected. The *Inflation Rate* is calculated as the percentage of annual change in CPI (base 2010) retrieved from the World Bank database[3].

Openness: it represents a proxy to country's trade restrictions. On the one hand, it is expected to have a positive effect on attracting foreign direct investments (FDI), along with a positive impact on M&A activity. (Globerman et al., 2005; Neto et al., 2009). On the other hand, Yang et al. (2000) state that there is a negative relationship between FDI and the openness measure as it can be interpreted as a way of avoiding trade barriers. *Openness* is defined as the sum of exports and imports as a share of GDP (Neto et al., 2009). The data is gathered from the World Bank[4].

In the following table, the average by country for the different economic variables included are presented. The countries with a higher *GDP growth* are Qatar, China and India. The ones with higher *Inflation Rate* are Argentina, Turkey and Russia. The countries with higher *Lending Interest Rates* are Brazil, Peru and Argentina. The *Depreciation* is higher in Argentina, Turkey and South Africa. The countries with a higher degree of *Openness* are Malaysia, Hungary and UEA.

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[3] Argentina's data is retrieved from FACPCE
[4] Data for Taiwan is missing

Table 4: Macro environment variables

This table exhibits the average rate for macro-economic variables per country (2000-2017)

Country	GDP growth (%)	Inflation (%)	Lending interest rate (%)	Depreciation (%)	Openness (%)
Argentina	2.48	18.68	19.47	22.72	33.11
Brazil	2.48	6.65	48.00	4.24	25.54
Chile	3.90	3.23	8.14	1.69	66.67
China	9.28	5.18	5.60	-1.08	48.68
Colombia	4.07	2.36	13.63	3.96	36.70
Czech Republic	2.88	2.21	5.60	-1.68	127.62
Egypt	4.29	9.75	12.81	0.88	47.36
Greece	0.23	2.08	8.36	0.82	57.06
Hungary	2.16	4.71	8.35	2.40	148.75
India	7.06	6.45	11.00	4.43	43.06
Indonesia	5.28	6.99	14.24	0.62	53.07
Malaysia	5.11	2.32	5.63	4.16	172.54
Mexico	2.20	4.62	7.29	4.50	60.42
Pakistan	3.66	8.87	12.04	-0.64	30.94
Peru	4.96	2.81	21.28	1.56	46.72
Philippines	5.30	3.84	8.12	1.56	80.98
Poland	3.72	2.62	11.08	0.25	80.50
Qatar	11.57	5.93	5.59	0.00	93.95
Russia	3.85	11.16	13.91	5.65	52.83
Saudi Arabia	3.69	3.19		0.00	79.28
South Africa	2.89	5.41	11.53	6.58	58.90
South Korea	4.13	2.58	5.67	0.19	83.13
Taiwan	3.70	0.94		-0.25	
Thailand	4.04	2.15	5.34	-0.54	127.98
Turkey	5.25	16.37		14.11	48.45
UEA	4.46	2.73		0.00	140.96

Source: Own Elaboration. DataStream and World Bank databases.

Business environment variables

According to the Heritage Foundation (2019), there is a positive connection between the economic freedom and a wide range of constructive social and economic goals. Policies that improve it tend to be associated with superior economic and social progress. Investor protection might affect the volume of M&A activity as it influences the magnitude of frictions and inefficiencies in a country. Rossi and Volpin (2004) find empirical evidence supporting the idea that countries with better investor protection have more volume of transactions.

The business risk and investor protection differ significantly among nations. To assess the business environment, this paper uses The Economic Freedom Index published annually by the Heritage Foundation as a proxy (Wang, 2008; Pablo, 2009; Cortés et al., 2012). It examines the economic and entrepreneurial environment of 180 countries all over the world. It has 4 main pillars, Rule of Law

(property rights and corruption), Government Size, Regulatory Efficiency and Market Openness. Each pillar has three indices, some of them are selected as representative. Each of the indices takes a value from zero to a hundred.

If the overall score is between 80–100, the country is considered free, if it is between 70–79.9 it is classified as mostly free, for a score between 60–69.9 as moderately free, for 50–59.9 as mostly unfree and if it is scored around 0–49.9 it is considered repressed.

First, as part of the Rule of Law pillar, two indices are selected. The first one, *Property Rights*, which measures the degree to which the legal framework allows people to acquire, embrace, and employ private property. It assesses not only the country's laws but also to which level those are respected. The second one is *Government Integrity;* corruption and the lack of government integrity reduce public trust and economic vitality[5].

Concerning Regulatory Efficiency, the *Business Freedom* Index is chosen. It measures the degree to which the regulatory and infrastructure environments constrain the efficient operation of businesses. Cortés et al. (2012) find a negative relationship between this index and M&A activity, suggesting that a greater facility for establishing and running new businesses promotes greenfield investments.

Regarding, the Market Openness pillar, the *Investment Freedom* Index is selected. It measures a wide range of regulatory limitations that are imposed on the flow of investment capital, taking into account the treatment of foreign investment, restrictions on land ownership, foreign exchange and capital controls, among other restrictions.

Finally, for the Government Size pillar, the *Tax Burden* Index is selected. A high government size has a negative impact on incentives and a crowding out effect. A high tax rate in the target country provides a disincentive to M&A activity (Di Giovanni, 2005). This index reflects marginal tax rates on corporate and personal revenue and the general level of taxation as a percentage of gross domestic product. Cortés et al. (2012) use a Fiscal Free Index and finds a positive relation between it and M&A activity, indicating that low tax rates incentivize this activity.

In table 5 the country averages for the chosen economic freedom indices are shown. UEA, Malaysia and Taiwan have the highest *Overall Score* (which is computed as an equally weighted average from

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[5] Due to the high correlation between these two indices, property rights and government integrity, the latter one is not included in the regressions. Correlations are shown in the appendix.

the twelve indices.) The *Property Rights* and *Government Integrity* indices are led by Chile, Malaysia, Taiwan and UEA. The countries with higher *Business Freedom* are South Korea, Taiwan and UEA. The ones with greater *Investment Freedom* are Hungary, Chile and Czech Republic. Last, the ones with higher *Tax Burden* are Qatar, South Arabia and UEA.

Table 5: Business environment variables

This table exhibits the average rate for business environment variables per country (2000-2017)

Country	Overall score	Property rights	Government integrity	Business freedom	Investment freedom	Tax burden
Argentina	53.37	29.02	30.37	64.90	48.33	69.23
Brazil	58.44	50.00	38.13	60.09	50.28	75.98
Chile	77.46	87.96	71.77	71.64	77.50	76.78
China	52.96	25.46	35.20	51.43	28.89	69.24
Colombia	65.44	43.36	35.74	77.82	65.63	74.03
Czech Republic	69.33	70.02	46.01	68.84	72.22	74.37
Egypt	55.29	39.14	31.55	58.85	52.06	80.14
Greece	58.46	50.69	42.31	73.12	56.94	61.18
Hungary	66.70	57.60	36.40	61.80	80.00	78.60
India	53.13	50.86	31.93	47.95	39.17	76.37
Indonesia	55.43	32.13	25.04	52.26	38.61	80.41
Malaysia	74.50	83.80	54.80	83.90	60.00	85.60
Mexico	65.14	50.45	33.71	73.60	58.89	77.22
Pakistan	54.40	36.00	27.30	55.30	55.00	78.50
Peru	66.10	39.35	37.88	65.51	66.94	80.08
Philippines	59.06	36.62	28.54	54.41	45.56	77.64
Poland	63.09	58.93	46.07	64.59	62.50	70.41
Qatar	67.83	63.33	66.00	66.93	40.00	99.77
Russia	58.20	48.70	38.10	77.00	30.00	85.80
Saudi Arabia	63.38	45.17	43.72	73.07	37.92	99.59
South Africa	63.42	50.98	46.51	72.12	53.89	68.57
South Korea	69.52	74.04	49.85	83.29	69.72	72.06
Taiwan	71.89	73.14	58.40	81.02	63.61	77.06
Thailand	67.10	48.60	34.70	77.20	55.00	81.30
Turkey	67.10	48.60	34.70	77.20	55.00	81.30
UEA	77.60	76.30	77.30	79.90	40.00	98.40

source: Own elaboration. Heritage Foundation data

Control variables

As control variables, the natural logarithm of GDP (*Ln(GDP)*) and money supply *(Broad Money)* are included. The *Ln(GDP)* is used as a measure of the size of a nation's overall economy. In order to be able to compare it between countries and to include real growth, a constant USD dollar measure is

taken. It is expected that a large market size will attract FDI, due to economies of scale and agglomeration economies.

Furthermore, the money supply is included as a liquidity measure. Following Piñeiro et al. (2008) we take the percentage of broad money to GDP *(Broad Money)* as a proxy. They find a positive relationship between money supply and cross border M&A inflows. Moreover, Harford (2005) highlighted the importance of capital liquidity in addition to an industry shock to generate an M&A wave.

Finally, following Pablo (2009), in order to make a broad inspection about macro-economic and business environment variables in each category of countries, in table 6 the ones from BRICS countries are compared to those of emerging ones. A difference in means (t-test) and in medians (Wilcoxon test) tests are performed.

In panel A, variables regarding the economic environment are presented, all of them, except for (currency) *Depreciation*, present a difference in means between the two categories of countries under study. The *GDP growth in BRICS* countries is 5.11%, which is greater than the one from emerging countries (3.85%). The average *GDP growth in BRICS* is mainly driven by China (9.28%) and India (7.06%). At the same time, emerging countries, on average, have a lower *Inflation Rate* and *Lending Interest Rate.* While the higher level of *Inflation Rate in BRICS* can be explained by the rate in Russia (11.16%), the greater measure of *Lending Interest Rate* is due to Brazil[6] (48%). Likewise, emerging countries have a higher level of *Openness*.

In panel B business environment variables are analyzed. The outcomes suggest that on average the emerging countries have a better business environment. They have a higher *Overall Score*, higher level of *Property Rights* and *Government Integrity*. Additionally, the indices representing the regulatory environment and openness, *Business Freedom* and *Investment Freedom* respectively, are stronger in emerging countries. Nevertheless, the government size (*Tax Burden*) is higher in them.

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[6] The Lending Interest Rate has been historically high in Brazil. Some of the reasons behind it might be: the hyperinflation crisis experienced, the low national saving rate (which pressures the level of interest rates) and the high share of subsidized and directed lending. Additionally, it is claimed that the lack of competition among banks contributes to high interest rates. The Brazilian banks federation states that the high rates are not due to lack of competition, but they are caused by taxes, high default rates and the regulation.

Table 6: Means and medians difference tests

This table compares country-specific macro-economic and business environment variables. Countries are characterized as BRICS or Emerging countries. The means are exhibited, and the standard deviations are in parenthesis. The p-values of a t-test for difference in means and the p-value for a difference in medians (Wilcoxon test) are reported.

