### Effect of Global and Local Factors on

### **Emerging Markets Non-Financial Corporate Bond Issuance**

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### Abstract

Financing through bond issuance is a relatively new phenomenon for emerging markets, especially for non-financial corporations. While access to and development of the global financial markets contributed to the recent surge in non-financial corporate bond issuance, effectiveness of local monetary policies might come under question in the face of financial globalization. In this paper, I analyzed the effect of local and global factors on the quantity of non-financial corporate bond issuance across selected emerging markets. The results suggest that global factors such as the global risk environment and the US real interest rate are more effective in explaining quarterly bond issuance than local factors. The study finds a negative relationship between the quantity of emerging markets non-financial bond issuance and global factors such as the VIX index (for the bonds denominated in USD) and the US real interest rate (for the bonds denominated in local currency). On the contrary, local factors such as domestic real interest rate, equity return and equity volatility seem to have no effect. The study calls for more rigorous and normative approach of local monetary policies aimed at the corporate debt sector.

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# **Table of Contents**

Abs	stract	i
Acł	knowledgements	ii
List	t of Figures and Tablesin	v
1.	Introduction	1
2.	Background and Motivation	2
3.	Descriptive Statistics	7
4.	Methodology1	5
5.	Empirical Results	6
6.	Robustness Checks2	1
7.	Discussion2	5
8.	Conclusion	6
Bib	liography28	8

# List of Figures and Tables

Figure 1.	Stock of Private Sector International Debt in All Emerging Markets
Figure 2.	Yearly non-financial corporate bond issuance by country (local currency)9
Figure 3.	Yearly average real interest rate by country11

Table 1. List of Countries	. 8
Table 2. Summary statistics of variables	14
Table 3. Tobit Random Effects results, dependent variable as percentage of GDP	18
Table 4. Country Fixed Effects results, dependent variable as percentage of GDP	19
Table 5. Country Fixed Effects results, dependent variable in million USD	20
Table 6. Country Fixed Effects results, including Chile, Peru, Mexico and China	23
Table 7. Country fixed effects, growth of bank lending as additional variable	24

### 1. Introduction

Over the last decade, global economy witnessed a considerable surge in the corporate bond market. More and more firms are opting to issue debt through bond issuance instead of traditional bank lending. Major emerging economies like China, Brazil, Thailand and Indonesia, to name a few, are no exceptions. Another trend throughout major economies was a steady decrease in central banks' policy rates to boost their economies by making debt cheaper. Moreover, the last two decades saw the deepening and widening of global financial markets. In this paper, I will try to argue that external factors such as the US real interest rate and the global risk environment can explain the rise in non-financial corporate bond issuance in emerging markets more than the local factors. To test my argument, I will use non-financial corporate bond issuance as my dependent variable and see if real policy rate had an impact while controlling for other variables such as equity volatility, real GDP growth, bank lending, the VIX index and so on.

The surge in emerging market corporate bond issuance is a relatively new phenomenon which has its own risk and reward. There are studies which analyze the same issue in the perspective of company-level characteristics, focusing on bonds denominated in USD with international spillovers and effects of regional programs targeting the improvement of local bond market<sup>1</sup>. The study contributes to this literature by primarily focusing on non-

<sup>&</sup>lt;sup>1</sup> All these studies by Lo Duca, Nicoletti, and Vidal Martínez (2016), Mizen and Tsoukas (2014) and others will be mentioned in the next section.

financial corporate bond issuance denominated in local currency and USD separately, in the select emerging markets with data aggregated quarterly and inclusion of a wider timeframe which includes 2013 onwards – a tumultuous time for global fixed income market.

### 2. Background and Motivation

In simple terms, bond is a debt instrument to be borrowed for a defined period at a specific interest rate. Bonds are relatively a safer investment than stocks or certain types of derivatives. As simple as it can sound, there are numerous types of bonds ranging from fixed coupon rate government bonds with no maturity to variable coupon rate socially responsible corporate bonds<sup>2</sup>.

The last two decades witnessed a surge in total corporate debt across emerging markets. The more interesting part is the composition of this debt increase. More and more corporations were opting for debt issued in international bonds. From Figure 1, we can see that since the onset of the new century, emerging market corporate debt increased almost five-fold from 500 billion to 2.5 trillion US dollars, corporate bonds being responsible for the larger share of this increase (Caballero, Fernandez, and Park 2016, p 11). Even though we can see a slowdown in increase during the 2008-2009 financial crisis, it continued to increase rapidly after this crisis.



Figure 1. Stock of Private Sector International Debt in All Emerging Markets

Note: "This figure shows the aggregate stock of private sector international debt for 17 emerging economies (EMEs), decomposing the outstanding stock into cross-border bank loans and international debt securities (bonds). The stock of securities is on a nationality basis. The private sector includes all financial institutions and non-financial corporations. The regional aggregations are as follows: East Asia and Pacific: Indonesia, Korea, Malaysia, Philippines, and Thailand. East Europe and Central Asia: Czech Republic, Hungary, Poland, Russia, and Turkey. Latin America: Brazil, Chile, Colombia, Mexico and Peru. Other Regions: South Africa, and Israel. The data are presented in billions of current U.S. dollars and sourced from the BIS Locational Banking Statistics and BIS Securities Statistics databases" (figure is taken from Caballero, Fernandez, and Park 2016, p. 10).

