



Corporate Bond Markets: An Emerging Markets perspective

Volume II

25 September 2015

Staff Working Paper of the IOSCO Research Department

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About this Document

The IOSCO Research Department produces research and analysis on a range of securities markets issues, risks and developments. To support these efforts, the IOSCO Research Department undertakes a number of annual information mining exercises including extensive market intelligence in financial centers; risk roundtables with prominent members of industry and regulators; data gathering and analysis; the construction of quantitative risk indicators; a survey on emerging risks to regulators, academics and market participants; and review of the current literature on risks by experts.

Developments in corporate bond markets have been flagged a number of times during these exercises. In particular, the lack of data on secondary market trading and, in general, emerging market corporate bond markets, has been highlighted as an obstacle in understanding how securities markets are functioning and growing world-wide.

Furthermore, the IOSCO Board has recognized, through establishment of a *long-term finance project*, the important contribution IOSCO and its members can and do make in ensuring capital markets play a leading role in supporting long term investment in both growth and emerging and developed economies.

Thus, by providing a truly global and data-based perspective of corporate bond market development and characteristics this report aims to: (1) provide an evidence-base for further investigation into corporate bond market developments – based on trends over the last decade; (2) identify which issues and potential risks may benefit from future research; and (3) identify data gaps, particularly in emerging markets, to help guide future data collection efforts.

Executive Summary

Emerging Markets (EMEs) have risen from a string of financial crisis during the mid to late- 90s to become a driving force in the growth of the global economy. The financial sector in many EMEs has also undergone important transition – growing beyond bank-oriented roots. Many of the larger EMEs have established financial markets with global reach and even small EMEs are developing innovative financial activities.

This report focuses on one aspect of this financial sector development – corporate bond markets in EMEs. This is the second report in the IOSCO Staff Working Paper Series on corporate bond markets. The first volume focused on corporate bond markets from a global perspective. This volume zeroes in on EMEs.

Since the nature of corporate bond market development varies significantly across EMEs, a granular country and regional assessment is included. The analysis of corporate bond markets in EMEs in this report can be broken down into three main themes:

- (1) Corporate bond market development – including the nature and determinants of this development;*
- (2) Corporate bond market activity – focusing on issuance, issuer and secondary market trends;*
- (3) And risks and vulnerabilities – investigating residual and systematic risks relating to corporate bonds, such as currency mismatch risk; credit risk; roll-over risk; and liquidity risk, as well as the potential for systemic risk.*

The definition of EMEs in this report is a practical one and based on the parameters of data sources underpinning the analysis. The author recognizes that some jurisdictions included as EMEs in this report may be considered Advanced Economies (AEs) in other contexts.

(1) Corporate bond market development

- *‘Financialization’ or financial sector development in EMEs is pertinent to notions of economic growth and prosperity.*

The degree of financialization differs widely from country to country. EMEs with high financialization scores (more than 3 times their GDP) include Bermuda, Malaysia, Cyprus, Malta, China and South Korea. South Africa, Thailand, Chile, Brazil and Israel also have significant financialization scores (between 2 and 3 times the size of their GDP).

- *EME corporate bond markets are an important element of financial sector development and are getting bigger...*

EME corporate bond markets have more than tripled in size in the last 10 years, reaching \$6.9 trillion in 2014, compared to \$1.9 trillion in 2005.

- *...but are still small compared to the global debt universe.*

In comparison, and according to a report by McKinsey, total global debt (including households, corporate, government and financial) reached around \$199 trillion in 2014.

- *Even within just EMEs, corporate bond market financing continues to be dwarfed by bank and equity financing...*

Looking at the financial stock breakdown in EMEs for 2013, bank assets dominated, reaching over \$40 trillion in 2013. Growth in equity market capitalization has been flat since the onset of the

crisis in 2007 but still reached just under \$15 trillion in 2013, more than double the size of EME corporate bonds outstanding.

- ***... nevertheless growth has been solid over the last decade or so.***

The compound annual growth rate of EME corporate bond markets between 2004 and 2014 sits at around 14%.

- ***EME corporate bond markets can be split into domestic and international markets, with very different characteristics.***

Domestic corporate bond markets are defined in this report as markets with issuance from local issuers, in local currency and primarily for local investors. International corporate bond markets constitute any other type of issuance. Most of the size of EME corporate bond markets is accounted for through domestic corporate bond markets.

- ***The domestic corporate bond markets of China, South Korea and Brazil alone account for 70% of the aggregate size of EME domestic corporate bond markets.***

The domestic corporate bond markets of Turkey, Saudi Arabia, Kazakhstan, India, Russia and Nigeria have experienced the fastest growth over the last 10 years. South Korea, Malaysia and China have the deepest domestic corporate bond markets.

- ***The EMEs with the largest international corporate bond markets are South Korea, Mexico and Brazil.***

Most EMEs have fast growing international corporate bond markets, although the absolute size of these markets is small. While a few EMEs, particularly offshore financial centres such as Bermuda, Barbados and the Bahamas have relatively deep/important international corporate bond markets, most of these EME markets are shallow.

- ***Concerted policy focus could be one underpinning factor in the robust development of some EME corporate bond markets, although further study is needed to conclude this...***

In a number of cases, policy measures put in place to increase the resiliency and robustness of the financial sector in the wake of financial crises, particularly bank crises, seem to have precipitated further development of corporate bond markets. Further research in this area could confirm how and whether policy initiatives impact corporate bond market development.

- ***...other factors related to the development of corporate bond markets cover a suite of economic, financial and institutional elements.***

These factors differ depending on whether domestic or international corporate bond markets are in focus; and whether the dimension of corporate bond market development under investigation refers to the size, depth or activity. Kendall Tau correlation and fixed effects panel regression analysis is undertaken in this report to identify these possible determinants.

- ***Results from regression analysis suggest that domestic corporate bond market development is influenced predominantly by general financial development and infrastructure-based improvements in an economy...***

Domestic corporate bond market size is positively influenced by government bond market size, the number of listed companies, bank assets (% of GDP) and negatively related to a risk indicator (country risk premium multiplied by CPI). Domestic corporate bond market depth shows evidence of a positive deterministic relationship with GDP per capita and financial sector deepening.

Domestic corporate bond market activity is positively influenced by government bond market size and the bank spread.

- *...while international corporate bond market development is also related to institutional health.*

International corporate bond market size shows a positive relationship with GDP per capita, the number of listed domestic companies, and institutional quality, and a negative relationship with the bank spread and domestic financial sector deepening. International corporate bond market depth shows a positive relationship with FDI (% of GDP), the number of listed domestic companies, non-performing loans (% of total) and a negative relationship with the bank spread. International corporate bond market activity shows a positive relationship with government bond market size, GDP per capita, the number of listed domestic companies. A negative relationship is observed with the bank spread and risk indicator.

- *Additional possible determinants of corporate bond market development, requiring further analysis and data, include the impact of international credit rating services and tax treatment.*

According to available data the greater the longer international credit rating services have been available in an EME, the larger the domestic and/or international corporate bond market in that EME tends to be. Those EMEs with absent or micro markets either do not have international credit rating services available, or they have become available very recently.

Investigation and data on tax treatment of debt vs equity, corporate bonds vs loans and corporate bonds vs government bonds across EMEs may also shed further light on EME corporate bond market development.

(2) Corporate bond market Activity

- *Corporate bond market activity (issuance volume) continues to be impressive, with most issuances coming from Emerging Asia.*

Total corporate bond market activity hit \$1.06 trillion in 2014, up from \$0.9 trillion in 2013. Around 80% (\$841 billion) of this came from Emerging Asia. Nevertheless, issuances from the other regions have also experienced growth. Issuance from Emerging Americas reached \$137 billion in 2014 (13% of total EME issuance). In Emerging Middle East, issuance volume reached \$30 billion in 2014 (3%) and in Emerging Africa issuance volume reached \$6 billion. In Emerging Europe, issuance was on an upward trend but halved between 2013 and 2014, reaching \$46 billion (<1%).

- *The importance of corporate bond market activity (issuance volume over GDP) has improved on the whole across EMEs since the crisis.*

However, only in a few large EMEs is corporate bond market activity (issuance volume) greater than 1% of GDP.

- *While the majority of issuances from Emerging Europe, Middle East and Africa (EMEA) and Emerging Americas are offered on international markets (defined as being listed on more than one market), in Emerging Asia the majority of issuances are offered on domestic markets only.*

Over the last 5 years issuances from some large Emerging Asian EMEs has been almost exclusively on domestic markets. By contrast, Emerging EMEA and Americas markets have a majority of issuances on the international markets e.g. Russia, South Africa, UAE, Brazil, Mexico, Chile.

- ***The majority of EME corporate bonds over the last five years have been publicly placed, although private placement is increasing.***

Between 2010 and 2014 in Emerging EMEA, 94% of corporate bonds were publicly placed compared to 6% privately placed. In Emerging Asia, 85% of bonds were publicly placed, compared with 15% privately placed. Finally, in Emerging Americas, 88% of corporate bonds were publicly placed compared to 12% private placement. In absolute terms Emerging Asia has had the highest amount of privately placed corporate bonds of any of the regions, just shy of \$0.5 trillion of issuances, possibly partly attributable to private rebate schemes proliferating in the region.

- ***Issuer concentration is generally high across EMEs, with some notable exceptions.***

From a regional perspective, issuer concentration appears high, but to a lesser extent in Emerging Asia. In Emerging EMEA on average, the top 10 issuers in each EME account for 93% of issuances; in Emerging Americas the average is 87%; in Emerging Asia the average is much lower at 66%. In Russia, Brazil, China, South Korea, India, Thailand, Philippines and Malaysia the top 10 issuers in the country account for less than half of all issuances in that country.

- ***Issuance from non-financial firms have been surging in Emerging Asia and Americas, dominating the issuer mix in these regions...***

Since the onset of the crisis, non-financial issuance has grown at a CAGR of 18% in Emerging Americas and 30% in Emerging Asia. In 2014, non-financial issuance reached \$107 billion in the Emerging Americas and \$576 billion in Emerging Asia.

- ***...but growth in issuance from financial firms dropped off in the last few years in Emerging Americas. In Emerging Asia financial issuance dropped in 2013 but has since recovered.***

Financial issuance reached \$30 billion in Emerging Americas and \$266 billion in Emerging Asia. Since the onset of the crisis, financial issuance has grown at a CAGR of 14% in Emerging Americas, with a drop in 2012 that is yet to recover. In Emerging Asia, financial issuance has grown at a CAGR of 19%, with a drop in 2013, recovering in 2014.