Variable	Mean BRICS	Mean Emerging Countries	P-value T-test	Z-value Wilcoxon test	P-value Wilcoxon test
Panel A					
Macro-economic					
GDP growth	5.11(3.83)	3.85(3.34)	0.002	3.07	0.002
Inflation rate	6.97(3.80)	5.18(8.88)	0.063	7.05	0.000
Lending interest rate	18.52(17.01)	10.38(6.28)	0.000	3.53	0.000
Depreciation	3.97(15.84)	2.91(16.31)	0.582	0.34	0.737
Openness	45.8(13.37)	81.28(44.07)	0.000	-7.60	0.000
Panel B					
Business Environment					
Overall score	57.23(4.35)	65.31(7.64)	0.000	-9.18	0.000
Property rights	45.20(10.70)	54.74(18.84)	0.000	-3.35	0.001
Government integrity	37.97(5.68)	42.88(14.84)	0.002	-1.01	0.314
Business freedom	61.72(12.58)	70.13(11.35)	0.000	-5.70	0.000
Investment freedom	40.44(12.12)	58.24(13.72)	0.000	-9.81	0.000
Tax burden	75.19(7.64)	78.54(9.38)	0.002	-3.08	0.002

source: Own elaboration.

3.3   Methodology

First of all, in order to test the first hypothesis (the volume of M&A activity in BRICS is larger than in the rest of emerging countries) a difference in means test and a Wilcoxon rank-sum test (non-parametric test) are performed, not just for the absolute amount, but also for two volume measures, *Volume* (Volume to GDP), which is the percentage of yearly value transactions to GDP and number of deals to population (# *Deals to Population*), calculated as the ratio of number of deals divided by population (in millions).
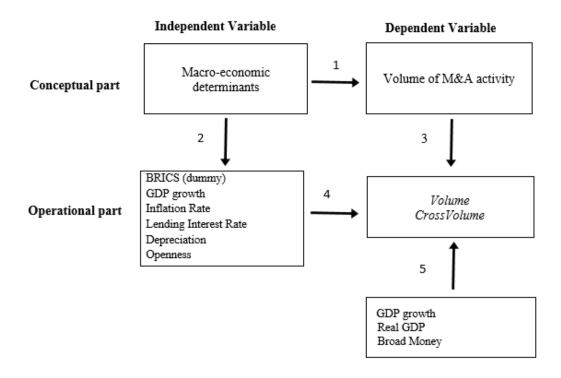
When using a parametric test (t-test) generalizations for making statements about the mean of the population are provided. The underlying assumptions are that the variable follows a normal distribution and its mean is known or assumed. In contrast, to perform a non-parametric test, no assumptions about the population are made (there is no complete information). Furthermore, the measure of central tendency is the median.

Secondly, to test the other two hypotheses, an unbalanced panel data model[7] is used to test the determinants of the volume of M&A activity including macro-economic and business environment variables. The general model uses the following specification:

$$Y_{it} = \alpha + \beta X'_{it} + \mu_{it}$$

Y_{it} represents the two dependent variables analyzed, which are the volume of M&A activity *(Volume)* and the volume of cross-border M&A activity (*CrossVolume*), for the country i in the year t. X' represents a vector of independent (explanatory) variables. Firstly, macro-economic determinants of these activities are tested, including *GDP growth*, *Inflation Rate*, *Lending Interest Rate*, *Depreciation* and *Openness* as proxies for economic (un)certainty. Secondly, the business environment factors are analyzed. The variables used as representative are *Property Rights*, *Business Freedom*, *Investment Freedom* and *Tax Burden*. μ_{it} represents the error term. The models are pictured in figures 2 and 3.
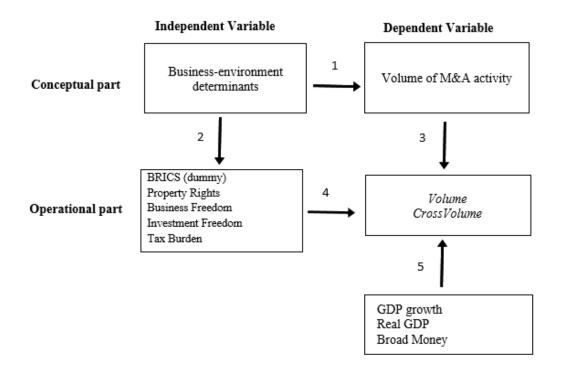
Figure 2: Libby boxes. Second hypothesis

[7] The data has not the same number of observations for each cross-sectional unit, as there are missing observations for some variables in some countries.

The decision to use a panel data analysis is based on the following arguments. Theoretically, the use of this approach is justified if the specification test advocates the rejection of the null hypothesis of equal individual effects. Practically, panel data models have some advantages. They embody information across time and space, so the data includes both times series and cross-sectional elements. Panel data analysis allows for more data variability, fewer multicollinearity problems, the revelation of individual heterogeneity (individual-specific characteristics are not captured in the regressors) and more efficiency (Tong et al., 2008; Neto et al.,2009).

Figure 3: Libby boxes. Third hypothesis

In the different specifications, fixed effects might be included. They examine if intercepts vary across groups (countries) or time periods, so they inspect individual differences in intercepts, assuming the same slopes and constant variance across individuals. Fixed effects explore the relationship between predictors and outcome variables within an entity, the effect of time-invariant characteristics that are unique to the individual are removed from the predictor variables. (the variation across different entities is not analyzed). The pure effect of the variable is estimated, controlling for unobserved heterogeneity. The incorporation of time fixed effects is due to unexpected variation or special events/crisis. During the period analyze several crises have affected different countries (dot com crisis 2000-2002, financial crisis 2008, sovereign debt crisis 2009).

Furthermore, when performing the regressions, interaction terms are included. They provide a better understanding of the relationships among variables. The idea is to test if each variable has a special or different effect for emerging countries in general and for BRICS countries in particular. So, they are incorporated in the analysis to test the hypothesis that the relationship between M&A activity and the macro-economic and business environmental variables is different if the target country is considered to be part of the so-called BRICS.

Finally, robust standard errors are calculated when using a panel data approach as by their use it is possible to relax the assumption of independence of observations. They just require that observations are independent across clusters. They are typically larger than standard errors, so are considered to be conservative.

4 Results

In this section the outcomes of the regressions performed are displayed and analyzed. It is divided into three parts, in the first one, the difference in total and cross-border volume of M&A activity between BRICS and emerging countries is tested using the difference in means and difference in medians tests. In the other two sections, the results from the panel data analysis are presented. While the first one describes the macro-economic determinants, the second one shows the impact of business environment variables in the volume of transactions. The outcomes of these models are exhibited for both, total volume of M&A activity (*Volume*) and cross-volume transactions (*CrossVolume*).

4.1 Difference in volume

In order to test if the amount and volume of M&A activity are larger in BRICS countries (first hypothesis) a difference in means test (parametric test) and Wilcoxon rank-sum test (non-parametric test) are performed. Two different measures of volume are analyzed. The first one, *Volume* (Volume to GDP), is calculated as the percentage of value transactions over GDP. This measure represents the part of the country's wealth that is generated by M&A activity. The second measure, *# Deals to Population*, is calculated as a ratio of the number of deals divided by population (in millions). The incorporation of this second ratio, which is informative, to scale the number of deals to the size of the population. As the idea is to measure the *Volume* of M&A activity, respects to its value, the first ratio, *Volume* (Volume to GDP) is used to analyze the determinants of this activity. If the focus would be more on the amount to deals, the second ratio would be a better indicator.

Table 7 shows the outcomes for the t-test (difference in means test). In panel A the results for the total (amount) volume of transactions are presented. It is exhibited that on average, the amount of deals and *Volume* (Volume to GDP) are significantly larger in BRICS countries, while the measure of the number of deals over population (*# Deals to Population*) is significantly smaller in them. These outcomes might suggest that the size (value) of the deals in these countries is larger than the one in the rest of emerging countries, even after taking into account the size of the economy (controlling for GDP). Additionally, although the amount of transactions is higher in BRICS, when it is scaled to population, as they account for more than 40% of world's inhabitants, the resulting ratio is small.[8] Furthermore, in panel B the results for cross-border activity are displayed. It is stated that the amount of cross border transactions is significantly larger for BRICS countries, but when analyzing the *CrossVolume* (Cross-border volume to GDP) it is suggested that it is higher, although the difference is not significant. Likewise, when examining the ratio of the number of deals to population (*# Cross-border Deals to Population*) the measure is significantly smaller for BRICS countries.

Table 7: T-test unequal variance

T-test difference in means analysis, assuming different variance between groups is performed. The difference between BRICS and emerging countries is calculated for the number of deals per country per year, the Volume (calculated as the percentage of deal value over GDP) and the number of deals to population (in millions). These measures are calculated for the total amount of transactions (Panel A) and for cross-border transactions (Panel B)

	Mean BRICS	Mean Emerging Countries	Diff	T-value	P-value Diff=0	P-value Diff>0
Panel A: Total M&A transactions						
# Deals	89.166	17.743	71.424	4.69	0.000	0.000
Volume (Volume to GDP)	0.083	0.059	0.024	1.42	0.156	0.08
# Deals to population	0.244	0.525	-0.281	-4.45	0.000	1
Panel B: Cross-border M&A transactions						
# Cross-border Deals	19.405	6.651	12.754	12.4	0.000	0.000
CrossVolume (Cross-border volume to GDP)	0.038	0.036	0.002	0.227	0.820	0.410
#Cross-border deals to population	0.086	0.215	-0.13	-5.2	0.000	1

Moreover, the difference in medians test is performed and the results are exhibited in table 8. In panel A the outcomes of the total (amount) volume of transactions are exhibited. The medians between the two categories of countries are significantly different. It is stated that the probability of the median being higher for BRICS is 67.2% when the *Volume* (Volume to GDP) measure is analyzed, and 35.8% when the number of deals to population (*# Deals to Population*) is considered. Furthermore, in panel B the results for cross-border transactions are displayed. The outcomes are consistent with the

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[8] On average BRICS countries have 583.33 million inhabitants while the rest of emerging countries have 56.48 million.

analysis performed for the total number of transactions, the median difference is statistically significant between BRICS and emerging countries. Additionally, the probability that the *CrossVolume* (cross-border volume to GDP) is higher for BRICS countries is 62.5% and the likelihood that the number of cross-border transactions to population is higher in these countries is 26.8%.