The study by Ayala, Nedeljkovic, and Saborowski (2017) analyzes reasons and drivers behind the shift of corporate debt market from bank loans towards bonds and finds that global factors especially after global financial crisis are better at explaining variation than local factors. Authors analyze corporate bond issuance as the percentage of overall debt market distinguishing between local and foreign currency, and find differences between the effectiveness of global and local factors during pre-crisis and post-crisis periods, as well as differences between countries in absorbing external shocks: "the case of local currency bond markets, local fundamentals appear to have played an important role in explaining market development and the strength of transmission of global shocks to individual LC (local currency) markets. In foreign currency bond markets, in turn, domestic fundamentals have played little role in driving the post-crisis boom" (Ayala, Nedeljkovic, and Saborowski 2017, p. 22–31)

Financing through bonds has multiple advantages over loans. One reason is that usually it is cheaper to issue bonds with lower interest rate than bank loans. Another reason is that companies have relative freedom in tailoring the terms of bonds they issue - whether to issue callable or non-callable bond, or to issue with fixed or variable coupon rate, or even to choose debt security currency. All these, accompanied with greater access to global financial markets, shifted the gravity of composition of debt towards bonds across emerging markets.

Issuing bonds comes with disadvantages as well, but from an unexpected direction - not from individual corporate level but sectoral. Since private corporations are the major backbone of national economy, higher debt can entail some systemic risks: "high corporate leverage may pose macroeconomic or sectoral risks if financial losses threaten the viability of the firm or require a scaling down in the level of production. While these risks might be perceived as non-material at the level of an individual firm, correlated strategies across corporates mean that the scale of aggregate risk-taking may be substantial" (Eichengreen et al. 2015, p 8). This is the primary reason why local authorities should keep in mind synchronization of national debt sector with global markets, which can undermine the effectiveness of local economic policies. The recent report by BIS last year warned that there will be 340 billion USD debt maturing in emerging markets during next couple of years and it will be major test for those economies:

"Given the steep repayment schedule that lies ahead, the refinancing capacity of highly leveraged EME companies is likely to be tested soon, especially if the rise of the US dollar continues. As the issuance boom began

4

in 2010 and featured long maturities, scheduled repayments have been modest so far. But they rise quite sharply from 2016. According to the BIS's latest estimate, these repayments will total \$340 billion over the years 2016, which is 40% more than during the past three years and, on an annualized basis, amounts roughly to the net issuance of bonds by EME non-banks in 2015" (Tarashev, Avdjiev, and Cohen 2016).

When studying corporate bond issuance, firm-specific characters can play a crucial role.

Mizen and Tsoukas (2014) studied firm-specific characteristics as well as regional

development programs aimed at improving bond market for the period 1995-2007 in Asia.

Authors found that regional programs such as the introduction of Asian Bond Funds (ABF

and ABF2) had helped to ignite corporate bond market throughout Asia in early 2000

(Mizen and Tsoukas 2014; see also Chan et al. 2011). However, Mizen and Tsoukas

(2014) identified that firm-specific characteristics such as size, creditworthiness, higher

profitability and collateral have the most impact on the probability of bond issuance.

Moreover, Levine et al. (2012) argues that issuing bond in domestic and overseas market

by the same firm varies, which can affect credit spread, currency choice or even size of

those bonds:

"We find that firms issue different types of bonds in domestic and international markets. International bond issues are larger, of shorter maturity, tend to be denominated in foreign currency, and are more likely to be fixed interest rate contracts. Moreover, we find that issues abroad tend to entail lower yield spreads than issues at home. All of these results hold after conditioning on different bond characteristics, country-year dummies, and firm-level fixed effects, and even when analyzing only firms that issue debt both at home and abroad. These findings suggest that firms face different borrowing costs in different types of securities. Firms seem to be using these markets as complements rather than as substitutes" (Levine et al. 2012, p. 28–29).

As Figure 1 suggests, the global financial crisis was just a bump in the surge of corporate bond issuance. Therefore, as much as the firm-specific characteristics can matter, local and global macroeconomic variables cannot be ignored.

A similar study to mine was carried out by Lo Duca, Nicoletti, and Vidal Martínez (2016), which analyzes the effect of unconventional monetary by US Federal Reserve and global corporate bond issuance primarily focusing on bonds denominated in USD including developed and emerging markets. They also look at the emerging markets corporate bond issuance separately and find that global factors better explain variation in corporate bond issuance than local variables (Lo Duca, Nicoletti, and Vidal Martínez 2016). Another important finding is that "gross corporate bond issuance was strongly synchronized across a large sample of advanced and emerging economies since 2009, with issuance in the highest quartile almost everywhere in 2012. This suggests that bond issuance volumes can be explained by common factors rather than by country/firm specific factors" (Lo Duca, Nicoletti, and Vidal Martínez 2016).

Due to being recent phenomenon, there is not much literature on this topic which was another motivation for me to study this issue. Financial globalization and technological development over the last two decades encourages us to revisit dynamics behind emerging markets corporate debt market.