- ***In Emerging EMEA, issuance from EME financial and non-financial firms dropped considerably in 2012 and 2013 respectively.***

While non-financial issuance has dominated financial issuances since 2012, in 2013, non-financial issuance plunged (alongside a drop in financial issuance). Since the onset of the crisis, the CAGR of financial issuance is -0.6% and the CAGR of non-financial issuance is -3%. In 2014, both financial and non-financial issuance equaled around \$40 billion.

- ***Looking past the financial/non-financial split, it becomes clear that EMEs with relatively large corporate bond markets exhibit higher diversity in issuer types and vice versa. Financial issuers generally feature in the top 3 issuer types across EMEs.***

Across the majority of EMEs, financial issuers appear in the top 3 dominant issuer groups. For a very small number of EMEs, financial issuers do not feature at all e.g. in Uruguay, Ecuador, Barbados, Jamaica, Venezuela, Bangladesh, Laos, Macao, Marshall Islands, Croatia, Pakistan, Estonia, Lithuania, Serbia, Slovak Republic and Togo. From a regional perspective, the top three issuer types across Emerging Americas are: Finance, Oil & Gas and Telecommunications; in Emerging Asia they are Finance, Construction/Building and Utility & Energy; In Emerging EMEA they are Finance, Oil & Gas and Utility & Energy.

- ***Most of the corporate bond issuance from EMEs has an investment grade (IG) rating. High yield issuance has been subdued since the onset of the crisis.***

All EME regions have shared a general upward trend in IG issuance over the last decade and a half. In 2014, IG issuance reached \$799 billion in Emerging Asia, \$106 billion in Emerging Americas and \$65 billion in Emerging EMEA.

High yield issuance has also been on a general upward trend in EMEs over the last decade and a half. However, in total, high yield issuance from EMEs reached less than \$100 billion in 2014. At the regional level, the level of high yield issuance hit \$43 billion in Emerging Asia and \$31 billion in Emerging Americas. In Emerging EMEA, high yield issuance reached just \$17 billion.

- ***While issuance from EMEs is mostly for purposes other than refinancing, there has been a surge in refinancing (or similar) issuance since the crisis, with the exception of Emerging Americas.***

In Emerging Asia, refinancing issuance reached an all-time high of \$221 billion in 2014. In Emerging EMEA before the crisis, issuance for refinancing purposes was negligible but after the onset of the crisis, issuance picked up somewhat reaching \$9 billion in 2014. EMEs in Emerging Americas are the exception. Before the crisis refinancing issuance was growing in volume but dropped off substantially after 2007, reaching a value of \$27 billion in 2014.

- ***The majority of issuance from Emerging EMEA and Emerging Americas is in non-local currencies. The majority of issuance in Emerging Asia is in local currencies.***

In 2014, local currency issuance in Emerging EMEA reached \$20 billion and non-local currency issuance reached \$61 billion. In Emerging Americas local currency issuance reached \$39 billion and non-local currency issuance reached \$98 billion. In Emerging Asia, local currency issuance reached a high of \$673 billion, while non-local currency issuance equated to less than one sixth of that at \$129 billion.

- ***In Emerging Asia, the high volume and growth in local currency issuance is driven by China.***

In the region itself, there is a fairly even split between those EMEs with stronger local currency markets and those with stronger non-local currency markets.

- ***US dollar denominated (USD-denominated) issuance from EMEs has grown in absolute terms but remains relatively small. Growth, as a proportion of total issuance, has been flat.***

In 2014, most of the USD-denominated bonds came from Emerging Asia, reaching \$150 billion. In Emerging Americas, issuance reached \$85 billion. Issuance was much smaller across the other regions, reaching just over \$20 billion in Emerging Middle East, \$15 billion in Emerging Europe and \$5.5 billion in Emerging Africa. As a proportion of total issuances, USD-denominated bond issuance has been flat, except in Emerging Africa. Nevertheless the proportion is still high in some regions, reaching more than 50% of total issuances in Emerging Middle East, Emerging Americas and Emerging Africa.

- ***In most of the regions, USD-denominated issuances come from Finance, Oil & Gas and Utility & Energy. However in China, USD-denominated issuances from real-estate/property are significant and mostly high yield.***

In China, the total value of USD- and Euro-denominated bond issuances from the real-estate/property sector between 2010 and 2014 reaching \$61 billion. Real Estate/Property constitutes the 2nd largest issuer group of USD-denominated bonds in China in that period. In 2014 alone, USD-denominated bond issuance from the real-estate/property sector reached around \$20 billion. The majority of this issuance is high yield – in 2014, around 60% of these issuances were high yield.

- ***After the onset of the crisis, callable issuances continued a growth path in Emerging Americas and Emerging Asia, but flattened in Emerging EMEA.***

In Emerging Americas, issuance of callable bonds from EMEs reached \$80 billion in 2014. In Emerging Asia, issuance of callable bonds spiked to \$185 billion in 2014. In Emerging EMEA issuance of callable bonds is on the decline reaching \$16 billion in 2014.

- ***Putable bond issuances increased substantially after 2007 in Emerging Asia and Emerging EMEA. There has been negligible issuance from Emerging Americas.***

EMEs in Emerging Asia issued \$36 billion worth of putable bonds in 2014. EMEs in Emerging EMEA issued just shy of \$20 billion worth of putable bonds in 2014. EMEs in Emerging Americas issued no putable bonds in 2014.

- ***Issuance of Sukuk bonds is also picking up in Emerging Asia and Emerging EMEA.***

In 2014, Sukuk issuance reached \$11 billion in Emerging Asia and \$12 billion in EMEA. Malaysia, Saudi Arabia and the United Arab Emirates are the largest issuers of these types of bonds.

- ***Bonds issued from EMEs to finance infrastructure projects have fallen since the peak of 2009.***

In 2009, issuance in Emerging Asia spiked, mainly driven by spending in China with issuance volume reaching \$49 billion. By 2014, issuance from Emerging Asia was less than \$3 billion. In Emerging Americas, issuance of these types of bonds has increased slightly, overtaking issuances from Emerging Asia to reach over \$5 billion in 2014.

- ***The liquidity and trading activity of EME corporate bonds on US and European secondary markets, based on available data, appears to vary significantly from region to region and country to country.***

Using data provided by MarketAxess on trading volumes of EME bonds on US and European secondary markets reveals divergence across EMEs when it comes to bond turnover ratios and general secondary market activity.

- ***Over the last four years, the ratio of trading activity of EME corporate bonds on EU and US secondary markets to outstanding has been flat, except for in Emerging Americas where it is increasing.***

From a regional perspective, and based on available data, secondary market trading volume of EME bonds on US and European secondary markets is larger than the total outstanding of corporate bonds in Emerging Americas, around the same size in EMEA but much smaller than the outstanding in Emerging Asia. The low ratio in Emerging Asia may be due to lack of data around secondary market trading on local Asian secondary markets, especially considering that there are restrictions on trading of domestic securities on foreign markets in some Asian EME jurisdictions.

Risks and Vulnerabilities

- ***Growing corporate bond markets may represent financial deepening in EMEs, with plenty of associated benefits. At the same time, the rate of growth, especially in the context of macro-economic and political developments at the global scale may expose vulnerabilities.***

These vulnerabilities may manifest through currency mismatch risk and credit risk; roll-over risk; and secondary market liquidity risk. Individually, these risks do not necessarily imply systemic risk. However, these risks can also interact with each other. Triggering factors may include developments such as falling commodity prices, appreciation of hard currencies (e.g. USD), hike in interest rates in the developed world; and the bursting of asset bubbles (e.g. in the real estate

sector). These vulnerabilities may have far-reaching implications at the country-level, especially when taking into account other macro-economic factors.

- ***However, a closer, more granular look at the data suggests that, at least currently, the potential for the identified vulnerabilities in emerging market corporate bond markets to amount to global systemic risk is not immediately apparent. Yet, EME financial markets still face risk, including from reversal of capital flows and slowing growth, which may have spillover impacts on the bond market.***

Taking four scenarios under investigation, reveals that the value of corporate bond issuance in EMEs vulnerable to the risks mentioned above are relatively small, compared to the total EME corporate bond universe.

- ***Scenario (1): The strengthening US dollar and currency mismatch risk.*** Between 2010 and 2014, \$1 trillion of the \$4 trillion EME issuances were USD-denominated. However 30% of the USD issuance came from EMEs which have currencies pegged to the USD, use the USD as a substitute currency or use the USD as an alternate currency. Of the remaining 70%, around \$527 billion (75%) appears to have come from non-export oriented industries. Export-oriented industries tend to have a natural hedge against currency risk (and may even benefit) since firms normally earn revenues in hard currencies. This suggests that, of the \$1 trillion in USD issuances from EMEs between 2010 and 2014, only half of this issuance is most vulnerable to currency mismatch risk in the context of a strengthening USD. Nevertheless, recent developments in emerging market currencies, including in China, suggest that even pegged currencies may still be somewhat vulnerable.

- ***Scenario (2): Falling commodity prices and credit risk.*** Between 2010 and 2014, \$3.3 trillion of corporate bonds were issued from a comprehensive sample of commodity issuer type, a significant proportion. Difficulties in servicing debt in the event of falling commodity prices are more pronounced for high yield issuers. However, across the EMEs under investigation, only around 10% of commodity issuance from the sample is high yield (\$331 billion between 2010 and 2014), a relatively small volume. Of note is the interaction of this risk factor with the appreciation of the US dollar. Commodity industries tend to be export-oriented and the appreciation of the dollar may actually be a net positive, given that a large number of commodities are priced in USD.

- ***Scenario (3): Roll-over risk exacerbated by falling commodity prices.*** Dwindling commodity prices may hit the earnings of a group of issuers making it difficult for them to rollover their debt. In the next three years (2015 to 2017) around \$229 billion worth of issuances from a selection of these sectors is set to mature. In the next six years (2015-2020) around \$456 billion worth of issuances are set to mature. Around half of these issuances set to mature over the next three and six year period come from China. For most of the other EMEs, maturity volumes from these selected sectors is less than \$7 billion over the next three years and less than \$10 billion in the next six year

- ***Scenario (4): Roll-over risk exacerbated by strengthening US dollar.*** Strengthening of the US dollar may exacerbate roll-over risk for USD-denominated issuances from EMEs, specifically those that may not have a natural hedge (e.g. export-oriented). In the next three years \$268 billion USD-denominated issuances from non-export oriented issuers are set to mature across all EMEs. In the next six years \$593 billion are set to mature. Just \$180 billion of EME issuances in USD from non-export-oriented industries and from countries whose currencies are not pegged to or substituted by the

USD will mature - \$370 billion in the next six years. Of the \$180 billion, 22% come from South Korea, 18% come from Russia, 13% come from Brazil, 8% from India and 8% from Mexico and 4% from Turkey.