Table 8: Non-parametric test for difference in medians

Two-sample Wilcoxon rank-sum test is performed. The difference in medians for BRICS and emerging countries is calculated. The variables analyzed are the number of deals per country per year, the Volume (calculated as the percentage of deal value over GDP) and the number of deals to population (in millions). The test is performed for the total amount of transactions (Panel A) and for cross-border ones (Panel B)

	Z	P-value	P (BRICS=1) > (BRICS=0)
Panel A: Total M&A transactions			
Ho: #deals (BRICS=1) = #deals (BRICS=0)	11.105	0.000	0.880
Ho: Volume (BRICS=1) =Volume (BRICS=0)	5.017	0.000	0.672
Ho: #deals to population (BRICS=1) =#deals to population (BRICS=0)	-4.141	0.000	0.358
Panel B: Cross-border M&A transactions			
Ho: # Cross-border deals (BRICS=1) = # Cross-border deals (BRICS=0)	9.147	0.000	0.824
Ho: Volume (BRICS=1) =Volume (BRICS=0)	3.099	0.0199	0.615
Ho: # Cross- border deals to population (BRICS=1) = #cross-border deals to population (BRICS=0)	-6.265	0.000	0.268

The evidence presented until now, partially supports the first hypothesis, which states that the M&A activity, as a whole, along with cross-border transactions, are larger in BRICS countries, compared to the rest of the emerging countries. In quantity, BRICS countries have on average more activity than emerging countries. Likewise, when the *Volume* (Volume to GDP) measure is considered, BRICS have a higher level of M&A activity, however, this pattern is not statistically significant once cross-border transactions (*CrossVolume*) are analyzed. This might signal that the size of the deals in BRICS is larger. In addition, when examining the ratio of the number of deals over population (*# Deals to Population*), the outcomes suggest that it is higher for emerging countries for both, the total number of transactions and cross-border ones.

4.2   Macro-economic determinants of M&As

Different specifications are run using a panel data approach to estimate the importance of the macro-economic determinants of M&As. The results for the total volume of M&A activity *(Volume)* and cross-border activity *(CrossVolume)* are reported in tables 9 and 10 respectively.

According to the results exhibited in table 9, the *BRICS* variable (dummy variable, which is equal to 1 if the country is classified as BRICS and zero otherwise) seems to have a positive effect on the volume of M&A activity, but the results are not significant. In model 2 some macro-economic variables are included. It is shown that higher *Inflation Rate* has a small but positive and significant impact on the *Volume* activity. In column 3, all the selected macro-economic variables are incorporated. The results suggest that a higher level of *Lending Interest Rate* increases the *Volume* activity. These outcomes are unexpected, as previous studies have found that *Interest Rate* and I*nflation Rate* have a negative impact on M&A activity (Hardford, 2005; Pablo, 2009; Yang et al., 2000; Cortés et al.,2012).

In columns 4 and 5 the interaction variables for BRICS are added to the specifications, the difference between these two models is the inclusion of fixed effects in the latter one. In model 4, where the effect of the different variables across countries are analyzed, *GDP growth* has a positive and significant impact. However, an increase in *GDP growth in BRICS* countries has a negative and significant impact on the volume activity. These results are in line with previous findings, some authors state that GDP growth can incentivize M&A activity as they are a quick instrument to obtain market share (Wang, 2008; Boateng et al., 2014). Still, GDP growth might have a negative impact on this activity as it could encourage the establishment of new businesses (greenfield investments) (Globerman, 2005; Neto et al., 2009). The *Lending Interest Rate* has a positive and significant impact on M&A activity. A possible explanation is that a gradual increase in interest rates in a strong economy (country with a healthy economic growth) is likely to increase corporate confidence, what will ultimately increase the deal activity (Denise Gan, 2017). Additionally, the *Depreciation in BRICS* countries has a negative and significant impact on M&A activity. This result could signal that the reduction in profits repatriation may outweigh the benefits of transaction costs and financing reductions due to currency depreciation. This outcome is consistent with the findings of Pablo (2009), who states that the currency depreciation (in the target country) lessens the likelihood of cross-border deals.

When fixed effects are included in the regression (column 5) and the pure effects of the variables within each country are analyzed, some results are different. The *GDP growth* is not significant, supporting the idea that greenfield investments are preferred to M&A transactions. Consistent with previous findings, the *Lending Interest Rate* has a negative and significant effect, as expected since it is considered a proxy of transaction costs and funding. However, the *Lending Interest Rate in BRICS* has a positive and significant impact, as mentioned above, this can be interpreted as an increase in corporate confidence. The *Depreciation in BRICS* countries has still a negative and significant effect.

In this specification, consistent with previous findings, the *Openness* variable turns out to be positive and significant (Globerman et al., 2005 and Neto et al., 2009), nevertheless the *Openness in BRICS* countries has a negative and significant effect on M&A activity, this outcome is consistent with earlier research, suggesting that M&A activity is a way of avoiding trade barriers (Yang et al., 2000).

Table 9: Macro-economic determinants of M&A activity. 2000-2017

The dependent variable is the Volume measure calculated as the percentage of transactions value to GDP. The dependent variable is regressed using different macro-economic variables, controlling for GDP and broad money. T-stats based on robust standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

| VARIABLES | DEPENDENT VARIABLE: VOLUME | | | | |
	(1)	(2)	(3)	(4)	(5)
BRICS	0.041	0.035	0.019	0.141	
	(1.072)	(0.882)	(0.653)	(1.390)	
GDP Growth		0.002	0.003	0.006*	0.005
		(0.970)	(0.983)	(1.837)	(1.157)
GDP Growth x BRICS				-0.010*	0.003
				(-1.755)	(0.436)
Inflation		0.001*	-0.000	-0.000	0.001
		(1.769)	(-0.111)	(-0.040)	(0.863)
Inflation x BRICS				-0.006	-0.001
				(-1.528)	(-0.319)
Lending interest rate			0.005***	0.005*	-0.002**
			(5.883)	(1.909)	(-2.341)
Lending interest rate x BRICS				-0.001	0.002*
				(-0.314)	(1.859)
Depreciation			0.000	0.001	0.001
			(0.417)	(0.906)	(1.567)
Depreciation x BRICS				-0.001*	-0.001**
				(-1.847)	(-2.442)
Openness		-0.000	-0.000	0.000	0.001*
		(-0.598)	(-0.152)	(0.078)	(2.020)
Openness x BRICS				-0.000	-0.004**
				(-0.309)	(-2.357)
Ln (GDP)	-0.008	-0.011	-0.026	-0.021	0.093
	(-0.498)	(-0.688)	(-1.318)	(-1.022)	(1.583)
Broad Money	0.000	0.001	0.001	0.001	0.002
	(0.804)	(1.073)	(1.440)	(1.159)	(1.299)
Constant	0.248	0.324	0.632	0.468	-2.518
	(0.604)	(0.756)	(1.214)	(0.888)	(-1.665)
Observations	398	390	325	325	325
R-squared	0.0987	0.104	0.0784	0.0903	0.143
Number of Countries	24	24	21	21	21
Country FE	NO	NO	NO	NO	YES
Year FE	YES	YES	YES	YES	YES

In table 10 the same regressions are exhibited but using *CrossVolume* (cross-border volume) as the dependent variable. In general, the results are in line with the ones presented in table 9. *GDP growth* and *Inflation Rate* have a positive impact on cross-border activity. The *Lending Interest Rate* is

positive and significant for all the specifications, except for the one which includes fixed effects, where its effect is negative and significant. The *Openness* variable has a positive and significant impact. Moreover, the *Depreciation in BRICS* is negative and significant.

Table 10: Macro-economic determinants of cross-border M&A activity.2000-2017

The dependent variable is the CrossVolume measure calculated as the percentage of transactions value to GDP, including only those deals where the acquirer and the target company are from different countries. The dependent variable is regressed using different macro-economic variables, controlling for GDP and broad money. T-stats based on robust standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

	DEPENDENT VARIABLE: CROSSVOLUME				
VARIABLES	(1)	(2)	(3)	(4)	(5)
BRICS	0.020	0.011	-0.004	0.062	
	(0.932)	(0.547)	(-0.196)	(1.241)	
GDP Growth		-0.000	0.002	0.005*	0.003
		(-0.145)	(0.808)	(1.662)	(0.724)
GDP Growth x BRICS				-0.008	-0.002
				(-1.488)	(-0.331)
Inflation		0.002***	0.001	0.001	0.001
		(3.773)	(1.594)	(0.739)	(1.272)
Inflation x BRICS				-0.001	0.000
				(-0.444)	(0.105)
Lending interest rate			0.003***	0.003*	-0.002*
			(4.952)	(1.803)	(-1.849)
Lending interest rate x BRICS				-0.001	0.002
				(-0.489)	(1.620)
Depreciation			-0.000	0.000	0.001
			(-0.022)	(0.763)	(1.585)
Depreciation x BRICS				-0.001*	-0.001**
				(-1.900)	(-2.645)
Openness		-0.000	-0.000	-0.000	0.001**
		(-1.315)	(-0.739)	(-0.568)	(2.267)
Openness x BRICS				-0.000	-0.002
				(-0.117)	(-1.323)
Ln (GDP)	-0.012	-0.022	-0.025*	-0.021	0.028
	(-1.063)	(-1.612)	(-1.652)	(-1.345)	(0.494)
Broad Money	0.000	0.000	0.001	0.000	0.001
	(0.097)	(0.971)	(1.262)	(1.091)	(1.090)
Constant	0.361	0.638*	0.651	0.524	-0.804
	(1.246)	(1.755)	(1.623)	(1.279)	(-0.555)
Observations	347	339	285	285	285
R-squared	0.0799	0.0818	0.0785	0.0842	0.112
Number of Countries	24	24	21	21	21
Country FE	NO	NO	NO	NO	YES
Year FE	YES	YES	YES	YES	YES

The evidence presented in this section partially supports the second hypothesis which states that the total volume of M&A activity (*Volume)* and cross-border transactions *(CrossVolume)* are influenced by macro-economic factors and that they play a different role in BRICS countries. The outcomes are consistent for the two volume measures selected (total and cross-border activity). Unexpected results

are found for *Inflation Rate* and *Lending Interest Rate*, as for some specifications, positive and significant coefficients are obtained. The *Depreciation* has a negative and significant impact only in BRICS countries. In addition, the impact of *Openness* in all the countries analyzed is different from the one in BRICS countries. Then, consistent with the neoclassical hypothesis, the macro-economic factors do have a (small) impact on M&A activity, and they have a different effect on the so-called BRICS countries.

Furthermore, in section 4.1 it is shown that the volume of M&A activity (*Volume)* is significantly higher in BRICS. According to the results presented in this section, *Lending Interest Rate, Depreciation* and *Openness* have a different impact on M&A activity in BRICS. Hence, they might contribute to explain why there is a difference in *Volume* between BRICS and emerging countries.