#### 3. Descriptive Statistics

**Bond Issuance as percentage of GDP –** List of emerging market economies were taken from MSCI, countries which are included in MSCI Emerging Market Index<sup>3</sup>. After downloading corporate bond data for all countries, I kept major emerging market economies with active bond issuance between 2001 and 2015 (Table 1 contains the list of countries). Eventually I excluded Peru, Chile and Mexico due to lack of central bank interest rate data for early 2000s to keep my panel data balanced.

I decided to exclude China as well, because upon inspection there were many big issuances by government-run corporations and provinces which were classified as corporate (for the reasons unknown to me). There were issuances by government owned corporations in other countries as well, but they were much fewer and smaller than China. Another concern was that Chinese government-owned corporations have different level of risk and other dynamics than their similar counterparts in other countries. This argument is supported by Pessarossi and Weill (2013) when they analyzed over 200 listed companies in China between 2006 and 2010 and found that "…ownership influences the choice of corporate debt in China because Central State owned firms are more likely to issue a bond, rather than a syndicated loan… where results show that financial factors do not play a strong role in debt choices, whereas ownership matters" (Pessarossi and Weill 2013, p. 2). I will report results including China, Mexico, Peru and Chile in the robustness section.

<sup>&</sup>lt;sup>3</sup> MSCI market classification is available at: <u>https://www.msci.com/market-classification</u> accessed on 05.05.2017

Countries in MSCI Emerging		Countries in my analysis	
Market Index			
Brazil Chile Mexico Peru Czech Republic Egypt Greece Hungary Poland Qatar Russia South Africa Turkey United Arab Emirates Saudi Arabia China India Indonesia South Korea Malaysia Philippines Taiwan Thailand	BRA CHL MEX PER CZEY GRC HOL QAT RUS TUR ARU CHD IDN R SAU NDN R SAU NDN R SAU NDN R S HUN TWN THA	Brazil Russia South Africa India Indonesia South Korea Malaysia Taiwan Thailand Chile* Mexico* Peru* China**	BRA RUS ZAF IND IDN KOR MYS TWN THA CHL MEX PER CHN

### Table 1. List of Countries

\*Countries were excluded due lack of data in the main analysis

\*\* For exclusion reason see Descriptive Statistics section

Bond data was collected from Standard & Poor's Capital IQ database. After filtering for countries and dates, the following corporate bond types were chosen: Corporate Convertible, Corporate Inflation Indexed, Corporate Debentures, Corporate MTN, Corporate MTN Zero, Corporate Pass Thru, Corporate PIK Bond, Corporate Strip, Corporate Zero, Corporate Insured Debenture and Corporate Bank Note. As an industry classification, everything was included apart from bond issued by financial companies such as banks and investment funds. Assumption for exclusion of issuance by financial

entities was that dynamics of bond issuance differs between financial and non-financial firms in terms of purpose, timing, access to global capital markets and so on.

Data provided by Capital IQ distinguishes between the geographic location of issuer and the geographic location of ultimate parent of issuer. I used the geographic location of issuer as a country classification. This is a bit different from BIS classification, but in my subset of data there were very few issuers where location of issuer and ultimate parent did not match. These observations were not excluded, since I am interested in the link between local currency and local interest rate, and I believe local issuer will incorporate local interest rates into its decision-making when issuing bonds denominated in local currency.

After aggregating corporate bond issuance, I divided it by nominal GDP at current prices. Figure 2 presents time series of the dependent variable.



Figure 2. Yearly non-financial corporate bond issuance by country (local currency)



**Real Interest Rate** – Central bank policy rates were collected individually from Thomson Reuters Datastream. In basic terms, interest rate is the rate at which banks can borrow money from central bank. Central bank can intervene with its available tools to change the interest rate. This is the main interest rate which is used as a benchmark in domestic financial transactions such as mortgage loans or coupon rate of bonds denominated in that country's currency. Unfortunately, terms of this borrowing can differ among countries. In other words, most of the time we cannot fully compare two central bank policy rates of two different countries. For example, policy rate can represent the cost of borrowing for 1 day in one country and can represent the cost of borrowing for 3 months in another country. But, as we are concerned with the trends and changes, these differences should not cause much problem for the analysis. To calculate real interest rate, I subtracted inflation rate calculated using seasonally unadjusted Consumer Price Index collected from Datastream. Figure 3 presents yearly real interest rate by country below.







One of the main channels monetary policy can affect borrowing and spending by firms is the balance sheet channel, where expansionary monetary policy (e.g. lower interest rates) can increase the net worth of the corporations therefore increasing their creditworthiness, which can lead to investment and borrowing decision by firms (Mishkin 1996).

**Domestic Risk and Return Variables** – To control for domestic risk and return, I used MSCI country indices to calculate quarterly equity volatility and return. Primary reason using MSCI country indices is that it makes easier to compare country stock volatility and returns. MSCI country indices are highly correlated with each country's main equity index. These two variables can influence the demand and supply of bonds in various ways. During high volatility or low return investors can prefer bonds which are considered to be safer and steadier source of income. In this paper, equity volatility is the average standard deviation of daily returns and equity return is the percentage change from previous quarter's closing value.