This analysis does not suggest that EMEs do not face risk. Triggering events such as slowing growth in EMEs, a reversal of capital flows and general negative investor sentiment may impact the ability of EME firms to find financing, including through bond markets, hindering their ability to continue and grow operations, with further impact on economic growth.

- ***The interaction with liquidity risk is also not so clear-cut.***

A concern from a systemic risk perspective is that triggering events affecting corporate debt, along the line of what was described in the above scenarios, combined with an illiquid secondary market could have potential implications for financial stability.

However, liquidity conditions facing EME bonds vary significantly. Of the EMEs identified as having 'vulnerable' bond issuance through the scenario analysis, there is an even split between those with declining and those with increasing bond turnover ratios on US and European secondary markets over the last four years.

- ***Discussions of risks emanating from EME 'corporate debt' may require a shifting away from treating EME corporate debt as a homogenous source of risk.***

Further research on risks and vulnerabilities will need to recognize the diversity across EMEs and requirement for more granular, country-level and even firm-level assessment.

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Chapter 1 – Introduction

Emerging market economies (EMEs) have risen from a string of financial crisis during the mid to late-90s to become a driving force in the growth of our global economy. EMEs play a major role in export and trade, some have sizable foreign exchange reserves, and most are experiencing significant population growth.

The financial sector in many EMEs has also undergone important transition – growing past their bank-oriented roots. Many of the larger EMEs have established financial markets with global reach and even small EMEs are seeing burgeoning and often innovative financial activities.

This report focuses on one aspect of this development – corporate bond markets in EMEs. Since the nature of this development varies significantly across these markets, a granular country and regional assessment is included.

The modern corporate bond markets first thrived and grew in the United States (US) in the early-twentieth century (despite the recession of the 1930s), shifting from a primary retail oriented market to a decidedly institutional one, and constituting a major financing channel for US firms.²

Nevertheless, while sizeable corporate bond markets have also developed in other advanced economies (AEs) since the 1980s,³ the banking segment has traditionally and, in many cases, still dominates the corporate financing mix in other parts of the world,⁴ including EMEs. However, this dynamic shows evidence of change in recent years with the growing importance of securities markets as a financing channel.⁵

This report is the second volume of an IOSCO staff research series looking into the development of corporate bond markets globally. The first volume (*Corporate Bond Markets: A Global Perspective*)⁶ was released April 2014 and presents a range of global trends, developments and challenges related to corporate bond markets and in the context of our larger financial system. The first volume highlights the importance of corporate bond markets in financing the real economy, noting that *“corporate bond markets can... be considered an important ingredient in economic growth, financial stability and economic recovery, particularly in the wake of the crisis.”* This volume of the report series focuses specifically on EMEs.

What are corporate bonds?

Broadly, markets for corporate bonds may be separated into **primary markets**, where cash or capital is borrowed by issuers and lent by bond purchasers, and **secondary markets**, where bond contracts are traded among broker-dealers and investors. Corporate bonds may be secured or unsecured, and can be used to either invest in a corporation’s business activities or to refinance existing debt.⁷

² Sidney Homer, “The Historical Evolution of Today’s Bond Market”, *Explorations in Economic Research*, vol 2, no. 3, 1975

³ Financial liberalization in Japan in the 1980s; the Big Bang reforms in the UK in the 1990s; creation of the European single market.

⁴ An Anatomy of Corporate Bond Markets: Growing Pains and Knowledge Gains”

⁵ See Rohini Tendulkar, “Corporate Bond Markets: A Global Perspective”, IOSCO Staff Working Paper, 2013

⁶ Rohini Tendulkar, “Corporate Bond Markets: A Global Perspective”, 2014

⁷ Islamic bonds are another form of corporate bond, also known as Sukuk. These are Shariah-compliant bonds that do not involve interest payments. They have become an increasingly popular form of market-based financing, with Sukuk issuance increasing by a cumulative annual growth rate of 44% from 2004 to 2011 (See Sukuk report, pg 8). In the first half of 2012, issuance levels reached US \$66,4 billion. However, for the purposes of simplifying and expediting the presentation of this report, a detailed analysis of Sukuk has not been undertaken here. For further information, see *Disclosure Requirements for Islamic Capital Markets Products* (the joint IOSCO-IFSB-Securities Commission Malaysia report, released 2013), the IOSCO 2013 *Risk Outlook*, and the IOSCO Statistics Web Portal (<http://www.iosco.org/research/?section=statistics>).

Coupons, maturities, issue amounts, credit ratings, and contractual features vary widely across different issues. Corporate bonds may be classified as investment grade (IG) or high yield (HY), and sophisticated investors may use derivatives products (such as CDS, FX swaps and bond futures) to hedge against the risks associated with different bonds. The level of risk associated with a bond is also assessed in the marketplace by the yield it offers over a benchmark (usually the US Treasury yield curve). Low yields are usually associated with low risk, IG products, while higher yields are usually associated with higher risk, HY products.

Corporate bond market activity is appealing for issuers, investors and governments alike (see Table 1).

Table 1: Benefits Associated with well-developed corporate bond markets

<p>From an issuer's perspective:</p>	<ul style="list-style-type: none"> • Corporate bonds provide a cheap, stable and reliable source of funding for new projects, innovation and business expansion; • They are a flexible source of funding – bonds can be issued at different times, and with different maturities, coupons and terms, according to changing business needs and market conditions; and • They can provide financing for long-term investment.
<p>From an investor's perspective:</p>	<ul style="list-style-type: none"> • Corporate bonds offer a relatively stable income stream, bearing a fixed or floating coupon to a specified maturity date; • They allow appropriate management of currency mismatches, and provide an opportunity for investors to diversify their portfolios, facilitating risk management; and • In the current low rate environment, they offer an attractive spread over bank deposits and other 'safe haven' assets, without the volatility associated with equities. Bondholders also receive preferential treatment in the case of default.
<p>From a policy and regulatory perspective:</p>	<ul style="list-style-type: none"> • Corporate bond markets are becoming increasingly global, facilitating the efficient matching of issuers and investors across borders, while reducing costs of intermediation; • They reduce dependence on bank lending; • They can provide a source of long-term investment financing; • Local currency corporate bond markets can reduce the impact of volatile capital flows on EMs, supporting global financial stability.⁸

Source: compiled from ICMA, 'Economic Importance of Corporate Bond Markets', March 2013

[Related IOSCO Work](#)

For these benefits to be realized, markets should function soundly and efficiently. Accordingly, as part of IOSCO's mission and objectives,⁹ member regulators agree to monitor, regulate and develop corporate bond and other securities markets, while:

- Protecting investors;
- Ensuring markets are fair, efficient and transparent; and
- Reducing systemic risk.

⁸ IMF, EBRD, OECD, "Local Currency Bond Markets – A Diagnostic Framework", July 2013

⁹ IOSCO Objectives and Principles of Securities Regulation

In 2011, IOSCO's Growth and Emerging Markets Committee (formerly the Emerging Markets Committee) released a joint IOSCO-World Bank report exploring the development of emerging market (EM) corporate bond markets.¹⁰ The report noted the potential for significant growth in EM corporate bond markets, but also highlighted that corporate bond markets remained underdeveloped in many EMs, particularly relative to bank credit and equities markets.

In addition, in 2004 IOSCO published a report investigating corporate bond market transparency.¹¹ This report recognized the importance of corporate bond markets to the real economy, but also identified the need for sound market development, to ensure transparency and appropriate risk management. The absence of a complete and comparable dataset on corporate bond markets (especially secondary markets) across the world's regions was acknowledged as an obstacle to market development and understanding market development in both reports.

As a result, in 2013 IOSCO launched a project on *Long-Term Investment Financing* (LTIF), aiming to identify how members can ensure that capital markets (including corporate bond markets) play a leading role in supporting long-term investment in both Mature and Growth and Emerging Markets. IOSCO has also launched a *data gathering project*, aiming to address the severe shortage of data on securities markets in EMs. Some of the data gathered in the latter project has been used to feed into this report. Finally, IOSCO has been involved in a number of outreach activities, including workshops and seminars, aimed at promoting understanding of corporate bond markets globally.

[Purpose of this Report Series](#)

Much existing research in the securities markets space has focused on the role of equities markets (primarily due to the availability of data), but as emphasized, corporate bond markets are also a key source of securities markets funding. As part of IOSCO's focus on LTIF and Emerging Markets data gaps, and in order to build on previous IOSCO work regarding corporate bond markets, this report series provides an up-to-date perspective on trends in emerging markets since 2000 (where data allows), and identifies particular case studies and developments that may be relevant from a systemic risk, market development and/or investor protection perspective.

Importantly, this report series provides a descriptive and data-driven analysis of corporate bond markets, on a global, regional and country-by-country basis, and identifies any significant data gaps. The report series is divided into three volumes.

Volume I (global), (published) provided the current global context and a broad view of trends in global corporate bond markets, comparing developed and emerging markets.

In recognizing the heterogeneity within developed and emerging market countries, this volume, **Volume II** provides more granular, country-by-country data and analysis, exploring trends for groups of emerging market countries. **Volume III** will do the same for developed markets.

In all three volumes, a number of breakdowns and indicators are used to provide descriptions of bond market characteristics, trends and development. Each volume also concludes with identification of some potential issues and risks and present suggestions for further research.

¹⁰ IOSCO/World Bank, 'Development of Corporate Bond Markets in the Emerging Markets', Emerging Markets Committee, November 2011 [<http://www.iosco.org/library/pubdocs/pdf/IOSCOPD360.pdf>]:

¹¹ IOSCO, 'Transparency of Corporate Bond Markets', 2004 [http://www.cnmv.es/publicaciones/IOSCO_mercados.pdf]

Chapter 2 – Methodology

IOSCO has a diverse membership covering developed countries and growth and emerging markets. Corporate bond market trends and characteristics can differ significantly both within and between these categories. As such, data has been gathered and assessed at the aggregate level (published in Volume I of this report series) as well as individually for a number of EMEs.¹²

The methodology described in this chapter applies to this Volume (Volume II) of the report series only.