4.3   Business environment determinants of M&As

The third hypothesis is also tested following an unbalanced panel data approach. In this section the idea is to estimate the impact of the business environment in the total volume of transactions and in cross-border deals. The different effects for BRICS and emerging countries are studied. The outcomes are reported in tables 11 and 12.

In the results presented in column 1 and 2 of table 11, the impact on M&A volume activity (*Volume)* of the different business environment variables are analyzed. In the first specification, the variation across countries is exhibited. The outcomes of this regression show that there is a positive and significant relation between *Investment Freedom* and the level of M&A activity. This variable measures the level of regulatory restrictions imposed on capital investment flow and it is a proxy of the market's openness. Then, it is suggested that a better regulatory environment and the more open a country is, the higher the level of M&A activity.

When target-country fixed effects are incorporated in the regression (column 2) the *Investment Freedom* variable turns out to be insignificant. Furthermore, the *Property Rights* Index becomes positive and significant what signals that the better the legal framework concerning the employment of private property and the better it is respected, the higher the level of M&A activity.

Table 11: Business environment determinants of total M&A activity.2000-2017.

The dependent variable is the Volume measure, calculated as the percentage of transactions value to GDP. The dependent variable is regressed using different business environmental variables, controlling for GDP, GDP growth and broad money. T-stats based on robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

VARIABLES	DEPENDENT VARIABLE: VOLUME			
	(1)	(2)	(3)	(4)
BRICS	0.043		0.174	
	(1.018)		(0.521)	
Property Rights	0.001	0.002*	-0.000	0.002
	(0.831)	(1.811)	(-0.718)	(1.473)
Property Rights x BRICS			0.003	-0.001
			(1.102)	(-1.206)
Business Freedom	-0.002	-0.003	-0.002	-0.003
	(-0.745)	(-0.832)	(-0.567)	(-0.826)
Business Freedom x BRICS			0.003	0.005
			(0.763)	(1.433)
Investment Freedom	0.001**	0.001	0.001	0.000
	(2.069)	(1.524)	(1.545)	(0.454)
Investment Freedom x BRICS			0.000	-0.002
			(0.238)	(-0.907)
Tax Burden	0.001	0.003	0.002	0.005
	(0.600)	(0.620)	(1.356)	(1.461)
Tax Burden x BRICS			-0.006***	-0.012***
			(-3.090)	(-4.443)
GDP growth	0.001	0.004	0.001	0.003
	(0.538)	(1.080)	(0.239)	(0.904)
Ln (GDP)	0.003	0.033	0.016	0.082
	(0.187)	(0.545)	(0.686)	(1.280)
Broad Money	0.000	0.002	0.000	0.002
	(0.684)	(1.244)	(0.436)	(0.928)
Constant	-0.141	-1.083	-0.512	-2.398
	(-0.333)	(-0.747)	(-0.844)	(-1.482)
Observations	398	398	398	398
R-squared	0.124	0.141	0.124	0.167
Number of Countries	24	24	24	24
Country FE	NO	YES	NO	YES
Year FE	YES	YES	YES	YES

Finally, the last two specifications include all the variables and the interaction terms. While model 3 does not include fixed effects, model 4 does. In both models, the only variable with significant results is the *Tax Burden in BRICS* countries, which, as expected, has a negative impact on M&A activity, suggesting that a higher government size or a higher level of taxation provides a disincentive to this activity and has a crowding out effect.

In table 12, the outcomes for *CrossVolume* (cross-border volume) of M&A activity are displayed. Only the last two specifications have significant results. Consistent with the findings for the total

volume of this activity, *Tax Burden in BRICS* has a negative impact. However, unexpectedly in model 3, the *Property Rights* Index turns out to have a negative and significant effect.

Table 12: Business environment determinants of cross-border volume M&A activity.2000-2017.

The dependent variable is the CrossVolume measure calculated as the percentage of transactions value to GDP, including only those deals where the acquirer and the target company are from different countries. The dependent variable is regressed using different business environmental variables, controlling for GDP, GDP growth and broad money. T-stats based on robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

VARIABLES	DEPENDENT VARIABLE: CROSSVOLUME			
	(1)	(2)	(3)	(4)
BRICS	0.024		-0.032	
	(1.036)		(-0.115)	
Property Rights	-0.001	0.001	-0.001*	0.001
	(-1.544)	(1.526)	(-1.807)	(1.134)
Property Rights x BRICS			0.003	0.001
			(1.312)	(0.452)
Business Freedom	-0.001	-0.003	-0.001	-0.004
	(-0.444)	(-0.921)	(-0.508)	(-0.900)
Business Freedom x BRICS			0.002	0.005
			(0.532)	(1.063)
Investment Freedom	0.001	0.001	0.001	0.001
	(1.328)	(0.873)	(1.245)	(0.579)
Investment Freedom x BRICS			0.000	-0.001
			(0.060)	(-0.816)
Tax Burden	0.002	0.005	0.002	0.006
	(0.952)	(1.040)	(1.126)	(1.284)
Tax Burden x BRICS			-0.003*	-0.007**
			(-1.716)	(-2.200)
GDP growth	-0.002	0.001	-0.001	0.001
	(-0.765)	(0.457)	(-0.181)	(0.342)
Ln (GDP)	-0.008	-0.032	0.005	0.008
	(-0.717)	(-0.476)	(0.300)	(0.127)
Broad Money	0.000	0.002	0.000	0.002
	(0.502)	(1.097)	(0.685)	(0.942)
Constant	0.179	0.560	-0.185	-0.488
	(0.616)	(0.344)	(-0.419)	(-0.330)
Observations	347	347	347	347
R-squared	0.0935	0.138	0.107	0.149
Number of Countries	24	24	24	24
Country FE	NO	YES	NO	YES
Year FE	YES	YES	YES	YES

To sum up, the evidence exhibited in this section shows little support for the third hypothesis which states that the volume of M&A activity (*Volume*) and cross-border transactions (*CrossVolume*) are determined by the strength of institutional factors and the business environment, measured by the Economic Freedom Index. Additionally, it states that these variables have a specific effect in BRICS. The findings suggest that the *Property Rights* and *Investment Freedom* indices have a small but

positive impact on M&A activity. At the same time, the higher the level of taxation in BRICS the lower the level of this activity. Earlier in section 4.1, it is exhibited that the Volume of M&A activity in BRICS countries is higher than in emerging countries. Nevertheless, if the evidence presented here does not explain this difference, then, other variables which are not under study might be able to do it.

5   Robustness checks

In this section, four robustness checks are performed. First, the regressions are run shortening the time frame from 2006 until 2017. This period is selected because in 2006 the so-called BRICS countries had their first meeting and started a mutual collaboration process. Second, the analysis is performed winsorizing the data at 1% to deal with outliers. Next, the regressions are run using a Tobit model, following the approach used by Rossi and Volpin (2004). Finally, the last check that is performed, consists of the calculation of total volume as percentage of traded firms that are targets of successful transactions. This last check is not performed for cross-border acquisitions.

The outcomes of the first robustness check are, in general, in line with the ones performed in the previous section, the significance of the variables changes but the negative (positive) effect of the variables remain. Regarding macro-economic variables, *GDP growth* has a positive and significant impact in all the specifications. Additionally, while *Lending Interest Rate* and *Openness* have a positive effect on M&A activity, *Inflation Rate* (as expected) and *Depreciation in BRICS* countries have a negative impact. Concerning business environment variables, the *Property Rights* index and *Business Freedom in BRICS* countries turn out insignificant. Nevertheless, the former one for BRICS (*Property Rights in BRICS*) has a positive and significant impact. Moreover, the rest of the determinants analyzed are consistent with previous findings, *Tax Burden in BRICS* countries has a negative and significant effect. An important and unexpected result for cross-border activity (*CrossVolume*) is that, as in the original regression, *Property Rights* Index has a negative and significant impact. The results are exhibited in the appendix (tables 16-19).

After winsorizing the data for the dependent variable, it can be concluded that most of the outcomes are consistent with the findings displayed in sections 4.2 and 4.3. One of the differences in the results is that, *Inflation in BRICS* counties, for the total volume of activity (*Volume*), has a negative and significant impact. Regarding the business environment variables, the *Property Right* Index turns out insignificant. In addition, concerning the differences in results for cross-border activity (*CrossVolume)*, whereas, *GDP growth* becomes insignificant, the *GDP growth in BRICS* turns out

negative and significant. In addition, *Lending Interest Rate in BRICS, Depreciation* and *Openness* become positive and significant, at the same time, *Depreciation in BRICS* has a negative and significant effect. The outcomes are presented in the appendix (tables 20-23).

The third robustness check performed consists in running the regressions using a Tobit model, following the approach used by Rossi & Volpin (2004). The usage of these model is motivated by the fact that the dependent variables is bounded, between 0 and 100 by construction, it is a censored regression model. Regarding the impact on the specifications for macro-economic variables, most of the significant coefficients turn out insignificant. On the contrary, concerning the business environment variables, some of them result to be significant. In particular, *Business Freedom* and *Tax Burden in BRICS* have a negative and significant impact on M&A activity, at the same time, *Tax Burden* has a positive effect. Previous researches found a negative relation between the Business Freedom Index and the M&A activity, suggesting that greater facility to establish new businesses encourages greenfield investments detrimental to M&A activity. Then, the positive relation between this index and M&A for BRICS countries might be in line with the idea of using M&A as a fast way to increase market share, and that the better the regulatory environment the larger the volume of M&A. In addition, the tax benefits that can be gain from M&A activity, might be a possible reason why higher taxes have a positive impact on it. The evidence is displayed in the appendix (tables 24-27).

Finally, some of the results of the last robustness check, which calculates a new measure of volume (percentage of traded firms that are targets of successful transaction) differ from the outcomes in the previous section. One possible explanation is that many observations are dropped as the percentage of deals in which public companies are involved is not only low, but also in many years there are no public companies involved in these transactions for several countries. Concerning macro-economic determinants, the main differences are that *Lending Interest Rate* and *Depreciation* have a negative and significant impact on the volume of M&A. Nevertheless, *Depreciation in BRICS* has a positive and significant effect. The *Openness* variables *(Openness* and the interactive term) have a negative and significant impact. Furthermore, regarding business environmental variables, while, *Business Freedom* turns out to be positive and significant, for BRICS it has a negative and significant effect. The results are shown in the appendix (tables 28 and 29).

6 Limitations

This study has some limitations. Firstly, there are some issues related to the databases and the gathering of macro-economic variables. For example, there is no information regarding the *Lending Interest Rate* for some countries (Saudi Arabia, Taiwan, Turkey and UEA) and no data for the *Openness* measure in Taiwan. Additionally, some countries, like Argentina, have problems when reporting the *Inflation Rate*.