**Real GDP growth** – Unfortunately, I could not get quarterly forecasted GDP for countries in my analysis. I used current realized real GDP growth as control. Most bonds have a maturity date longer than one year and I believe that using forecasted GDP can be more appropriate than current GDP. However, even using next year's forecasted GDP can be misleading- because most non-financial corporate bonds have a maturity date more than one year. The assumption here is that companies are forward-looking when issuing bonds when it comes to economic performance of country. Real GDP growth was calculated by subtracting inflation rate from nominal GDP growth quarter on quarter basis. Data on nominal quarterly GDP was collected from International Financial Statistics (IFS) database of International Monetary Fund (IMF)<sup>4</sup> and Datastream.

**Global variables** – As a measure of global economic environment, I used real GDP growth of USA. VIX was used to control for the global risk environment: "the Chicago Board Options Exchange (CBOE) Volatility Index® (VIX® Index®) is a key measure of market expectations of near-term volatility conveyed by S&P 500 stock index option prices and is usually referred as "fear gauge" of investors"<sup>5</sup>. VIX is indicator which is negatively correlated with credit inflows across global economics and can explain variation to a great extent (Rey 2015). Due to risky global economic environment, countries can choose not to issue bonds. An argument can be made for opposite side as well since bonds are considered as relatively safe asset, demand for bonds can rise in times of high volatility in equity markets. The VIX index, I believe, captures global economic environment to a great extent and can be used as control variables affecting companies' decisions to issue bonds.

**Dummy variables** – To account for seasonality I will introduce quarterly dummies. The assumption here is that beginning, middle or end of financial year can affect decision making for corporations to issue bonds for various reasons such as tax regulation or market activity. I will introduce dummy variable for Russia for 2014 onward to control for

<sup>&</sup>lt;sup>4</sup> International Financial Statistics (IFS) by IMF: <u>http://data.imf.org/?sk=5DABAFF2-C5AD-4D27-A175-1253419C02D1</u> accessed on 05/05/2017

<sup>&</sup>lt;sup>5</sup> CBOE VIX Index page: <u>http://www.cboe.com/products/vix-index-volatility/vix-options-and-futures/vix-index</u> accessed on 05/05/2015. For more information on CBOE VIX index refer to <u>https://www.cboe.com/micro/vix/vixwhite.pdf</u>

negative effect of international sanctions against Russia due to Crimean Annexation. I will also include dummy for the 2008-2009 global financial crisis.

**Bank lending** – In robustness check section, I will introduce an additional variable which is growth of bank lending quarter on quarter basis. Data on bank lending to private nonfinancial sector as a percentage of GDP was collected from Bank for International Settlements (BIS) database<sup>6</sup> except for Taiwan. For Taiwan, data on bank lending to private sector was collected from Datastream. This is an important variable to control for substitution effect between financing through loan and bond issuance. In times of low supply of bank loans, especially after the 2008-2009 global financial crisis, corporations may resort to bond issuance if the bank credit market is scarce.

Statistic	Ν	Mean	Min	Max
Local bond as %GDP	540	0.704	0.000	8.310
USD bond as %GDP	540	0.752	0.000	13.480
Local bond in million USD	540	1,154.700	0.000	10,700.000
USD bond in million USD	540	1,542.930	0.000	20,827.000
Local real interest rate	540	1.789	-9.790	16.930
US real interest rate	540	-0.524	-3.510	3.310
MSCI equity return	540	12.337	-74.160	140.360
MSCI equity volatility	540	8.143	0.586	1,153.810
Bank lending growth	540	1.167	-21.500	17.656
Real GDP growth	540	5.096	-21.530	22.040
CBOE VIX index	540	20.493	11.035	58.596

 Table 2. Summary statistics of variables

<sup>&</sup>lt;sup>6</sup> BIS database on total credit: <u>https://www.bis.org/statistics/totcredit.htm</u> accessed on 10/05/2017

#### 4. Methodology

Data used is time series panel data and the main model of my analysis is country fixed effects. The main reason behind using country fixed effects is to account for country specific time invariant characteristics. One such example is the tax regulation of countries. Of course, it is possible for countries to change tax regulation over time. However, the assumption here is that between 2001 and 2015 countries did not change much in terms of such variables as tax regulation or financial openness, which can affect non-financial corporate bond issuance.

$$y_{i,t} = R_{i,t}\beta + X_{i,t}\theta + \alpha_i + \varepsilon_{it}$$

Here, dependent  $y_{i,t}$  variable represents the quantity of non-financial corporate bond issuance as a percentage of GDP in country *i* and time *t*.  $R_{i,t}$  is the real policy rate in country *i* and time *t*.  $X_{i,t}$  is set of control variables described above.  $\alpha_i$  unobserved country specific time invariant effects in country *i* and  $\varepsilon_{it}$  is error term. Since bond issuance is censored at zero, I will first report Tobit random effects estimates as a benchmark model. Companies cannot issue negative amount of bonds; thus it will be very useful to see Tobit estimates as a reference point.

To control for heteroskedastic and serially correlated standard errors, all the results are reported with cluster-robust standard errors which is preferable in individual fixed effect models. All data in my analysis are aggregated on quarterly level.