Structure

Chapter 2 outlines the methodology used to compile and analyze the available data and to overcome data limitations, incomparability issues and some sweeping data gaps. It also presents the indicators underpinning the analysis of market size and development, importance and activity across jurisdictions.

Chapter 3 looks closer at the levels of financialization and corporate bond market development across EMEs and investigates factors to consider in the development of corporate bond markets, specifically in emerging markets. Domestic and international corporate bond market size, depth and growth are compared across EMEs. Regression and correlation analysis is also used to identify the relationship between a host of economic, financial and institutional factors and the development of corporate bond markets.

Chapter 4 presents an overview of issuance, issuer and secondary market trends in emerging market corporate bond markets over the last decade or so, based on available data.

Chapter 5 investigates some potential risks and vulnerabilities facing or arising from EME corporate bond markets.

Chapter 6 concludes by identifying data gaps and areas for further research.

What constitutes ‘Emerging Markets’ in this report?

The list of EMEs under investigation has been selected based predominantly on (comparable) data availability. The definition of EMEs in this report is a practical one and based on the parameters of data sources used to underpin the analysis in this report. The EMEs include both advanced-emerging, emerging and frontier economies. Nevertheless, for some of the countries in the sample, a full set of corporate bond markets data is not available. The author recognizes that some of the jurisdictions included in this definition may be considered AEs in other context.

For different sections of analysis in this report, a slightly different sample of EMEs has been used. This is due predominantly to data gaps and different definitions underpinning the different data sources used in constructing this report. In general, data relating to stock measures (e.g. corporate bonds outstanding) uses a smaller data set due to data gaps. Flow measures (e.g. corporate bond issuance trends) use a larger data set. The larger data set in the latter case is due to the wider scope of data available through the primary data source on flow measures, underpinning this report, and the parameters set for defining ‘emerging markets’ within this data source. This pre-defined parameter means that some economies that are considered AEs are included in the data for issuance volume, unless otherwise stated. The regression and correlation analysis also uses a smaller

¹² These jurisdictions were selected on the basis of the availability of complete and comparable data.

dataset, based on the availability of data to run the regression. The sample is defined in the body of the report.

Table 2 provides a list of the 81 EMEs in the dataset underpinning this report. Those EMEs in red denote EMEs included in figures for flow measures (e.g. issuance volume) but not stock measures (e.g. outstanding). Those EMEs in green denote those EMEs included in the stock measurement but not flow measurement.

Table 2: Countries in the dataset

Argentina	Azerbaijan	The Bahamas	Bahrain	Bangladesh	Barbados
Belarus	Bermuda	Botswana	Brazil	Bulgaria	Chile
China	Columbia	Costa Rica	Croatia	Czech Republic	Dominican Republic
Ecuador	Egypt	El Salvador	Estonia	Ethiopia	Ghana
Georgia	Greenland	Guatemala	Hungary	India	Indonesia
Guatemala	Hungary	India	Indonesia	Israel	Jamaica
Jordan	Kazakhstan	Kenya	Kuwait	Kyrgyzstan	Laos
Latvia	Lebanon	Lithuania	Liberia	Malta	Mauritius
Macao	Malaysia	Marshall Islands	Mexico	Mongolia	Morocco
Nigeria	Oman	Pakistan	Panama	Paraguay	Peru
Philippines	Poland	Puerto Rico	Qatar	Romania	Russian Federation
Saudi Arabia	Serbia	Slovak Republic	Slovenia	South Africa	South Korea
Sri Lanka	Chinese Taipei	Thailand	Togo	Trinidad and Tobago	Tunisia
Turkey	Ukraine	United Arab Emirates	Uruguay	Uzbekistan	Venezuela
Vietnam	Hong Kong	Singapore			

For this volume, the author first adopted a descriptive, exploratory approach: Collecting all available (comparable) data, performing a literature review and media analysis and developing indicators (see [Annex X](#) for list) to interpret the collected information.

Based on the outcomes of this step, the author employed regression analysis; trend analysis; literature review; and sought correlational relationships for corporate bond market characteristics within and between the analyzed countries. A number of indicators have been developed and/or used to outline global fixed income market conditions, identify global trends, and compare conditions in EMEs.

The data presented in this report series is disclosed on a historical period of approximately 2000-2015 Q1. The exact period used for each indicator, however, depends on specific data availability and is therefore not consistent across the whole report series.

Caveats

The dataset for corporate bond market size (total outstanding) has been synthesized from a number of internal and external data sources including BIS, Dealogic, Local authority data sources and an internal data gathering exercises in IOSCO. Corporate bond market size is split into domestic and international issuance.¹³ All countries included have at least two data points between 2000 and 2014. However, a complete time series of data does not exist for all the EMEs under investigation.

The datasets for institutional, financial and economic conditions used in the correlation and regression analysis come from a number of sources (outlined in Annex B). Again a complete time series of data for each of these indicators does not exist for all of the EMEs under investigation. Information on the provision of credit rating activities for corporate bonds across a number of EMEs was kindly provided by Moody's.

The datasets on corporate bond market activity, issuance and issuer trends come primarily from Dealogic.

The dataset on secondary market activity was provided by MarketAxess (US secondary market data from TRACE and MarketAxess, European secondary market data from Trax, a subsidiary of MarketAxess). The secondary market activity reported refers only to the traceable trading of EME bonds on US and European secondary markets and does not include trading activity on domestic markets. Since the dataset is not comprehensive, conclusions and interpretations of the data are subject to change as more data becomes available. This data is supplemented with bond turnover and trading activity indicators from the Asian Development Bank.¹⁴

Indicators, charts and graphs have been developed by the author, unless otherwise indicated.

Groupings and selected jurisdictions do not necessarily, and are not intended to, reflect judgment on current international boundaries. They are not based on recognized country-level or region-level delineations.

Availability of data varies considerably from country to country. In some cases data has had to be annualized or extrapolated from whatever data is available, in order to provide some insight on corporate bond market development in certain countries. In cases where this occurs, assumptions are mentioned alongside the presentation of the data.

¹³ This split is based on the BIS definition of domestic vs international outstanding. As such, there may be some overlap between the two groups.

¹⁴ Asian bonds online

Chapter 3 – Corporate Bond Market Development in Emerging Markets

Corporate bond market development varies considerably from EME to EME.¹⁵ Thus, in order to lay a basis for the exploration of trends in corporate bond markets for this report, the sections of this chapter present a number of perspectives on the nature of corporate bond market development across these economies:

- (1) Financial development and financialization of EMEs is explored, as is the historical context of corporate bond market development;
- (2) EME corporate bond market growth (2005-2014), size (as of 2014 or latest data) and depth (amount outstanding as a % of GDP) is compared to allow for a loose categorization of EMEs in terms of their corporate bond market development level;
- (3) Findings are presented from correlation and regression analyses conducted to identify determinants of corporate bond markets development in EMEs;
- (4) Lastly, additional determinants of corporate bond markets are explored.

3.1 Financial development in EMEs

✧ *Financial sector development in EMEs is pertinent to notions of economic growth and prosperity. High levels of financial development correlate with economic autonomy and opportunities, access to education, social mobility and income distribution.¹⁶ In a study by Cihak et al, it is suggested that “economies with higher levels of financial development grow faster and experience faster reductions in poverty levels.”¹⁷*

This financial development can be measured as the growth of the financial sector relative to GDP – an indicator of ‘financialization’. As a concept, financialization is linked to the “increasing role of financial motives, financial markets, financial actors and financial institutions in the operation of the domestic and international economies.”¹⁸

For EMEs today, the degree of financialization differs widely from country to country.

Figure 1 displays a heat map measuring the degree of financialization across EME regions.¹⁹ The map clearly shows not only how the level of financialization differs between EMEs but also how EMEs with high levels of financialization tend to be concentrated in certain regions. In particular, EMEs in the Asia region tend to rank higher on the financialization index. Nevertheless, from a country-level perspective, the EMEs with the highest financialization score (higher than 3 times the size of GDP)

¹⁵ Martin Cihak, Ash Dermiguc-Kunt, Erik Feyen, Ross Levine, “Benchmarking Financial Systems Around the World, *Policy Research Working Paper*, World Bank, August 2012

¹⁶ *ibid*

¹⁷ *ibid*

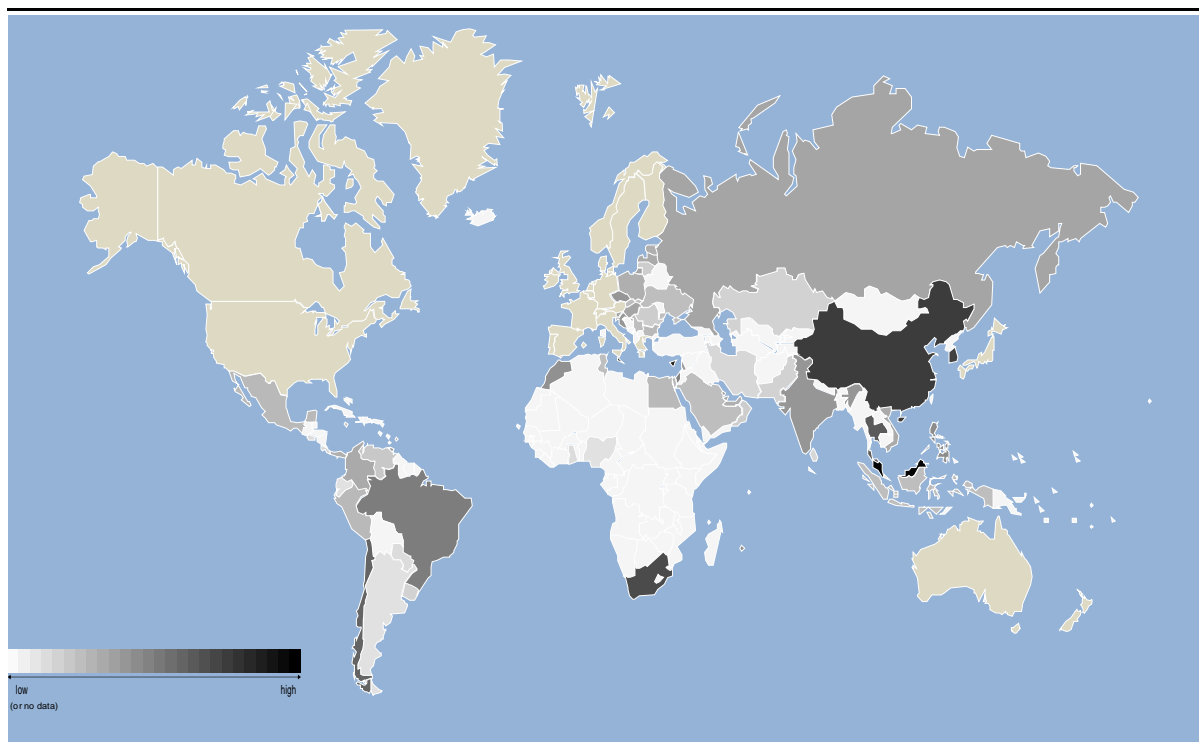
¹⁸ Gerald A. Epstein, “*Introduction: Financialization and the World Economy*”, PERI, 2005

¹⁹ For the purposes of this report, financialization is approximately measured through the use of an index (sum of bank assets, corporate bonds outstanding, equity market capitalization all over GDP).

are Bermuda, Malaysia, Cyprus, Malta, China and South Korea. South Africa, Thailand, Chile, Brazil and Israel also have significant financialization scores (between 2 and 3 times the size of their GDP). Of the EMEs in the dataset, those with the lowest score are Ecuador, Argentina, Nigeria, Paraguay and Ghana (all with scores less than half of their GDP).