Secondly, although the use of panel data reduces the omitted variable bias, compared to cross sectional data, the time varying omitted variables are still present. Additionally, in this investigation, no industry or company-level control variables are included, as the amount of public transactions is low, compared to the total size of the sample.

7 Conclusion

This investigation aims to contribute to the field research of determinants of M&A activity in emerging countries by (1) studying if there is a difference in the volume activity between the so-called BRICS and a selection of countries, classified as emerging, (2) studying the effect of macro-economic and business environmental variables in the total volume *(Volume)* and cross-border (*CrossVolume*) M&A activity, and (3) test, by interaction terms, if these environmental variables (macro-economic and business factors) have a specific effect in BRICS countries.

Using a sample of deals in 26 countries, announced between 2000 and 2017, completed by the end of 2018. The evidence provides, at least, partial support for the hypotheses presented in this research. The results show that for the total amount of deals, the *Volume* (volume to GDP) measure is higher in BRICS countries. Furthermore, the *Volume* and *CrossVolume* (cross-border) M&A activity are affected by some macro-economic factors agreeing with the neoclassical hypothesis. Nevertheless, the results are mostly not significant for business environment variables. The outcomes for both volume measures are consistent.

Regarding the macro-economic factors, some unexpected outcomes are obtained, as the *Inflation Rate* and the *Lending Interest Rate* have a positive and significant impact on M&A activity. Additionally, *GDP growth* has a positive and significant effect, suggesting that this activity is a way to increase market share. Moreover, regarding the specific effect for these variables in BRICS, the main findings are that *Depreciation* and *Openness* (the interaction terms) have a negative and significant impact.

Furthermore, *GDP growth in BRICS* has a negative and significant impact, suggesting that in these countries an economic growth leads to greenfield investments. Therefore, these outcomes suggest that some macro-economic factors influence the difference in volume of M&A activity between BRICS and the rest of emerging countries.

In addition, concerning the business environment variables, the main results are that *Property Rights* and *Investment Freedom* indices have a small but positive impact on M&A activity. For the so-called BRICS, a higher level of *Tax Burden* has a negative impact on M&A activity. Most of this evidence is consistent with the one found for cross-border activity. Therefore, little support is found to support the idea that M&A activity is influenced by business environmental variables, measured through the Economic Freedom Index.

Hence, in this research, the evidence shows that the *Volume* of M&A activity between BRICS and emerging countries is not only different, but also that *Volume* (measures as volume to GDP) in BRICS is higher. However, in the attempt to explain the determinants of this difference and of M&A activity itself, some support is found for macro-economic variables and little support is found for business environmental ones. Regarding the macro-economic factors, small but significant results are obtained. Moreover, the effect of some of these variables in BRICS is different. Concerning business environmental factors, few significant outcomes are found. Therefore, the difference in *Volume* must be due to some variables that are not under study in this paper.

The research in this field is far from over. Future studies can control for industry or company specific characteristics. Additionally, this paper does not control for characteristics of the M&A deals, or the strategy of integration (horizontal, vertical or diversification). Furthermore, an analysis of the difference in abnormal returns for BRICS and other countries can be performed using and event study methodology.

8 Appedix

8.1 Variable definition

Table 13: Variable definition

Variable	Definition	Source
Dependent variables		
Volume	Sum of the value of transactions in local currency, divided by the nominal GDP, also in local currency	Thomson One
CrossVolume	Sum of the value of cross-border transactions in local currency, divided by the nominal GDP, also in local currency	Thomson One
Independent variables		
BRICS	Dummy variable that takes the value of one if the country is Brazil, Russia, India, China or South Africa	
GDP growth	The rate at which a nation's GDP changes from one year to another.	World Bank
Inflation Rate	The inflation rate is calculated as the percentage annual change in CPI	World bank
Lending Interest Rate	It is the bank rate that usually meets the short- and medium-term financing needs of the private sector.	World Bank
Depreciation	This variable is calculated as the percentage difference of the currency exchange rate between two years. A positive number corresponds to a currency depreciation.	Datastream
Openness	This index is given by the sum of exports and imports as a share of GDP.	World Bank
Property Rights	Index that proxies the Rule of Law pillar. It measures the legal framework regarding private property.	Heritage Foundation. Economic Freedom Index
Tax Burden	Index that proxies the Government Size. It reflects the marginal tax rate on corporate and personal revenue, as well as the general level of taxation as a percentage of gross domestic product.	Heritage Foundation. Economic Freedom Index
Business Freedom	Index that proxies the Regulatory Efficiency pillar. It measures the degree to which the regulatory and infrastructure environments limit the efficiency in business operations.	Heritage Foundation. Economic Freedom Index
Investment Freedom	Index that proxies the Openness Market pillar. It measures the regulatory restrictions imposed on the flow of investment capital.	Heritage Foundation. Economic Freedom Index

8.2 Correlations

Table 14: Correlations macro-economic variables

Variables	(1)	(2)	(3)	(4)	(5)
(1) GDP growth	1.000				
(2) Inflation rate	-0.130*	1.000			
(3) Lending interest rate	-0.217*	0.340*	1.000		
(4) Depreciation	-0.321*	0.631*	0.228*	1.000	
(5) Openness	-0.022	-0.232*	-0.453*	-0.094*	1.000

* shows significance at the 0.1 level

Table 15: Correlations business-environment variables

Variables	(1)	(2)	(3)	(4)	(5)
(1) Property rights	1.000				
(2) Government integrity	0.769*	1.000			
(3) Business freedom	0.530*	0.495*	1.000		
(4) Investment freedom	0.487*	0.248*	0.328*	1.000	
(5) Tax burden	0.170*	0.285*	0.240*	-0.189*	1.000

* shows significance at the 0.1 level

Due to the high correlation between Property rights and Government integrity and the fact that they both are part of the Rule of Law pillar in the Economic Freedom Index, the latter one is excluded from the regressions.

8.3 Robustness checks

Time frame 2006-2017

Table 16: Macro-economic determinants of M&A activity. 2006-2017

The dependent variable is the Volume measure, calculated as the percentage of transactions value to GDP. The dependent variable is regressed using different macro-economic variables, controlling for GDP and broad money. The period analyzed is 2006-2017. T-stats based on robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

| VARIABLES | DEPENDENT VARIABLE: VOLUME | | | | |
	(1)	(2)	(3)	(4)	(5)
BRICS	0.050	0.048	0.026	0.226*	
	(1.128)	(1.015)	(0.764)	(1.697)	
GDP Growth		0.004*	0.007*	0.009**	0.008*
		(1.659)	(1.887)	(2.169)	(2.032)
GDP Growth x BRICS				-0.006	0.008
				(-0.699)	(0.872)
Inflation		-0.003	-0.003**	-0.002	-0.003
		(-1.606)	(-2.519)	(-1.196)	(-0.610)
Inflation x BRICS				-0.006	-0.006
				(-1.123)	(-1.073)
Lending interest rate			0.007***	0.005	-0.001
			(5.912)	(1.196)	(-0.314)
Lending interest rate x BRICS				0.000	0.006
				(0.115)	(0.934)
Depreciation			-0.000	0.001	0.000
			(-0.142)	(0.920)	(0.728)
Depreciation x BRICS				-0.001*	-0.001
				(-1.857)	(-1.522)
Openness		-0.000	0.000	0.000	0.002**
		(-1.017)	(0.217)	(0.180)	(2.497)
Openness x BRICS				-0.002	-0.001
				(-1.177)	(-0.343)
Ln (GDP)	-0.014	-0.024	-0.027	-0.031	0.094
	(-0.688)	(-0.955)	(-1.050)	(-1.214)	(0.535)
Broad Money	0.001	0.001	0.001	0.001	0.005
	(0.848)	(0.993)	(1.080)	(0.861)	(1.643)
Constant	0.423	0.677	0.644	0.760	-2.988
	(0.787)	(1.046)	(0.954)	(1.181)	(-0.651)
Observations	272	270	220	220	220
R-squared	0.103	0.122	0.105	0.118	0.195
Number of Countries	24	24	21	21	21
Country FE	NO	NO	NO	NO	YES
Year FE	YES	YES	YES	YES	YES

Table 17: Macro-economic determinants of cross-border M&A activity.2006-2017

The dependent variable is the CrossVolume measure, calculated as the percentage of transactions value to GDP, including only those deals where the acquirer and the target company are from different countries. The dependent variable is regressed using different macro-economic variables, controlling for GDP and broad money. The period analyzed is 2006-2017. T-stats based on robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

VARIABLES	DEPENDENT VARIABLE: CROSSVOLUME				
	(1)	**(2)**	**(3)**	**(4)**	**(5)**
BRICS	0.024	0.015	0.002	0.126	
	(0.994)	(0.549)	(0.093)	(1.086)	
GDP Growth		0.003	0.005*	0.009***	0.003
		(1.275)	(1.903)	(2.993)	(0.902)
GDP Growth x BRICS				-0.013	0.002
				(-1.522)	(0.257)
Inflation		0.000	0.000	0.001	-0.004
		(0.110)	(0.027)	(0.472)	(-0.824)
Inflation x BRICS				-0.004	-0.003
				(-1.032)	(-0.637)
Lending interest rate			0.004***	0.003	-0.000
			(4.485)	(0.902)	(-0.114)
Lending interest rate x BRICS				-0.000	0.001
				(-0.078)	(0.110)
Depreciation			-0.000	0.001	0.001
			(-0.092)	(0.952)	(0.818)
Depreciation x BRICS				-0.001	-0.002
				(-1.628)	(-1.681)
Openness		-0.000	-0.000	-0.000	0.003**
		(-1.062)	(-0.316)	(-0.269)	(2.558)
Openness x BRICS				-0.001	0.002
				(-0.433)	(0.578)
Ln (GDP)	-0.015	-0.025	-0.029	-0.026	0.088
	(-1.151)	(-1.468)	(-1.441)	(-1.268)	(0.569)
Broad Money	0.000	0.000	0.000	0.000	0.005
	(0.357)	(0.709)	(0.901)	(0.782)	(1.370)
Constant	0.469	0.748	0.767	0.680	-2.849
	(1.359)	(1.613)	(1.431)	(1.235)	(-0.696)
Observations	233	231	190	190	190
R-squared	0.0824	0.0855	0.0809	0.0872	0.167
Number of Countries	24	24	20	20	20
Country FE	NO	NO	NO	NO	YES
Year FE	YES	YES	YES	YES	YES

Table 18: Business environment determinants of total M&A activity.2006-2017.