#### 5. Empirical Results

Since our dependent variable is censored at zero, first it will be good to look at random effects with country dummies Tobit estimates. In Table 3, column (1) and (3) report Tobit random effects results without global variables; column (2) and (4) report Tobit random effects results with global variables. As expected, real interest rate has statistically significant effect on non-financial corporate bond issuance. Both local and US real interest rates have negative effect on bond issuance as a percentage of GDP (%GDP). Nevertheless, we find weaker effect for local interest rate and no effect for US interest rate for bond issuance denominated in USD. One reason explaining the absence of US real interest rate effect might be that dynamics behind bond issuance denominated in foreign currency can be different from the ones denominated in local currency such as change in global demand for USD assets and spillover effects of unconventional monetary policy by US Federal Reserve (for more details see Lo Duca, Nicoletti, and Vidal Martínez (2016)). Also, as expected, adding global variables reduces effect on local interest rate substantially. This can mean that with highly globalized financial markets, corporations are more responsive to global variables such as rising global demand for safe or relatively higher return assets.

In Table 4, column (1) and (3) report country fixed effects results without global variables; column (2) and (4) report country fixed effects results with global estimates. As expected, overall results are similar to censored random effects results with few important exceptions. We estimate country fixed effects to account for time invariant country characteristics such as tax regulation or financial openness, which are assumed not to change too much over the time. Without controlling for global variables, across all

emerging economies +1 percentage point (p.p.) higher real interest rate will result in -0.027 lower non-financial corporate bond issuances as %GDP. However, this is not true for bond issuances denominated in USD which is also expected. Introducing global variables such as US real interest rate, US GDP growth and CBOE VIX index yields interesting results.

Firstly, the real interest rate lost statistical significance after introducing global variables. It seems that much of the variance in local bond issuance as percentage of GDP can be explained through global macroeconomic variables. Seemingly, the US real interest rate has substantial effect on the emerging markets non-financial corporate bond issuance. Higher 1 p.p. US real interest rate results in -0.059 lower non-financial corporate bond issuance in local currency is 0.7%, 1 p.p. higher US real interest rate can translate into 8.4% decrease in non-financial corporate bond issuance on average.

When it comes to bond issuance denominated in USD neither local nor US real interest rate seems to be significant. Rather, the only significant variable, not surprisingly, is VIX index. VIX index is one of the best measures of market volatility and global risk environment. This is in line with the argument that global risk has negative effect on bond issuance from emerging market corporations which have usually lower credit rating than their counterparts in developed markets. Surprisingly, financial crisis did not have much effect on corporate bond issuance. This effect could be mitigated by a decrease in real interest rates across emerging markets. This is an area of potential research to investigate the exact effects and channels of the global financial crisis on corporate bond issuance across emerging markets.

17

		Dependent variable:				
	Local Bond	Local Bonds as %GDP		s as %GDP		
	(1)	(2)	(3)	(4)		
local real rate	-0.027***	-0.017**	-0.063**	-0.049*		
	(0.008)	(0.009)	(0.027)	(0.027)		
US real rate		-0.059**		0.009		
		(0.024)		(0.048)		
equity return	0.002	0.001	0.008***	0.004		
	(0.001)	(0.001)	(0.002)	(0.002)		
equity volatility	-0.001	-0.001	-0.001	-0.001		
	(0.001)	(0.001)	(0.002)	(0.002)		
real GDP growth	-0.023***	-0.021***	-0.010	-0.007		
	(0.007)	(0.007)	(0.014)	(0.015)		
Russian sanctions	-0.169	-0.182	-1.419**	-1.526**		
	(0.289)	(0.298)	(0.687)	(0.661)		
US GDP growth		-0.036**		$0.065^{*}$		
		(0.017)		(0.035)		
VIX		-0.009		-0.047***		
		(0.006)		(0.012)		
2nd quarter	0.236**	0.224**	0.181	0.139		
	(0.100)	(0.102)	(0.199)	(0.196)		
3rd quarter	0.013	0.010	-0.066	-0.019		
	(0.100)	(0.103)	(0.199)	(0.197)		
4th quarter	0.160	0.137	-0.117	0.018		
	(0.099)	(0.105)	(0.199)	(0.201)		
Crisis dummy	-0.003	0.002	-0.662***	0.041		
	(0.107)	(0.135)	(0.230)	(0.274)		
logSigmaMu	-0.232***	-0.121**	-0.492***	-0.488***		
	(0.029)	(0.050)	(0.163)	(0.154)		
logSigmaNu	-0.247***	-0.225***	0.417***	0.401***		
	(0.029)	(0.034)	(0.040)	(0.040)		
Constant	0.674***	0.950***	0.506**	1.152***		
	(0.082)	(0.151)	(0.217)	(0.312)		
Observations	540	540	540	540		
Log Likelihood	-697.730	-694.307	-784.709	-774.656		
Akaike Inf. Crit.	1,419.460	1,418.610	1,593.420	1,579.310		
Bayesian Inf. Crit.	1,470.960	1,482.990	1,644.920	1,643.680		

# Table 3. Tobit Random Effects results, dependent variable as percentage of GDP

#### Note:

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

(1) and (2) column dependent variable is issuance of bonds denominated in local currency as percentage of GDP, without and with global controls respectively. (3) and (4) column dependent variable is issuance of bonds denominated in USD as percentage of GDP, without and with global controls respectively. Country dummies were excluded.