Figure 1: EME financialization index heat map

Financialization index heat map - EMEs only



Source: constructed by IOSCO Research Department based on data from Helgilibrary (bank assets, in cases where data is not complete, data is extrapolated from available data to produce figure for 2013); IMF (GDP); World Bank (Equity market cap); BIS, Dealogic, internal IOSCO data collection exercises, local authorities (corporate bonds outstanding).

Note: Data as of 2013

Note: AEs noted in brown – data not included in heat map.

Corporate bond markets are an important factor of financialization. However, in EMEs, firms have traditionally relied on not only bank funding but also family ties, government funding and/or cross-border aid to support development. In some cases, this financing mix has precluded an immediate need for a developed corporate bond market.²⁰

A large banking system is still the driving force for financing in Asia. A report from Deutsche Bank²¹ points out that the high level of domestic savings in Asia provides banks access to deposits to feed into their lending. Furthermore, the report notes how factors such as incomplete information on issuance track records for firms; and the emphasis on ‘relationship based lending’, support this financing structure.

In Latin America, while financial markets have been tapped at the international level, the banking sector still dominates as a financing source at the domestic level.²² In the Gulf region, hydrocarbon

²⁰ O Janet Adelegan and Bozena Radzewicz-Bak, “What Determines Bond Market Development in sub-Saharan Africa?”, IMF Staff Working Papers, September 2009; “Bond Markets: A Spare Tire for the Domestic Financial System”, IADB, May-August 2006; Deutsche Bank, “What’s behind recent trends in Asian corporate bond markets”, *Current Issues*, January 31 2014

²¹ Deutsche Bank, “What’s behind recent trends in Asian corporate bond markets”, *Current Issues*, January 31 2014

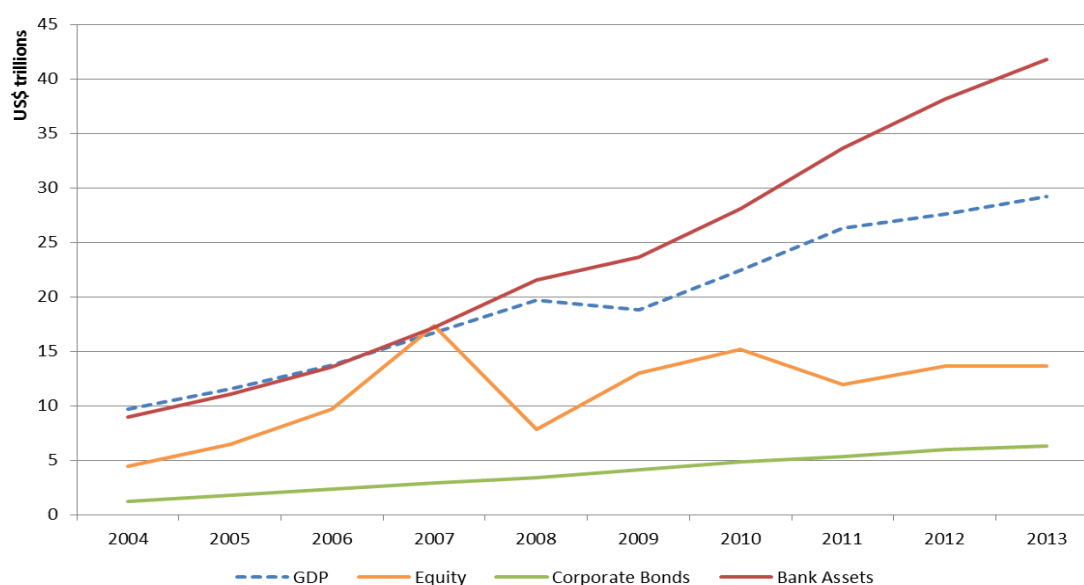
²² “Bond Markets: A Spare Tire for the Domestic Financial System”, IADB, May-August 2006

production and export has provided sufficient liquidity in the past.²³ In Africa, EMEs have had access to foreign bank loans and also been supported by external grants and concessional loans.²⁴ Finally, Emerging Europe mirrors the rest of Europe in that bank lending provides the majority of corporate financing. As a result, corporate bond markets in EMEs are generally considered small and illiquid, compared to the financing offered through the banking sector.

Figure 2 confirms this reality by presenting a breakdown of the aggregate EME financial stock (bank assets, equity market capitalization and corporate bonds outstanding). Bank assets dominate the financing stock, reaching over \$40 trillion in 2013, higher than the combined EME GDP, which reached just under \$30 trillion. Equity market capitalization reached just under \$15 trillion and growth had been relatively flat since the onset of the crisis in 2007. Corporate bonds outstanding has been growing steadily, although total size is still smaller than both bank assets and equity market capitalization, reaching just \$6.3 trillion in 2013.

This suggests that while corporate bond markets in EMEs have achieved significant growth over the last 10 years, further nurturing of development is needed before they can be said to constitute a major financing channel in EMEs.²⁵

Figure 2: EME financial stock breakdown



Source: Bank Assets derived from Helgilibrary; Equity (market cap) derived from World Bank; GDP (current US\$) from IMF; Corporate bonds outstanding from IOSCO research department calculations based on data from BIS, ABO, ECB, Dealogic, IOSCO internal data gathering exercises and local authorities

Note: EME countries included are Argentina, Bahrain, Barbados, Bermuda, Brazil, Bulgaria, Chile, China, Columbia, Costa Rica, Croatia, Cyprus, Czech Republic, Ecuador, Egypt, El Salvador, Estonia, Ghana, Hungary, India, Indonesia, Iran, Israel, Jamaica, Kazakhstan, Kuwait, Latvia, Lebanon, Lithuania, Malaysia, Malta, Mauritius, Mexico, Morocco, Nigeria, Oman, Pakistan, Panama, Paraguay, Peru, Philippines, Poland, Qatar, Romania, Russia, Saudi Arabia, Serbia, Slovakia, Slovenia, South Africa, South Korea, Sri Lanka, Thailand, Trinidad & Tobago, Tunisia, Turkey, Ukraine, United Arab Emirates, Uruguay, Venezuela, Vietnam.

Note 2: Data for Bank Assets is not complete for all countries. In some cases data has been extrapolated across the time series.

A paper by the IOSCO Growth and Emerging Markets Committee, released in 2010, complements this finding noting that *“Corporate bond markets in [emerging markets] are at various stages of development, and tend to be relatively nascent and untapped in many [emerging markets]. Other*

²³ Martin Hvidt, “Economic Diversification in GCC countries: Past record and future trends”, Kuwait Programme on Development, Governance and Globalisation in the Gulf States, London School of Economics and Political Science, no. 37, January 2013

²⁴ Yibin Mu, Peter Phelps, and Janet G Stotsky, “Bond Markets in Africa”, IMF Staff Working Papers, January 2013

²⁵ “Development of Corporate Bond Markets in the Emerging Markets”, IOSCO 2010; World Economic Forum, Boston Consulting Group, “Redefining the Emerging Market Opportunity”, Chapter 4: The Opportunity in Corporate Bonds, 2012

*prevalent characteristics include limited quality bond offerings, small issuance size and lack of liquidity in the secondary markets.”*²⁶ Further study into the development and nature of corporate bond markets in EMEs, and possible factors underpinning this development, is thus a useful exercise – particularly since well-developed corporate bond markets can accrue specific benefits for an economy. Corporate bond markets can fuel infrastructure spending,²⁷ diversify economies, provide insulation from banking crisis and sovereign default risk,²⁸ and support complex funding needs as economies and firms mature.²⁹

²⁶ Growth and Emerging Markets Committee, “Development of Corporate Bond Markets in the Emerging Markets”, IOSCO, 2010

²⁷ American Funds, Capital Guardian, “Emerging Markets Debt: Local and dollar bonds provide different routes to returns”, Viewpoints, February 2013

²⁸ Franklin Allen, Elena Carletti, Jun Qian, Patricio Valenzuela, “Financial Intermediation, Markets, and Alternative Financial Sectors”

²⁹ World Economic Forum, Boston Consulting Group, “Redefining the Emerging Market Opportunity”, Chapter 4: The Opportunity in Corporate Bonds, 2012

3.2 Understanding the regional context of corporate bond market development

✧ *EMEs are situated within different world regions. Within these regions, certain historical, cultural and policy factors come together to form a basis for financial market development – including the development of corporate bond markets. In general, corporate bond markets in Asia are the largest, followed by those in Latin America and then Europe, Middle East and Africa.*

One interesting pattern concerns EME responses to regional financial crises. In a number of cases, policy measures put in place to increase the resiliency and robustness of the financial sector in the wake of these crises has laid the foundations for the further development of corporate bond markets.