The dependent variable is the Volume measure, calculated as the percentage of transactions value to GDP. The dependent variable is regressed using different business environmental variables, controlling for GDP, GDP growth and broad money. The period analyzed is 2006-2017. T-stats based on robust standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

VARIABLES	DEPENDENT VARIABLE: VOLUME			
	(1)	(2)	(3)	(4)
BRICS	0.044		0.252	
	(0.677)		(0.345)	
Property Rights	0.000	-0.000	-0.000	-0.001
	(0.041)	(-0.155)	(-0.497)	(-0.354)
Property Rights x BRICS			0.006*	-0.001
			(1.793)	(-0.276)
Business Freedom	-0.004	-0.009	-0.007	-0.012
	(-0.898)	(-1.162)	(-1.029)	(-1.182)
Business Freedom x BRICS			0.009	0.010
			(1.225)	(1.123)
Investment Freedom	0.002	0.001	0.003*	0.002
	(1.584)	(1.217)	(1.673)	(1.145)
Investment Freedom x BRICS			-0.001	-0.007
			(-0.293)	(-1.191)
Tax Burden	0.004	0.011	0.007	0.017
	(0.887)	(1.138)	(1.320)	(1.497)
Tax Burden x BRICS			-0.014**	-0.025**
			(-2.311)	(-2.216)
GDP growth	0.004	0.010**	0.005*	0.009**
	(1.353)	(2.466)	(1.685)	(2.343)
Ln (GDP)	0.002	0.025	0.046	0.057
	(0.078)	(0.259)	(1.035)	(0.484)
Broad Money	0.001	0.006*	0.001	0.005*
	(0.962)	(2.018)	(0.933)	(1.993)
Constant	-0.215	-1.334	-1.482	-2.061
	(-0.317)	(-0.570)	(-1.152)	(-0.669)
Observations	272	272	272	272
R-squared	0.174	0.244	0.209	0.286
Number of Countries	24	24	24	24
Country FE	NO	YES	NO	YES
Year FE	YES	YES	YES	YES

Table 19: Business environment determinants of cross-border volume M&A activity.2006-2017.

The dependent variable is the CrossVolume measure, calculated as the percentage of transactions value to GDP, including only those deals where the acquirer and the target company are from different countries. The dependent variable is regressed using different business environmental variables, controlling for GDP, GDP growth and broad money. The period analyzed is 2006-2017. T-stats based on robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

VARIABLES	DEPENDENT VARIABLE: CROSSVOLUME			
	(1)	(2)	(3)	(4)
BRICS	0.031		-0.015	
	(0.730)		(-0.033)	
Property Rights	-0.001	-0.001	-0.002**	-0.003
	(-0.761)	(-0.607)	(-2.100)	(-1.134)
Property Rights x BRICS			0.006*	0.002
			(1.694)	(1.138)
Business Freedom	-0.003	-0.011	-0.003	-0.015
	(-0.769)	(-1.173)	(-0.738)	(-1.193)
Business Freedom x BRICS			0.005	0.014
			(0.930)	(1.088)
Investment Freedom	0.002	0.002	0.003	0.003
	(1.346)	(1.177)	(1.349)	(1.442)
Investment Freedom x BRICS			0.000	-0.006
			(0.145)	(-1.472)
Tax Burden	0.003	0.013	0.005	0.018
	(0.994)	(1.254)	(1.233)	(1.465)
Tax Burden x BRICS			-0.008*	-0.021*
			(-1.884)	(-1.749)
GDP growth	0.003	0.008**	0.005*	0.008*
	(1.176)	(2.091)	(1.835)	(1.754)
Ln (GDP)	-0.007	-0.072	0.018	-0.017
	(-0.446)	(-0.680)	(0.583)	(-0.130)
Broad Money	0.000	0.005	0.001	0.005
	(0.679)	(1.698)	(0.928)	(1.680)
Constant	0.063	1.302	-0.702	-0.088
	(0.122)	(0.496)	(-0.733)	(-0.026)
Observations	233	233	233	233
R-squared	0.144	0.252	0.150	0.295
Number of Countries	24	24	24	24
Country FE	NO	YES	NO	YES
Year FE	YES	YES	YES	YES

Winsorizing

Table 20: Macro-economic determinants of M&A activity. 2000-2017. Winsorized

The dependent variable is the Volume measure, calculated as the percentage of transactions value to GDP. The dependent variable is regressed using different macro-economic variables, controlling for GDP and broad money. The dependent variable is winsorized to exclude 1% of outliers. T-stats based on robust standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

| VARIABLES | DEPENDENT VARIABLE: VOLUME WINSORIZED | | | | |
	(1)	(2)	(3)	(4)	(5)
BRICS	0.022	0.015	0.025	0.115	
	(0.535)	(0.335)	(0.881)	(1.133)	
GDP Growth		0.002	0.003	0.005*	0.002
		(0.970)	(1.192)	(1.767)	(0.998)
GDP Growth x BRICS				-0.007	0.006
				(-1.608)	(1.335)
Inflation		0.001	-0.000	-0.001	0.001
		(1.197)	(-0.516)	(-0.920)	(0.728)
Inflation x BRICS				-0.006*	-0.001
				(-1.773)	(-0.359)
Lending interest rate			0.003***	0.005*	-0.003***
			(3.165)	(1.763)	(-3.292)
Lending interest rate x BRICS				-0.001	0.002**
				(-0.229)	(2.520)
Depreciation			0.000	0.001*	0.001
			(0.722)	(1.749)	(1.665)
Depreciation x BRICS				-0.002***	-0.002**
				(-2.731)	(-2.482)
Openness		0.000	0.000	0.000	0.001**
		(0.029)	(0.201)	(0.551)	(2.411)
Openness x BRICS				-0.000	-0.003**
				(-0.051)	(-2.304)
Ln (GDP)	0.007	0.008	-0.012	-0.012	0.108**
	(0.553)	(0.664)	(-1.006)	(-0.858)	(2.728)
Broad Money	0.000	0.000	0.000	0.000	0.001
	(0.902)	(1.178)	(1.138)	(0.907)	(1.263)
Constant	-0.136	-0.180	0.285	0.257	-2.841**
	(-0.426)	(-0.604)	(0.920)	(0.677)	(-2.748)
Observations	398	390	325	325	325
R-squared	0.131	0.142	0.103	0.105	0.219
Number of Countries	24	24	21	21	21
Country FE	NO	NO	NO	NO	YES
Year FE	YES	YES	YES	YES	YES

Table 21: Macro-economic determinants of cross-border M&A activity.2000-2017.Winsorized.

The dependent variable is the CrossVolume measure, calculated as the percentage of transactions value to GDP, including only those deals where the acquirer and the target company are from different countries. The dependent variable is regressed using different macro-economic variables, controlling for GDP and broad money. The dependent variable is winsorized to exclude 1% outliers. T-stats based on robust standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

VARIABLES	DEPENDENT VARIABLE: CROSSVOLUME WINSORIZED				
	(1)	(2)	(3)	(4)	(5)
BRICS	0.018	0.018	0.007	0.039	
	(0.847)	(0.893)	(0.399)	(0.859)	
GDP Growth		-0.001	0.001	0.003	0.000
		(-0.567)	(0.620)	(1.634)	(0.186)
GDP Growth x BRICS				-0.005*	0.001
				(-1.697)	(0.420)
Inflation		0.001**	0.000	-0.000	0.001
		(2.548)	(0.590)	(-0.327)	(0.926)
Inflation x BRICS				-0.002	-0.001
				(-1.175)	(-0.428)
Lending interest rate			0.003***	0.003	-0.002**
			(4.888)	(1.585)	(-2.446)
Lending interest rate x BRICS				-0.000	0.002*
				(-0.205)	(1.938)
Depreciation			0.000	0.001*	0.001*
			(0.654)	(1.798)	(1.842)
Depreciation x BRICS				-0.002***	-0.001**
				(-3.041)	(-2.667)
Openness		-0.000	-0.000	0.000	0.000**
		(-0.902)	(-0.059)	(0.073)	(2.605)
Openness x BRICS				0.000	-0.001
				(0.456)	(-0.951)
Ln (GDP)	-0.007	-0.011	-0.014	-0.011	0.038
	(-0.783)	(-1.251)	(-1.626)	(-1.208)	(1.263)
Broad Money	0.000	0.000	0.000	0.000	0.000
	(0.519)	(0.291)	(0.983)	(0.693)	(1.144)
Constant	0.210	0.354	0.353	0.270	-0.994
	(0.983)	(1.499)	(1.589)	(1.104)	(-1.257)
Observations	347	339	285	285	285
R-squared	0.121	0.124	0.105	0.125	0.193
Number of Countries	24	24	21	21	21
Country FE	NO	NO	NO	NO	YES
Year FE	YES	YES	YES	YES	YES

Table 22: Business environment determinants of total M&A activity.2000-2017. Winsorized.

The dependent variable is the Volume measure, calculated as the percentage of transactions value to GDP. The dependent variable is regressed using different business environmental variables, controlling for GDP, GDP growth and broad money. The dependent variable is winsorized to exclude 1% of outliers. T-stats based on robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

| VARIABLES | DEPENDENT VARIABLE: VOLUME WINSORIZED | | | |
	(1)	(2)	(3)	(4)
BRICS	0.029		0.399	
	(0.702)		(1.571)	
Property Rights	0.001	0.001	0.000	0.001
	(1.424)	(1.631)	(0.574)	(1.585)
Property Rights x BRICS			0.001	-0.001
			(0.740)	(-1.455)
Business Freedom	-0.000	-0.000	-0.000	-0.000
	(-0.065)	(-0.038)	(-0.004)	(-0.155)
Business Freedom x BRICS			0.001	0.002**
			(0.883)	(2.271)
Investment Freedom	0.001*	0.001	0.001	0.001
	(1.647)	(1.709)	(1.420)	(1.306)
Investment Freedom x BRICS			-0.001	-0.002
			(-0.821)	(-1.569)
Tax Burden	-0.001	-0.001	0.000	0.001
	(-0.834)	(-0.676)	(0.705)	(1.332)
Tax Burden x BRICS			-0.006***	-0.008***
			(-3.953)	(-4.513)
GDP growth	0.002	0.002	0.001	0.002
	(0.691)	(0.864)	(0.348)	(0.687)
Ln (GDP)	0.013	0.064*	0.012	0.086*
	(0.785)	(1.760)	(0.663)	(1.889)
Broad Money	0.000	0.001	-0.000	0.001
	(0.671)	(1.460)	(-0.148)	(0.750)
Constant	-0.333	-1.715*	-0.371	-2.300*
	(-0.725)	(-1.818)	(-0.714)	(-1.899)
Observations	398	398	398	398
R-squared	0.156	0.167	0.163	0.197
Number of Countries	24	24	24	24
Country FE	NO	YES	NO	YES
Year FE	YES	YES	YES	YES

Table 23: Business environment determinants of cross-border volume M&A activity.2000-2017. Winsorized.