	Dependent variable:				
	Local Bond	Local Bonds as %GDP		s as %GDP	
	(1)	(2)	(3)	(4)	
local real rate	-0.031**	-0.017	-0.029	-0.028	
	(0.015)	(0.015)	(0.021)	(0.022)	
US real rate		-0.059**		0.018	
		(0.024)		(0.034)	
equity return	0.001	0.001	0.004***	0.002	
	(0.001)	(0.001)	(0.002)	(0.002)	
equity volatility	-0.001	-0.001	0.0001	0.0001	
	(0.001)	(0.001)	(0.001)	(0.001)	
real GDP growth	-0.015**	-0.021***	-0.008	-0.007	
	(0.007)	(0.007)	(0.010)	(0.011)	
Russian sanctions	-0.162	-0.174	-0.877 <sup>*</sup>	-1.030**	
	(0.328)	(0.327)	(0.464)	(0.464)	
US GDP growth		-0.036**		0.030	
		(0.017)		(0.024)	
VIX		-0.009		-0.020**	
		(0.005)		(0.008)	
2nd quarter	0.245**	0.225**	0.116	0.091	
	(0.098)	(0.098)	(0.139)	(0.138)	
3rd quarter	0.025	0.010	-0.080	-0.058	
	(0.098)	(0.098)	(0.139)	(0.138)	
4th quarter	0.171*	0.137	-0.137	-0.060	
	(0.098)	(0.100)	(0.139)	(0.142)	
Crisis dummy	0.006	0.002	-0.252 <sup>*</sup>	0.078	
	(0.107)	(0.132)	(0.152)	(0.188)	
Observations	540	540	540	540	
R <sup>2</sup>	0.494	0.504	0.091	0.107	
Adjusted R <sup>2</sup>	0.477	0.485	0.062	0.073	
Residual Std. Error	0.805 (df = 522)	0.798 (df = 519)	1.138 (df = 522)	1.131 (df = 519)	

# Table 4. Country Fixed Effects results, dependent variable as percentage of GDP

Note:

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Country dummies were excluded. (1) and (2) column dependent variable is issuance of bonds denominated in local currency as percentage of GDP, without and with global controls respectively. (3) and (4) column dependent variable is issuance of bonds denominated in USD as percentage of GDP, without and with global controls respectively.

	Dependent variable:				
	Local Bonds	Local Bonds in mln USD		in mln USD	
	(1)	(2)	(3)	(4)	
local real rate	-139.74***	-92.37***	-247.35***	-211.43***	
	(26.12)	(26.35)	(41.55)	(42.72)	
US real rate		-208.11***		-131.69**	
		(41.17)		(66.75)	
equity return	-0.22	-0.55	2.92	-1.39	
	(1.90)	(2.03)	(3.03)	(3.28)	
equity volatility	-2.09 <sup>*</sup>	-1.76 <sup>*</sup>	-1.74	-1.36	
	(1.09)	(1.06)	(1.74)	(1.71)	
real GDP growth	-25.98**	-41.97***	6.32	-2.55	
	(12.87)	(12.73)	(20.48)	(20.64)	
Russian sanctions	-791.13	-918.60	-3,412.13***	-3,786.54***	
	(578.11)	(561.97)	(919.76)	(911.08)	
US GDP growth		-70.09**		25.76	
		(28.96)		(46.96)	
VIX		-37.39***		-62.04***	
		(9.37)		(15.19)	
2nd quarter	25.79	-45.69	304.00	213.93	
	(172.77)	(167.69)	(274.88)	(271.87)	
3rd quarter	-173.23	-192.09	-213.56	-176.62	
	(172.99)	(167.83)	(275.22)	(272.09)	
4th quarter	131.31	92.49	-24.94	111.75	
	(172.98)	(171.75)	(275.21)	(278.45)	
Crisis dummy	-305.69	-76.97	-689.91**	120.59	
	(188.96)	(227.22)	(300.62)	(368.38)	
Observations	540	540	540	540	
R <sup>2</sup>	0.31	0.36	0.31	0.33	
Adjusted R <sup>2</sup>	0.29	0.34	0.28	0.31	
Residual Std. Error	1,418.05 (df = 522)	1,370.29 (df = 519)	2,256.07 (df = 522)	2,221.55 (df = 519)	

# Table 5. Country Fixed Effects results, dependent variable in million USD

Note:

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Country dummies were excluded. (1) and (2) column dependent variable is issuance of bonds denominated in local currency as percentage of GDP, without and with global controls respectively. (3) and (4) column dependent variable is issuance of bonds denominated in USD in millions of USD, without and with global controls respectively.

One surprising result was negative coefficient for both local and US real GDP growth. It can be explained through various ways. One of such explanations is that current real GDP growth might not matter at all, because corporations and investors are usually forwardlooking when it comes to bonds. Therefore, it would be preferable to use forecasted GDP growth rather than current one. Unfortunately, I was not able to collect quarterly GDP forecast for countries in my list - but it will be interesting to see results with this variable as well.

Looking at the results with dependent variable in levels (million USD) we can see similar results. In Table 5, column (1) and (3) report country fixed effects results without global variables; column (2) and (4) report country fixed effects results with global estimates. We can see similar results as before. US real interest rate has by far the biggest estimate on bonds issued in local currency. Higher 1 p.p. US real interest rate results in 208 million USD lower non-financial corporate bond issuances on average. Again, we notice significant results for VIX, both for bonds issued in local and foreign currency.

In order to account for non-stationarity in time series in our data, I tested all variable using panel data unit root tests for trends (see Perron (1988)). All the variables passed unit root tests, which means all the variables in this analysis have stationary time series.