- *Emerging Asia*

In Asia, the Asian financial crisis of the late 90s “prompted calls for the development of financial markets, and particularly local currency bond markets, to reduce exposure to the currency mismatch problem in the future”.³⁰ Individual Asian EMEs have focused on measures to increase the efficiency, transparency and functioning of both primary and secondary corporate bond markets. A report by the IADB provides some examples including: the bond information dissemination system in Malaysia, reporting requirements for traders by the Thai Bond Market Association and reporting requirements for dealers by the Korea Security Dealers Association.³¹

Initiative at the country level has grown into a push to build efficient, functioning corporate bond markets through pooling resources at the regional level. In fact, regional initiatives have been in place since the beginning of last decade, aimed at nurturing domestic and cross-border corporate bond markets.³² Since then, corporate bond markets in Asia have been buoyed by ‘pull’ and ‘push’ factors such as strong fundamentals, expanding demand, sovereign creditworthiness and low interest rates in AEs.³³ Corporate bond markets in Asia are now used in the financing of both SMEs and larger conglomerates; and for private and government (e.g. state-owned firms) projects.³⁴

- *Emerging Americas*

In Latin America, prior to the turn of the century, financing through capital markets relied heavily on international markets and domestic banks. Expensive registration processes, unreliable macro-economic conditions, absence of demand and supply factors and regulatory restrictions all contributed to suppressing the development of corporate bond markets prior to the 1990s.³⁵ However, the debt crisis in the early 1980s in Mexico and Uruguay kick-started government bond markets, a prerequisite for creating a benchmark yield curve for a local corporate bond market.³⁶ In the mid-1990s, the Tequila Crisis cut off access to international markets.³⁷ By this time, small domestic bond markets existed, but they were short-term and denominated in US dollar, which

³⁰ Paul Mizen and Serafeim Tsoukas, “What promotes greater use of the corporate bond market? A study of the issuance behavior of firms in Asia”, *Oxford Economic Papers*, December 2013

³¹ “Bond Markets: A Spare Tire for the Domestic Financial System”, IADB, May-August 2006:

³² Asian Bond Market Initiative and Roadmap by the ASEAN+3; Asian Bond Fund 1 and 2; Bond Market Forum by ASEAN+3; Credit Guarantee and Investment Facility by the Asian Development Bank; and work towards creating the ASEAN Economic Community; Paul Mizen and Serafeim Tsoukas, “What promotes greater use of the corporate bond market? A study of the issuance behavior of firms in Asia”, *Oxford Economic Papers*, December 2013

³³ Deutsche Bank, “What’s behind recent trends in Asian corporate bond markets”, *Current Issues*, January 31 2014

³⁴ Deutsche Bank, “What’s behind recent trends in Asian corporate bond markets”, *Current Issues*, January 31 2014

³⁵ Serge Jeanneau and Camilo E Tovar, “Latin America’s Local Currency Bond Markets, An Overview” BIS Papers No. 36, 2008

³⁶ “Bond Markets: A Spare Tire for the Domestic Financial System”, IADB, May-August 2006

³⁷ *ibid*

exacerbated the financial stress of the time.³⁸ On the heels of these crises, Latin American EMEs have put in place a number of initiatives aimed at boosting local financial market development and the resilience of the financial system.

These include: the introduction and then privatization of pension and retirement systems which created a larger pool of local institutional investors, some Latin American EMEs have relaxed constraints on borrowing, including in foreign financial centres, privatisation of traditionally public firms and utilities has occurred and expanded the pool of potential issuers and many Latin American EMEs have put in place macro prudential measures and a corporate governance focus to improve financial stability.³⁹ These measures have supported the growth of corporate bond markets in the region, although there is as of yet no unified regional push. As a result corporate bond markets have seen growth, with the markets of Brazil, Mexico and Chile rivalling the larger Asian markets.

- *Emerging Middle-East*

Gulf Cooperation Council countries have benefited from high revenues from oil and gas production, a strong, capitalized, local banking sector (all foreign bank ownership was transferred to domestic residents in the mid-1970s), and access to international equity markets.⁴⁰ In the 1970s and 1980s, governments invested in building financial infrastructure to support deepening of financial markets. In the early 1990s, the end of the Gulf spurred focus on strengthening of financial infrastructure and intermediation, and a closer integration with international financial markets. As a result, banks were strengthened throughout the region.⁴¹ However corporate bond markets have, until recently, remained small and underdeveloped.⁴²

Since the recent global financial crisis, oil revenues have declined as commodity prices have fallen. Furthermore, cross-border bank credit has dried up and stock markets have been unreliable. Governments have injected substantial liquidity into the banking system to sustain growth and retain financial stability.⁴³ Concurrently, the economic boom in many Gulf countries is contributing to increased demand, especially for long-term infrastructure projects.⁴⁴

In this context the development of both Sukuk⁴⁵ and conventional bond markets has provided an important funding channel to meet demand, including long-term financing needs, where cross-border and domestic bank credit falls short.⁴⁶ A concerted effort by governments in the region to nurture capital markets and deepen financial markets has been undertaken. For example, in the United Arab Emirates, rules made it cheaper for companies to issue conventional and Sukuk bonds and easier to trade e.g. new minimum size of issuance, and shortened approval of issuance procedures.⁴⁷

³⁸ Serge Jeanneau and Camilo E Tovar, "Latin America's Local Currency Bond Markets, An Overview" BIS Papers No. 36, 2008

³⁹ "Bond Markets: A Spare Tire for the Domestic Financial System", IADB, May-August 2006; Serge Jeanneau and Camilo E Tovar, "Latin America's Local Currency Bond Markets, An Overview" BIS Papers No. 36, 2008

⁴⁰ Al-Amime, Muhammad al-Bashir Muhammad 'Global Sukuk and Islamic Securitization market', Islamic Law Series, v 6, 2011; Syed Bahser, Ismail Dalla, Heiko Hesse, "Gulf cooperation Council local currency bond markets and lessons from East Asia", CEPR, May 2010

⁴¹ IMF, "Financial Systems and Labor Markets in the Gulf Cooperation Council Countries, 1997

⁴² Al-Amime, Muhammad al-Bashir Muhammad 'Global Sukuk and Islamic Securitization market', Islamic Law Series, v 6, 2011

⁴³ Syed Bahser, Ismail Dalla, Heiko Hesse, "Gulf cooperation Council local currency bond markets and lessons from East Asia", CEPR, May 2010

⁴⁴ Al-Amime, Muhammad al-Bashir Muhammad 'Global Sukuk and Islamic Securitization market', Islamic Law Series, v 6, 2011

⁴⁵ Sukuk bonds comply with Islamic law, which prohibits the charging of and/or paying interest.

⁴⁶ Al-Amime, Muhammad al-Bashir Muhammad 'Global Sukuk and Islamic Securitization market', Islamic Law Series, v 6, 2011; Syed Bahser, Ismail Dalla, Heiko Hesse, "Gulf cooperation Council local currency bond markets and lessons from East Asia", CEPR, May 2010

⁴⁷ IMF, "Financial Systems and Labor Markets in the Gulf Cooperation Council Countries, 1997

- *Emerging Africa*

In Africa, corporate bond market development and access to international financial markets is relatively limited. The banking sector, mainly made up of Central Banks, local deposit-taking banks and subsidiaries from foreign commercial banks, drive financial activity.⁴⁸ Informal lending provides further access to capital and is popular due to low transaction costs. Furthermore, the pension fund and insurance sector remains underdevelopment and state-dependent.⁴⁹ Lastly, corporate bond issuance procedures are complex and burdensome, leading to corporate issuances being usually short-term.⁵⁰ As a result, financial markets are generally small and shallow, with informal lending, aid funds and concessional loans, providing a staple channel of financing.⁵¹

Nevertheless, sub-Saharan African economies are the fastest growing in the world,⁵² spurred by abundant natural resources and hydrocarbon production and export. However, this nature also makes them vulnerable to fluctuations in demand from importers.⁵³ In order to diversify, in recent years, there has been a focus on growing non-bank institutions. As a result, the supply/demand bedrocks of corporate bond markets have started to emerge e.g. pension funds.⁵⁴ Furthermore, some countries in the region have put in place rules and guidelines around the investment practices of non-bank institutions in order to support the development of financial markets, including bond markets.⁵⁵ A report from Deutsche Bank suggests that these reforms alongside political stability, macroeconomic management, improved business environment and commodity demand have contributed to increased international investor interest and cross-border flows, including local currency bond issuances.⁵⁶ Nevertheless, with the exemption of South Africa and Nigeria, corporate bond markets remain non-existent or dominated by short-term issuances.

Initiatives in the North African region have been more focused on encouraging Foreign Direct Investment (FDI) rather than portfolio investment inflows; and the lack of convertibility of North African currencies constitutes a barrier to integrating into international financial markets.⁵⁷ While FDI has helped the North African region hold a relatively high GDP, capital markets remain underdeveloped. Most corporate bond issuances from this region appeared after the financial crisis, with the balance between sovereign and corporate bonds varying from country to country. In Egypt, the majority of bonds issued are sovereign. In Tunisia, almost all issuances are corporate bonds.⁵⁸ The perception of political risk and corruption is cited in the literature as one reason holding back both local and international investors from investing in North African capital markets.⁵⁹ Also, small government bond markets mean a lack of a yield curve for pricing corporate bonds.⁶⁰ Another reason is that the banking sector, unlike in other emerging markets, is underdeveloped as is the

⁴⁸ Yibin Mu, Peter Phelps, Janet G. Stotsky, "Bond Markets in Africa", IMF Working Paper, 2013

⁴⁹ AfDB, "Capital Market Development in North Africa", Economic Brief, 2012; Franklin Allen, Isaac Otchere, Lemma W. Senbet, "African financial systems: A review", Review of Development Finance, 2011

⁵⁰ Franklin Allen, Isaac Otchere, Lemma W. Senbet, "African financial systems: A review", Review of Development Finance, 2011; World Bank, "Financial Sector in MENA", Sector Brief, 2008

⁵¹ Franklin Allen, Isaac Otchere, Lemma W. Senbet, "African financial systems: A review", Review of Development Finance, 2011

⁵² IIF, "Sub-Saharan Africa: Hitting Pockets of Turbulence", November, 2014

⁵³ IIF, "Sub-Saharan Africa: Reforms Needed for Higher Growth", November, 2013

⁵⁴ O Janet Adelegan and Bozena Radzewicz-Bak, "What Determines Bond Market Development in sub-Saharan Africa?", IMF Staff Working Papers, September 2009

⁵⁵ O Janet Adelegan and Bozena Radzewicz-Bak, "What Determines Bond Market Development in sub-Saharan Africa?", IMF Staff Working Papers, September 2009

⁵⁶ Deutsche Bank, "Capital Markets in Sub-Saharan Africa", Research Briefing, October 7, 2013

⁵⁷ AfDB, "Capital Market Development in North Africa", Economic Brief, 2012

⁵⁸ *ibid*

⁵⁹ *ibid*

⁶⁰ David A. Robalino, Edward Whitehouse, Anca Mataoanu, Alberto Musalem, Elisabeth Sherwood, Oleksiy Sluchynsky, Pensions in the Middle East and North Africa: Time for Change, Orientations in Development series, The World Bank, 2005

pension and insurance sector.⁶¹ As a result, underwriting and similar services are absent and a solid domestic investor base is lacking. Furthermore, without even bank lending, SMEs face additional hurdles in accessing financing, making it difficult for them to grow into the larger firms needed to be eventually corporate bond issuers.