The dependent variable is the CrossVolume measure, calculated as the percentage of transactions value to GDP, including only those deals where the acquirer and the target company are from different countries. The dependent variable is regressed using different business environmental variables, controlling for GDP, GDP growth and broad money. The dependent variable is winsorized to exclude 1% outliers. T-stats based on robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

| VARIABLES | DEPENDENT VARIABLE: CROSSVOLUME WINSORIZED | | | |
	(1)	(2)	(5)	(6)
BRICS	0.027		0.110	
	(1.294)		(0.627)	
Property Rights	-0.000	0.001	-0.001	0.001
	(-1.114)	(1.347)	(-1.343)	(0.979)
Property Rights x BRICS			0.001	0.000
			(1.025)	(0.497)
Business Freedom	0.000	-0.000	0.001	-0.000
	(0.666)	(-0.416)	(0.679)	(-0.349)
Business Freedom x BRICS			-0.001	0.001
			(-0.437)	(0.739)
Investment Freedom	0.001	0.001	0.000	0.001
	(0.914)	(1.204)	(0.730)	(1.659)
Investment Freedom x BRICS			0.001	-0.002**
			(0.568)	(-2.082)
Tax Burden	-0.000	0.000	0.000	0.001
	(-0.285)	(0.204)	(0.230)	(1.411)
Tax Burden x BRICS			-0.002	-0.003**
			(-1.503)	(-2.284)
GDP growth	-0.001	-0.000	-0.001	-0.001
	(-0.733)	(-0.170)	(-0.554)	(-0.313)
Ln (GDP)	-0.004	0.005	-0.002	0.014
	(-0.439)	(0.191)	(-0.165)	(0.454)
Broad Money	-0.000	0.000	-0.000	0.000
	(-0.383)	(1.494)	(-0.194)	(0.786)
Constant	0.152	-0.189	0.063	-0.404
	(0.558)	(-0.276)	(0.202)	(-0.499)
Observations	347	347	347	347
R-squared	0.107	0.152	0.104	0.167
Number of Countries	24	24	24	24
Country FE	NO	YES	NO	YES
Year FE	YES	YES	YES	YES

Tobit regressions for M&A activity

Table 24: Macro-economic determinants of M&A activity. Tobit model. 2000-2017

The dependent variable is the Volume measure, calculated as the percentage of transactions value to GDP. The Tobit model is used. The dependent variable is regressed using different macro-economic variables, controlling for GDP and broad money. T-stats based on standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

	DEPENDENT VARIABLE: VOLUME				
VARIABLES	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
BRICS	0.041	0.037	0.022	0.168	
	(0.974)	(0.886)	(0.603)	(1.589)	
GDP Growth		0.002	0.004	0.006*	0.005
		(0.782)	(1.177)	(1.656)	(1.364)
GDP Growth x BRICS				-0.006	0.003
				(-0.977)	(0.363)
Inflation		0.001	-0.000	-0.000	0.001
		(1.190)	(-0.226)	(-0.160)	(0.458)
Inflation x BRICS				-0.003	-0.001
				(-0.594)	(-0.126)
Lending interest rate			0.004***	0.003	-0.002
			(3.297)	(1.215)	(-0.803)
Lending interest rate x BRICS				0.000	0.002
				(0.125)	(0.552)
Depreciation			0.000	0.001	0.001
			(0.329)	(0.902)	(0.999)
Depreciation x BRICS				-0.001	-0.001
				(-1.208)	(-1.219)
Openness		-0.000	-0.000	0.000	0.001
		(-0.488)	(-0.127)	(0.063)	(1.448)
Openness x BRICS				-0.002	-0.004
				(-0.913)	(-1.576)
Ln (GDP)	-0.008	-0.013	-0.022	-0.021	0.093
	(-0.437)	(-0.679)	(-1.381)	(-1.225)	(1.300)
Broad Money	0.000	0.001	0.001*	0.001	0.002**
	(1.114)	(1.289)	(1.889)	(1.483)	(2.036)
Constant	0.249	0.372	0.538	0.517	-2.393
	(0.527)	(0.741)	(1.262)	(1.111)	(-1.271)
Observations	398	390	325	325	325
Number of Countries	24	24	21	21	21
Country FE	NO	NO	NO	NO	YES
Year FE	YES	YES	YES	YES	YES

Table 25: Macro-economic determinants of Cross-border M&A activity. Tobit model. 2000-2017

The dependent variable is the CrossVolume measure calculated as the percentage of transactions value to GDP, including only those deals where the acquirer and the target company are from different countries. The Tobit model is used. The dependent variable is regressed using different macro-economic variables, controlling for GDP and broad money. T-stats based on standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

VARIABLES	DEPENDENT VARIABLE: CROSSVOLUME				
	(1)	(2)	(3)	(4)	(5)
BRICS	0.019	0.012	-0.004	0.064	
	(0.648)	(0.451)	(-0.157)	(0.639)	
GDP Growth		0.000	0.002	0.005	0.003
		(0.096)	(0.592)	(1.224)	(0.731)
GDP Growth x BRICS				-0.008	-0.002
				(-1.367)	(-0.259)
Inflation		0.001*	0.001	0.001	0.001
		(1.715)	(0.813)	(0.369)	(0.495)
Inflation x BRICS				-0.001	0.000
				(-0.197)	(0.041)
Lending interest rate			0.003***	0.003	-0.002
			(3.256)	(1.408)	(-0.590)
Lending interest rate x BRICS				-0.001	0.002
				(-0.312)	(0.514)
Depreciation			-0.000	0.000	0.001
			(-0.012)	(0.523)	(0.741)
Depreciation x BRICS				-0.001	-0.001
				(-0.925)	(-0.989)
Openness		-0.000	-0.000	-0.000	0.001
		(-1.151)	(-1.039)	(-0.718)	(1.182)
Openness x BRICS				-0.000	-0.002
				(-0.097)	(-0.718)
Ln (GDP)	-0.012	-0.020	-0.025**	-0.021	0.028
	(-0.933)	(-1.506)	(-2.317)	(-1.620)	(0.354)
Broad Money	0.000	0.000	0.001**	0.000*	0.001
	(0.437)	(1.114)	(1.984)	(1.724)	(1.479)
Constant	0.363	0.557	0.651**	0.520	-0.690
	(1.059)	(1.629)	(2.241)	(1.484)	(-0.334)
Observations	347	339	285	285	285
Number of Countries	24	24	21	21	21
Country FE	NO	NO	NO	NO	YES
Year FE	YES	YES	YES	YES	YES

Table 26: Business-environment determinants of M&A activity. Tobit model. 2000-2017

The dependent variable is the Volume measure, calculated as the percentage of transactions value to GDP. The Tobit model is used. The dependent variable is regressed using different business environmental variables, controlling for GDP, GDP growth and broad money. T-stats based on standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

VARIABLES	DEPENDENT VARIABLE: VOLUME			
	(1)	(2)	(3)	(4)
BRICS	0.042		0.391	
	(0.919)		(1.354)	
Property Rights	0.001	0.002*	0.000	0.002*
	(0.705)	(1.764)	(0.585)	(1.911)
Property Rights x BRICS			0.003	-0.001
			(0.958)	(-0.403)
Business Freedom	-0.002**	-0.003***	-0.003***	-0.003***
	(-2.132)	(-2.665)	(-2.608)	(-2.934)
Business Freedom x BRICS			0.004*	0.005*
			(1.875)	(1.881)
Investment Freedom	0.001*	0.001	0.002*	0.000
	(1.692)	(0.986)	(1.771)	(0.386)
Investment Freedom x BRICS			-0.002	-0.002
			(-0.782)	(-0.762)
Tax Burden	0.001	0.003*	0.003**	0.005***
	(1.268)	(1.799)	(2.397)	(3.211)
Tax Burden x BRICS			-0.009***	-0.012***
			(-2.886)	(-3.477)
GDP growth	0.001	0.004	0.001	0.003
	(0.597)	(1.553)	(0.590)	(1.307)
Ln (GDP)	0.003	0.033	0.024	0.082
	(0.164)	(0.555)	(1.131)	(1.345)
Broad Money	0.000	0.002***	0.000	0.002**
	(1.068)	(2.725)	(0.963)	(2.292)
Constant	-0.145	-0.896	-0.787	-2.350
	(-0.268)	(-0.576)	(-1.350)	(-1.447)
Observations	398	398	398	398
Number of Countries	24	24	24	24
Country FE	NO	YES	NO	YES
Year FE	YES	YES	YES	YES

Table 27: Business-environment determinants of Cross-border M&A activity. Tobit model. 2000-2017

The dependent variable is the CrossVolume measure, calculated as the percentage of transactions value to GDP, including only those deals where the acquirer and the target company are from different countries. The Tobit model is used. The dependent variable is regressed using different business environmental variables, controlling for GDP, GDP growth and broad money. T-stats based on standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

VARIABLES	DEPENDENT VARIABLE: CROSSVOLUME			
	(1)	(2)	(3)	(4)
BRICS	0.021		0.054	
	(0.649)		(0.204)	
Property Rights	-0.000	0.001	-0.000	0.001
	(-0.312)	(1.407)	(-0.633)	(1.294)
Property Rights x BRICS			0.004	0.001
			(1.514)	(0.164)
Business Freedom	-0.002**	-0.003***	-0.003**	-0.004***
	(-2.027)	(-3.297)	(-2.560)	(-3.482)
Business Freedom x BRICS			0.003	0.005
			(1.605)	(1.476)
Investment Freedom	0.001	0.001	0.002*	0.001
	(1.625)	(0.585)	(1.945)	(0.498)
Investment Freedom x BRICS			-0.001	-0.001
			(-0.651)	(-0.551)
Tax Burden	0.002**	0.005***	0.003**	0.006***
	(1.985)	(3.084)	(2.539)	(3.363)
Tax Burden x BRICS			-0.005*	-0.007*
			(-1.709)	(-1.940)
GDP growth	-0.001	0.001	-0.000	0.001
	(-0.441)	(0.558)	(-0.188)	(0.428)
Ln (GDP)	-0.004	-0.032	0.013	0.008
	(-0.268)	(-0.504)	(0.785)	(0.115)
Broad Money	0.000	0.002**	0.000	0.002**
	(0.819)	(2.505)	(1.301)	(2.365)
Constant	0.040	0.741	-0.443	-0.356
	(0.097)	(0.444)	(-0.965)	(-0.204)
Observations	347	347	347	347
Number of Countries	24	24	24	24
Country FE	NO	YES	NO	YES
Year FE	YES	YES	YES	YES

Public M&A activity

Table 28: Macro-economic determinants of Public M&A activity. 2000-2017

The dependent variable is the Public Volume measure, calculated as the percentage traded firms that are targets of successful transactions. The dependent variable is regressed using different macro-economic variables, controlling for GDP and broad money. T-stats based on robust standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