#### 6. Robustness Checks

For robustness check, I estimated fixed effect results with China, Mexico, Chile and Peru included. In Table 6, column (1) and (2) report country fixed effects results with dependent variable as %GDP; column (3) and (4) report country fixed effects results with dependent variable in million USD. Here, similar results are observed, US real interest rate is statistically significant, higher 1 p.p. US real interest rate results in -0.066 p.p. lower non-

21

financial corporate bond issuances as %GDP, 9.5% lower issuance on average. VIX has statistical significance when it comes to bonds denominated in USD, which is expected since demand for these assets is globally driven. Due to the inclusion of China, we can see positive estimate in column (3) for local real interest rate. This can stem from data which includes large issuances from "sub-government" entities, but this did not affect variables in column (1) much.

Table 7 reports results with the addition of growth of bank lending as %GDP, column (1) and (2) report country fixed effects results with dependent variable as %GDP; column (3) and (4) report country fixed effects results with dependent variable in million USD. To see substitution effect between bank lending and bonds by non-financial corporations, I introduce a new variable: bank lending growth. This is important, because rise in corporate bond issuance can be due to retrenchment of banking sector especially after financial crisis. Therefore, we should expect negative correlation between bank lending growth and non-financial corporate bond issuance (for more details on channels of substitution between bank lending and corporate bonds see Adrian, Colla, and Shin (2012)). Nevertheless, findings suggest the quite opposite picture. This finding indicate that banks and bonds market are complementing each other rather than substitute; banks are usually primary actors in underwriting, dealing, holding and trading of corporate bonds (Hawkins 2002). We see positive correlation between bank lending growth to nonfinancial private sector and non-financial corporate bond issuance where 1 p.p. increase in bank lending growth is accompanied by 0.026 higher bond issuance as %GDP.

22

	Dependent variable:				
-	Local Bonds as %GDP	USD Bonds as %GDP	Local Bonds in mln USD	USD Bonds in mln USD	
	(1)	(2)	(3)	(4)	
local real rate	0.011	-0.021	377.298***	-161.800***	
	(0.013)	(0.023)	(111.682)	(56.233)	
US real rate	-0.066***	-0.014	-872.780 <sup>***</sup>	-339.606***	
	(0.020)	(0.035)	(171.046)	(86.123)	
equity return	0.001	-0.001	-4.502	-1.276	
	(0.001)	(0.002)	(8.514)	(4.287)	
equity volatility	-0.001	0.0001	-1.041	-1.168	
	(0.001)	(0.001)	(5.106)	(2.571)	
real GDP growth	-0.016**	-0.006	-132.372**	-77.900***	
	(0.006)	(0.011)	(54.887)	(27.636)	
Russian sanctions	0.038	-1.187**	-51.199	-4,761.230***	
	(0.307)	(0.539)	(2,664.630)	(1,341.660)	
US GDP growth	-0.025 <sup>*</sup>	0.023	-105.416	-10.271	
	(0.014)	(0.024)	(118.752)	(59.792)	
VIX	-0.007	-0.027***	-94.848**	-101.282***	
	(0.004)	(0.008)	(38.825)	(19.548)	
2nd quarter	0.221 <sup>***</sup>	-0.040	485.662	262.547	
	(0.080)	(0.141)	(697.650)	(351.271)	
3rd quarter	0.031	-0.017	294.774	-273.623	
	(0.080)	(0.141)	(696.952)	(350.920)	
4th quarter	0.149 <sup>*</sup>	0.029	825.322	180.981	
	(0.082)	(0.144)	(714.131)	(359.569)	
Crisis dummy	0.181 <sup>*</sup>	-0.179	1,159.590	-320.420	
	(0.107)	(0.188)	(927.833)	(467.169)	
Observations	733	733	733	733	
R <sup>2</sup>	0.494	0.262	0.477	0.302	
Adjusted R <sup>2</sup> Residual Std. Error (df =	0.477	0.237	0.459	0.279	

# Table 6. Country Fixed Effects results, including Chile, Peru, Mexico and China

Note:

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Country dummies were excluded. (1) and (2) column dependent variable is issuance of bonds denominated in local currency and in USD as percentage of GDP respectively. (3) and (4) column dependent variable is issuance of bonds denominated in local currency and USD in millions of USD respectively.