- *Emerging Europe*

In Emerging Europe, countries have utilized domestic and foreign bank lending to meet their financing needs. This is in part due to the early entrance of foreign banks in the region.⁶² This funding mix mirrors the rest of Europe, where bank lending has traditionally dominated.⁶³ In general, banks have been highly liquid, and the relative costs of borrowing are low (compared to bond and equity markets). Concurrently, there has been limited domestic savings, lack of market infrastructure, legal uncertainties and currency restrictions across the region, which have hampered financial market development. Issuance costs have also been relatively high (including cost of compliance with regulation).⁶⁴

In the 1990s, emerging European countries underwent a transition period, with strong growth experienced in these countries⁶⁵ and political and economic stability improved. Governments committed to sustaining macroeconomic stability and securities regulation was put in place, providing a basis for financial market development.⁶⁶ A group of emerging European countries ascended to the EU in 2004, with the prospect held open for others. In adopting EU directives concerning finance, market conditions continued to improve. Privatization of SMEs and large firms created potential issuers. Pension funds, insurance funds and mutual funds emerged,⁶⁷ although they are often restricted from investing in unrated securities.

In 2007/8, the financial crisis and proceeding regulation in AEs saw AE banks shrink their balance sheets and trim back their foreign lending, leading to a potential capital squeeze for emerging Europe corporates which rely on foreign bank lending. As a result there has been concerted focus on developing local capital markets⁶⁸ and foreign investor interest has grown - leading to the emergence of nascent corporate bond markets.⁶⁹ For example, in 2009 the European Bank for Reconstruction and Development launched the Vienna initiative.⁷⁰

Nevertheless, corporate bond markets in some Emerging Europe EMEs often use private placement, with banks playing a leading role as both issuer and investor.⁷¹ Issuances are generally short-term, and sporadic. Foreign investor interest is increasing, although potential is limited due to emerging European markets making-up only a small proportion of major international benchmark indices.⁷² Some commenters suggest that corporate bond markets also face crowding out due to highly developed government bond markets and increasing government need for financing in the region.⁷³ Lastly, while accession to the EU has provided a basis for the structural change underpinning

⁶¹ AfDB, "Capital Market Development in North Africa", Economic Brief, 2012; David A. Robalino, Edward Whitehouse, Anca Mataoanu, Alberto Musalem, Elisabeth Sherwood, Oleksiy Sluchynsky, [Pensions in the Middle East and North Africa: Time for Change](#), Orientations in Development series, The World Bank, 2005

⁶² Li L Ong, Silvia Iorgova, "The Capital Markets of Emerging Europe: Institutions, Instruments and Investors, IMF Staff Working Paper, 2008

⁶³ Ibid

⁶⁴ Ibid

⁶⁵ Micael Schroder (ed), "The New Capital Markets in Central and Eastern Europe", 2001

⁶⁶ Li L Ong, Silvia Iorgova, "The Capital Markets of Emerging Europe: Institutions, Instruments and Investors, IMF Staff Working Paper, 2008

⁶⁷ Ibid

⁶⁸ Ibid

⁶⁹ Peter Haiss, Stefan Marin, "Corporate Bonds as Financing Vehicle in Central and Eastern Europe", 11th Annual Conference on Business and Marketing Strategies for Central & Eastern Europe, December, 2003

⁷⁰ A framework for safeguarding the financial stability of emerging Europe. See <http://vienna-initiative.com/> for more information.

⁷¹ Li L Ong, Silvia Iorgova, "The Capital Markets of Emerging Europe: Institutions, Instruments and Investors, IMF Staff Working Paper, 2008

⁷² Ibid

⁷³ Daniel Sachs, "The Impact of an Emerging European Corporate Bond Market on Corporate Governance", in OECD, *Corporate Governance, Value Creation and Growth: The Bridge between Finance and Enterprise*, OECD publishing

development of financial markets, the prospect also raises questions about the necessity of a local corporate bond market – where a European corporate bond market already exists.

3.3 A closer look at size, depth and growth of EME corporate bond markets

✧ *Three indicators of corporate bond market development in EMEs are corporate bond market size, corporate bond market depth and corporate bond market growth. All three indicators highlight a different dimension for consideration when it comes to comparing development across EMEs. For example, size (amount outstanding) provides information on which EMEs have the largest corporate bond markets (in absolute dollar terms) and which have the smallest.*

Corporate bond market depth (outstanding as a percentage of GDP) weights the size indicator by the size of the overall economy. It can provide information on which economies have large corporate bond markets relative to the size of their economy, and thus deep, and which have corporate bond markets that are small relative to the size of their economy, and thus shallow. This indicator can also be interpreted as a proxy for the importance of corporate bond markets in an economy. In some cases countries may have small corporate bond markets in absolute terms, but deep/important corporate bond markets when taking into account the size of their GDP.⁷⁴

Lastly, growth in the size of corporate bond markets (measured here as the compound annual growth rate or year on year growth) helps in differentiating EMEs with faster and slower growing corporate bond markets, as well as those EMEs where corporate bond market growth has stalled. It also helps in identifying those EMEs which may have small and/or shallow corporate bond markets now, but which show fast development.

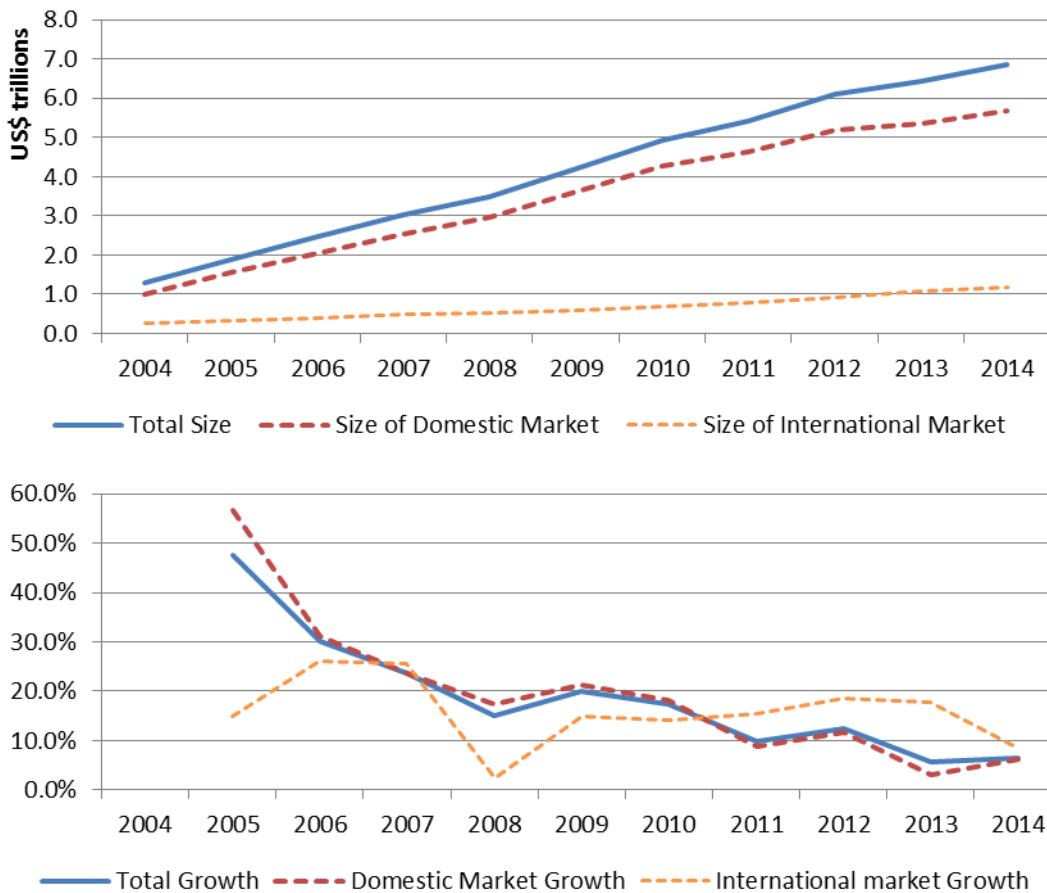
EME corporate bond markets have more than tripled in size over the last 10 years, reaching \$6.9 trillion in 2014 (compared to \$1.9 trillion in 2005) (see Figure 3). Markets in China, South Korea and Brazil make up the majority of this size, with total corporate bond market sizes of \$2.7 trillion, \$1.1 trillion and \$0.9 trillion respectively. Splitting total corporate bond market size into domestic and international markets⁷⁵ also provides further insight. For example, the split shows that the large size of corporate bond markets is supported mainly by domestic corporate bond markets, which reached \$5.7 trillion in 2014. International bond markets, in comparison, reached just \$1.2 trillion in size in 2014.

In terms of growth, Year-on-Year growth for EME domestic corporate bond markets has been declining (6% in 2013-2014 compared to 57% in 2004-2005), although less for international corporate bond markets (8% in 2013-2014 compared to 15% in 2004-2005). In terms of the compound annual growth rate (2004-2014), both domestic and international corporate bond markets registered around 14%.

⁷⁴ However there are caveats to using this indicator as a proxy for corporate bond market size, depth or importance. If a country has a small GDP and a firm puts out a single issuance, close to or equivalent to the size of the GDP, this would not necessarily indicate a large, deep, liquid or important corporate bond market.

⁷⁵ Domestic corporate bond markets are defined as consisting of corporate bond issues that are in local currency, are issued by a local issuer and are intended for domestic investment. International corporate bond markets are made up of all other issues.

Figure 3: Size (amount outstanding) and YoY growth of corporate bond markets



Source: IOSCO research department calculations based on data from BIS, ABO, ECB, Dealogic, IOSCO internal data gathering exercises and local authorities
 Note: Total growth is the YoY growth rate

More than two thirds of the aggregate EME domestic corporate bond market size is accounted for by China, South Korea and Brazil. A country level perspective reveals the epicentres of the significant size and growth of EME corporate bond markets in recent years (see Figure 4 and Figure 5). The EME jurisdictions with the largest domestic corporate bond markets are China, South Korea and Brazil. The size of their domestic corporate bond markets alone made up around 70% of the total size of domestic corporate bond markets in Emerging Markets.