VARIABLES	DEPENDENT VARIABLE: PUBLIC VOLUME				
	(1)	(2)	(3)	(4)	(5)
BRICS	1.447	-2.332	1.210	8.840	
	(0.311)	(-0.581)	(0.211)	(0.789)	
GDP Growth		1.185***	0.535	0.440	-0.161
		(2.720)	(1.060)	(0.857)	(-0.354)
GDP Growth x BRICS				0.831	-0.612
				(1.049)	(-0.946)
Inflation		0.236	0.550*	1.012**	-0.008
		(1.157)	(1.778)	(2.258)	(-0.041)
Inflation x BRICS				0.126	0.021
				(0.176)	(0.053)
Lending interest rate			-0.122	-0.919*	-0.114
			(-0.816)	(-1.782)	(-0.212)
Lending interest rate x BRICS				0.689	0.236
				(1.299)	(0.543)
Depreciation			-0.227*	-0.345**	0.045
			(-1.896)	(-2.024)	(0.445)
Depreciation x BRICS				0.284*	-0.096
				(1.936)	(-0.850)
Openness		-0.169*	-0.201**	-0.237**	0.048
		(-1.705)	(-2.062)	(-2.167)	(0.415)
Openness x BRICS				-0.406**	-0.092
				(-1.984)	(-0.642)
Ln (GDP)	-6.677*	-10.093**	-11.761***	-14.268***	-6.883
	(-1.931)	(-2.405)	(-2.798)	(-3.157)	(-1.065)
Broad Money	-0.011	0.076	0.119	0.120*	0.064
	(-0.209)	(1.109)	(1.571)	(1.664)	(0.915)
Constant	197.610**	287.325**	336.636***	413.082***	199.418
	(2.184)	(2.511)	(2.915)	(3.221)	(1.171)
Observations	235	235	203	203	203
R-squared	0.0822	0.0628	0.0670	0.0462	0.176
Number of Countries	22	22	20	20	20
Country FE	NO	NO	NO	NO	YES
Year FE	YES	YES	YES	YES	YES

Table 29: Business environment determinants of total Public M&A activity.2000-2017.

The dependent variable is the Public Volume measure, as the percentage traded firms that are targets of successful transactions. The dependent variable is regressed using different business environmental variables, controlling for GDP, GDP growth and broad money. T-stats based on robust standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

	DEPENDENT VARIABLE: PUBLIC VOLUME			
VARIABLES	(1)	(2)	(3)	(4)
BRICS	-3.036		-61.070	
	(-0.572)		(-0.886)	
Property Rights	-0.155	-0.126	-0.258	-0.129
	(-1.057)	(-1.411)	(-1.256)	(-1.518)
Property Rights x BRICS			0.398	-0.078
			(1.276)	(-0.815)
Business Freedom	-0.252	0.163**	-0.202	0.214**
	(-1.598)	(2.408)	(-0.832)	(2.552)
Business Freedom x BRICS			-0.122	-0.181
			(-0.435)	(-1.637)
Investment Freedom	-0.133	-0.009	-0.165	-0.019
	(-0.632)	(-0.103)	(-0.528)	(-0.258)
Investment Freedom x BRICS			0.209	-0.024
			(0.582)	(-0.121)
Tax Burden	0.220	-0.165	0.015	-0.041
	(0.944)	(-1.608)	(0.037)	(-0.224)
Tax Burden x BRICS			0.482	-0.225
			(0.767)	(-0.805)
GDP growth	0.283	-0.138	0.534*	-0.214
	(0.727)	(-0.439)	(1.889)	(-0.636)
Ln (GDP)	-8.381***	-6.820	-8.278**	-5.362
	(-2.598)	(-1.132)	(-2.364)	(-0.807)
Broad Money	0.023	0.052	0.074	0.031
	(0.457)	(0.692)	(0.934)	(0.415)
Constant	259.635***	208.467	272.896***	170.481
	(2.846)	(1.307)	(2.623)	(0.953)
Observations	235	235	235	235
R-squared	0.0666	0.177	0.0606	0.181
Number of Countries	22	22	22	22
Country FE	NO	YES	NO	YES
Year FE	YES	YES	YES	YES

8.4   Hausman Test

It is common practice to perform regressions with fixed effects. However, the Hausman Test, a misspecification test, can be performed in order to test if the individual effects are fixed or random. It allows validating the existence of a correlation between unobservable heterogeneity and explanatory variables. If the null hypothesis, which states that there is no correlation between individual effects and regressors (no misspecification and asymptotically efficient estimators), can be

rejected, the fixed effect model is preferred instead of the random effects one. (Hausman, 1978). The results of the tests performed are displayed.

Table 30: Hausman (1978) specification test. Macro-economic determinants of M&A activity. VOLUME (table 9)

	Coef.
Chi-square test value	30.492
P-value	0.39

Table 31: Hausman (1978) specification test. Macro-economic determinants of M&A activity. CROSSVOLUME (table 10)

	Coef.
Chi-square test value	9.391
P-value	1

Table 32: Hausman (1978) specification test. Business environment determinants of M&A activity. VOLUME (table 11). Model 2

	Coef.
Chi-square test value	6.565
P-value	1

Table 33: Hausman (1978) specification test. Business environment determinants of M&A activity. VOLUME (table 11). Model 4

	Coef.
Chi-square test value	21.431
P-value	0.807

Table 34: Hausman (1978) specification test. Business environment determinants of M&A activity. CROSSVOLUME (table 12). Model 2

	Coef.
Chi-square test value	17.574
P-value	0.823

Table 35: Hausman (1978) specification test. Business environment determinants of M&A activity. CROSSVOLUME (table 12). Model 4

	Coef.
Chi-square test value	22.644
P-value	0.751

The test results are in favor of random effects. Then, the different models for random effects are exhibit in the following tables.

Table 35: Macro-economic determinants of M&A activity. Random Effects. 2000-2017.

The dependent variables are Volume and CrossVolume. The volume measure is calculated as the percentage of transactions value to GDP and CrossVolume is measured including only those deals where the acquirer and the target company are from different countries. The dependent variables are regressed using different macro-economic variables, controlling for GDP and broad money. T-stats based on robust standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Dependent Variable VARIABLES	Volume (1)	CrossVolume (2)
GDP Growth	0.006	0.004
	(1.644)	(1.107)
GDP Growth x BRICS	-0.007	-0.007
	(-1.232)	(-1.199)
Inflation	0.000	0.001
	(0.006)	(0.413)
Inflation x BRICS	-0.006	-0.002
	(-1.187)	(-0.275)
Lending interest rate	0.005**	0.003
	(2.303)	(1.356)
Lending interest rate x BRICS	0.001	0.000
	(0.550)	(0.008)
Depreciation	0.001	0.000
	(0.584)	(0.446)
Depreciation x BRICS	-0.001	-0.001
	(-0.944)	(-0.816)
Openness	-0.000	-0.000
	(-0.146)	(-0.884)
Openness x BRICS	0.001	0.001
	(1.593)	(0.786)
Ln (GDP)	-0.018	-0.020
	(-1.438)	(-1.552)
Broad Money	0.001**	0.001*
	(2.341)	(1.840)
Constant	0.415	0.500
	(1.203)	(1.422)
Observations	325	285
R-squared	0.0836	0.0827
Number of Countries	21	21
Country RE	YES	YES
Year FE	YES	YES

The results displayed show few significant results. As in models 3 and 4 from table 9, (macro-economic determinants of M&A activity) in model 1, the lending interest rate has a positive and significant impact on M&A activity. This result is different from the one obtained when using fixed effects. In addition, there are no significant results when analyzing cross-border *(CrossVolume)* activity.

Table 36: Business environment determinants of M&A activity. Random Effects. 2000-2017.

The dependent variables are Volume and CrossVolume. The volume measure is calculated as the percentage of transactions value to GDP and CrossVolume is measured including only those deals where the acquirer and the target company are from different countries. The dependent variables are regressed using different business environmental variables, controlling for GDP, GDP growth and broad money. T-stats based on robust standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Dependent Variable	Volume		CrossVolume	
VARIABLES	(1)	(2)	(3)	(4)
Property Rights	0.001	0.000	-0.001	-0.001*
	(0.865)	(0.475)	(-1.518)	(-1.868)
Property Rights x BRICS		0.004		0.004
		(1.466)		(1.564)
Business Freedom	-0.002**	-0.003***	-0.001	-0.001
	(-2.299)	(-2.856)	(-1.251)	(-1.607)
Business Freedom x BRICS		0.005**		0.002
		(2.071)		(1.104)
Investment Freedom	0.001	0.001	0.001	0.001*
	(1.513)	(1.595)	(1.422)	(1.808)
Investment Freedom x BRICS		-0.000		-0.000
		(-0.178)		(-0.041)
Tax Burden	0.002	0.003**	0.001	0.002**
	(1.238)	(1.993)	(1.409)	(2.189)
Tax Burden x BRICS		-0.006***		-0.004**
		(-2.623)		(-1.975)
GDP growth	0.002	0.002	-0.002	-0.001
	(0.676)	(0.763)	(-0.755)	(-0.233)
Ln (GDP)	0.014	0.029	-0.003	0.005
	(0.756)	(1.345)	(-0.295)	(0.413)
Broad Money	0.001	0.001	0.000	0.000
	(1.249)	(1.603)	(0.915)	(1.631)
Constant	-0.420	-0.840	0.071	-0.187
	(-0.810)	(-1.426)	(0.253)	(-0.544)
Observations	398	398	347	347
R-squared	0.128	0.139	0.0943	0.107
Number of Countries	24	24	24	24
Country RE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES

The results displayed for *Volume* show similar results to the ones obtained when using the Tobit model. While, *Business freedom* has a negative and significant result, *Business freedom in BRICS* has a positive impact on the volume of M&A activity. Regarding *Tax Burden* it has a positive and significant coefficient, at the same time *Tax Burden in BRICS* has a negative and significant effect on M&A activity. As mentioned before, previous findings suggest a negative relation between the *Business Freedom Index* and the volume of M&A activity, what might indicate that a greater facility to establish new businesses encourages greenfield investments. However, a positive relation between this index and M&A for BRICS countries might support the idea of using M&A as a tool to increase

market share. Regarding the positive effect of *Tax Burden,* the tax benefits gained from M&A activity might explain this result.

Concerning the results obtained for *CrossVolume* they are also in line with the ones obtained when using the Tobit Model, except for the outcomes for *Business Freedom*. *Investment Freedom* has a positive and significant coefficient which might indicate that a better regulatory environment and a more open market implies a higher the level of M&A activity.

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