	Dependent variable:			
_	Local Bonds as %GDP	USD Bonds as %GDP	Local Bonds in mln USD	USD Bonds in mln USD
	(1)	(2)	(3)	(4)
local real rate	-0.020	-0.028	-95.615***	-214.533***
	(0.014)	(0.022)	(26.395)	(42.858)
US real rate	-0.055**	0.017	-203.894***	-127.654**
	(0.024)	(0.034)	(41.200)	(64.699)
equity return	0.001	0.002	-0.583	-1.423
	(0.001)	(0.002)	(2.023)	(3.285)
equity volatility	-0.001	0.0001	-1.692	-1.289
	(0.001)	(0.001)	(1.056)	(1.714)
bank lending growth	0.026***	-0.005	22.941	21.960
	(0.008)	(0.012)	(14.525)	(23.585)
real GDP growth	-0.016**	-0.008	-37.922***	1.326
	(0.008)	(0.011)	(12.968)	(21.056)
Russian sanctions	-0.179	-1.029**	-922.719	-3,790.490***
	(0.325)	(0.464)	(561.171)	(911.209)
US GDP growth	-0.031 <sup>*</sup>	0.029	-65.775**	29.887
	(0.017)	(0.024)	(29.050)	(47.170)
VIX	-0.007	-0.020***	-35.722***	-60.437***
	(0.005)	(0.008)	(9.413)	(15.284)
2nd quarter	0.226 <sup>**</sup> (0.097)	0.091 (0.138)	-44.245 (167.454)	215.311 (271.905)
3rd quarter	0.006	-0.057	-195.969	-180.333
	(0.097)	(0.139)	(167.606)	(272.152)
4th quarter	0.131	-0.059	87.527	107.000
	(0.099)	(0.142)	(171.534)	(278.530)
Crisis dummy	-0.052	0.087	-124.575	75.016
	(0.132)	(0.189)	(228.889)	(371.662)
Observations	540	540	540	540
R <sup>2</sup>	0.513	0.108	0.363	0.333
Adjusted R <sup>2</sup>	0.494	0.072	0.337	0.306
Residual Std. Error (df = 518)	0.792	1.132	1,368.330	2,221.840

# Table 7. Country fixed effects, growth of bank lending as additional variable

Note:

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Country dummies were excluded. (1) and (2) column dependent variable is issuance of bonds denominated in local currency and in USD as percentage of GDP respectively. (3) and (4) column dependent variable is issuance of bonds denominated in local currency and USD in millions of USD respectively.

#### 7. Discussion

Even though the rise of the emerging economy bond market is a relatively new trend, there are lessons to be learnt from this and similar other studies for policymakers. On the one hand, development and improvement of alternative financing channels for corporations are almost always welcomed. The abundance of various financing channels enables corporations to manage risk better and borrow cheap both from domestic and international capital markets. On the other hand, especially after global financial crisis, the problem of "hot money" is a reoccurring issue. The more flexibility investors possess in investing money in given economy, the more flexibility they have in pulling out those investments. The more synchronized emerging market countries with global economic cycles, the more vulnerable they can be to external shocks.

Mainstream economic view suggests that small open economies can have two out of three<sup>7</sup>: free capital inflow, independent monetary policy or fixed exchange rate. In other words, the independent monetary policy is possible with free capital inflow and floating exchange rate. However, this study alongside other recent findings about synchronization of small emerging economies with global markets questions this trilemma. Work by Rey (2015) is especially noteworthy in this respect where the author emphasized that traditional trilemma of open economy is being morphed into dilemma, even with floating exchange rate domestic monetary policies seems ineffective and should be accompanied by additional controls over capital mobility. Rey (2015) calls for international cooperation

<sup>&</sup>lt;sup>7</sup> For more information about Impossible Trinity of open economies refer to Chapter 12: "The Open Economy Revisited: The Mundell–Fleming Model and the Exchange-Rate Regime" by Mankiw (2010)

among major central banks like US and European central banks to consider international

spillover effects as a result of their domestic monetary policies:

"...international financial stability and domestic activity and inflation targets may be at odds, at least in the short to medium run. Furthermore, the management of aggregate demand in systemically important economies have important consequences for economic activity in the rest of the world. This is a major consideration. The rest of the world cannot at the same time complain of excessive capital inflows due to loose monetary policy in the center countries and wish for a higher level of economic activity and demand stimulus in the same countries. Tradeoffs are extraordinarily complex and policy action will most likely remain biased towards national priorities. A transparent forum in which the collective monetary policy stance of the systemically important central banks is actively discussed and inconsistencies analyzed would reduce the risk of volatility in capital flows" (Rey 2015, p 25-26).

One of the main issues is exactly how macroprudential policies can effectively target bond market. Bond market does not exist insulated from other financial markets such as swaps and futures. More research should be done about exactly how and through which channels monetary policies can affect corporate bond market before implementing restrictions on credit inflow or anti-cyclical economic policies to avoid unwanted consequences.

### 8. Conclusion

The international bond market is a relatively new and fast growing financing channel for emerging market corporations. In this paper, I tried to analyze factors influencing nonfinancial corporate bond issuance in selected emerging markets. Findings in this paper point out the relative strength of global variables over local factors influencing nonfinancial corporate bond issuance. Without controlling for global factors, local real interest rate has statistically significant effect on quantity of bonds issued. Yet, our model suggests that when adding global variables into the picture, the significance of the local real interest rate disappears. The global factors such as the risk environment and the US real interest rate seem to explain the variation in quantity of new non-financial corporate bond issuance more than local variables. Our results are robust throughout different models, when including additional Latin American countries as well as China, and when adding bank lending as an additional control variable as well.

This topic is relatively new, so additional research with the inclusion of all emerging markets and using wider time frame might be a potential area of improvement in this topic. There are also lessons for policymakers here. Tapering with the central bank interest rate alone might not be sufficient. These policies should be accompanied with additional reforms. For example, central bank deciding to increase interest rate to cool down the corporate debt market might also consider putting additional barriers on the cross-border financial flows. This and other policy options should be carefully examined and tested before implementation due to highly interconnectedness of modern financial markets and to account for possible negative spillovers to other spheres of economy.

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