Turkey, Saudi Arabia, Kazakhstan, India, Russia and Nigeria have the fastest growing domestic corporate bond markets. In terms of growth of domestic corporate bond markets, Turkey, Saudi Arabia, Kazakhstan, India, Russia and Nigeria have all experienced a compounded annual growth rate (CAGR) of over 20% over the last 10 years. More than a third of the countries in the dataset have experienced a CAGR greater than 10% over the last decade. However for almost one half of EMEs in the dataset, growth has been non-existent or negligible, if domestic local currency corporate bond markets exist at all.

South Korea, Malaysia and China have the deepest domestic corporate bond markets. South Korea’s markets are equivalent to almost 90% of GDP, Malaysia’s markets 56% of GDP and China’s around 46% of GDP. In comparison, almost 40% of emerging markets have corporate bond markets with a depth less than 1% of their GDP.

The EMEs with the largest international corporate bond markets are South Korea, Mexico and Brazil. These three markets have international corporate bond markets with outstanding of \$169 billion, \$136 billion and \$105 billion respectively. Other markets such as Bermuda, Russia and United Arab Emirates also boast large international corporate bond markets (> \$70 billion).

Many EMEs have seen fast growth of their international corporate bond markets over the last decade or so. In terms of growth, a number of EMEs boast CAGR's greater than 20% - though many of these EMEs have started from a low base. Turkey and Peru have experienced growth (CAGR) greater than 50%.

Depth/importance relative to real economy of EME international corporate bond markets is generally low, with some exceptions. Bermuda and the Bahamas have international corporate bond markets bigger than the size of their GDP. Barbados, Panama, the United Arab Emirates, Cyprus and Chile all have international corporate bond markets greater than 20% of their GDP. However, more than half of the EMEs with some international corporate bond market activity, have a market depth less than 5% of GDP. South Korea, Mexico and Brail all have depth less than 20% of GDP, despite being the EMEs with the largest international corporate bond markets.

Figure 4: Size, Growth and Depth Rankings – EMEs Domestic Corporate Bond Markets (2014)

Emerging Market (rank)	Size (US\$ billions)	Emerging Market (rank)	Growth (CAGR 2005-2014)	Emerging Market (rank)	Depth (% of GDP)
China	2702.50	Turkey	91.13%	South Korea	87.72%
South Korea	890.31	Saudi Arabia	60.22%	Malaysia	56.08%
Brazil	839.11	Kazakhstan	27.32%	China	45.57%
Mexico	190.72	India	26.18%	Brazil	39.16%
Russia	164.59	Russia	25.68%	Thailand	38.04%
India	156.39	Nigeria	23.18%	Israel	33.99%
Malaysia	138.82	Brazil	19.13%	Chinese Taipei	24.05%
Thailand	121.32	Vietnam	18.61%	Cyprus	21.30%
Chinese Taipei	103.00	China	16.97%	Malta	20.91%
Israel	78.74	Chile	16.80%	Mexico	18.15%
South Africa	62.11	Slovakia	16.76%	South Africa	17.01%
United Arab Emirates	43.56	Thailand	16.06%	United Arab Emirates	15.16%
Poland	29.23	Cyprus	15.62%	Czech Republic	12.41%
Czech Republic	24.63	Morocco	15.11%	Russia	10.79%
Chile	21.23	Czech Republic	14.48%	Chile	9.77%
Saudi Arabia	20.81	Israel	14.04%	India	9.15%
Indonesia	20.08	Colombia	13.72%	Slovakia	7.70%
Argentina	14.65	Philippines	12.74%	Poland	6.22%
Kazakhstan	8.42	Egypt	12.25%	Kazakhstan	5.69%
Slovakia	6.73	Croatia	11.43%	Argentina	3.99%
Turkey	6.51	Poland	10.68%	Saudi Arabia	3.95%
Peru	5.70	Latvia	10.24%	Peru	3.71%
Cyprus	4.92	Indonesia	10.22%	Indonesia	2.83%
Philippines	3.00	Malta	10.01%	Bulgaria	2.33%
Colombia	2.41	Malaysia	8.80%	Latvia	1.65%
Malta	1.79	Bulgaria	8.51%	Philippines	1.50%
Bulgaria	1.11	South Africa	8.07%	Croatia	0.92%
Egypt	1.02	South Korea	7.62%	Turkey	0.89%
Vietnam	0.72	Pakistan	5.99%	Colombia	0.84%
Nigeria	0.70	Romania	5.75%	Vietnam	0.64%
Croatia	0.54	Chinese Taipei	5.37%	Slovenia	0.57%
Morocco	0.42	Argentina	5.34%	Egypt	0.47%
Latvia	0.40	Mexico	2.84%	Morocco	0.46%
Romania	0.35			Nigeria	0.30%
Pakistan	0.27			Romania	0.21%
Slovenia	0.27			Lithuania	0.19%
Lithuania	0.07			Pakistan	0.15%
Ukraine	0.07			Tunisia	0.08%
Tunisia	0.04			Dominican Republic	0.07%
Dominican Republic	0.04			Ukraine	0.05%

Source: IOSCO research department calculations based on data from BIS, ABO, ECB, Dealogic, IOSCO internal data gathering exercises and local authority sources

Note: EMEs not included in tables have nil or zero values

Figure 5: Size, Growth and Depth Rankings – EMEs International Corporate Bond Markets

Emerging Market (rank)	Size (US\$ billions)	Emerging Market (rank)	Growth (CAGR 2005-2014)	Emerging Market (rank)	Depth (% of GDP)
South Korea	168.95	Turkey	64.98%	Bermuda	1681.86%
Mexico	136.30	Peru	50.56%	Bahamas	136.78%
Brazil	104.78	Azerbaijan	47.24%	Barbados	54.36%
Bermuda	92.06	Slovenia	44.03%	United Arab Emirates	26.12%
Russia	80.32	Costa Rica	39.09%	Panama	25.38%
United Arab Emirates	75.08	Nigeria	37.08%	Cyprus	23.29%
Chile	45.21	Guatemala	34.13%	Chile	20.80%
Turkey	44.83	Colombia	33.55%	Bahrain	19.42%
China	42.84	Rwanda	30.20%	Jamaica	18.87%
Malaysia	32.01	Sri Lanka	30.00%	South Korea	16.65%
India	28.75	Venezuela	27.78%	Peru	14.39%
Philippines	24.46	Barbados	27.41%	Mexico	12.97%
Venezuela	22.68	Paraguay	27.10%	Malaysia	12.93%
Indonesia	22.46	Czech Republic	25.68%	Kazakhstan	12.85%
Peru	22.14	Indonesia	23.71%	Philippines	12.25%
Colombia	20.03	Panama	22.68%	Qatar	11.95%
Kazakhstan	19.02	Kazakhstan	22.50%	Liberia	11.63%
Czech Republic	18.56	United Arab Emirates	22.38%	Trinidad & Tobago	10.20%
South Africa	17.84	Dominican Republic	22.05%	Czech Republic	9.35%
Qatar	14.96	Mexico	20.92%	Mauritius	8.60%
Israel	14.47	Saudi Arabia	20.77%	Hungary	8.26%
Bahamas	10.79	Russia	20.65%	Costa Rica	7.85%
Hungary	10.53	Morocco	19.95%	Slovenia	7.70%
Thailand	10.22	Oman	19.23%	Venezuela	7.67%
Saudi Arabia	9.81	Vietnam	18.08%	Colombia	6.98%
Chinese Taipei	9.44	South Africa	18.04%	Estonia	6.83%
Argentina	8.22	Brazil	17.73%	Lebanon	6.61%
Panama	6.87	Jamaica	17.42%	Malta	6.60%
Poland	5.66	Poland	16.97%	Tunisia	6.55%
Cyprus	5.38	China	16.70%	Israel	6.25%
Bahrain	4.99	Slovakia	16.47%	Turkey	6.13%
Ukraine	4.70	Bulgaria	16.24%	Croatia	5.69%
Nigeria	4.10	Philippines	15.23%	Paraguay	5.32%
Slovenia	3.63	Chile	14.71%	Russia	5.27%
Slovakia	3.61	Latvia	13.75%	Brazil	4.89%
Croatia	3.35	Israel	13.44%	South Africa	4.88%
Tunisia	2.91	Bahrain	12.81%	Sri Lanka	4.59%
Costa Rica	2.85	Qatar	12.79%	Guatemala	4.56%
Lebanon	2.51	El Salvador	12.73%	Azerbaijan	4.49%
Jamaica	2.49	India	12.28%	Slovakia	4.13%
Barbados	2.41	Bermuda	11.63%	Ukraine	3.45%
Azerbaijan	2.38	South Korea	9.59%	Thailand	3.20%
Sri Lanka	2.28	Hungary	9.01%	Indonesia	3.17%
Trinidad & Tobago	2.10	Ukraine	8.31%	Bulgaria	2.78%
Guatemala	1.89	Croatia	8.20%	Oman	2.47%
Morocco	1.85	Cyprus	7.14%	Latvia	2.40%
Kuwait	1.53	Bahamas	6.69%	Dominican Republic	2.27%
Oman	1.45	Malta	5.90%	Argentina	2.24%
Bulgaria	1.33	Malaysia	4.72%	Chinese Taipei	2.20%
Estonia	1.30	Trinidad & Tobago	4.38%	El Salvador	2.17%
Dominican Republic	1.17	Thailand	3.89%	Morocco	2.04%
Paraguay	1.10	Argentina	0.49%	Saudi Arabia	1.86%
Vietnam	0.98			Nigeria	1.77%
Mauritius	0.83			India	1.68%
Latvia	0.58			Kuwait	1.28%
Malta	0.56			Poland	1.20%
El Salvador	0.46			Vietnam	0.87%
Romania	0.27			China	0.72%
Liberia	0.15			Rwanda	0.28%
Rwanda	0.02			Romania	0.16%

Source: IOSCO research department calculations based on data from BIS, ABO, ECB, Dealogic, IOSCO internal data gathering exercises and local authority sources

Note: EMEs not included in tables have nil or zero values

3.4 Underlining the heterogeneity of EME corporate bond market development

✧ *Corporate bond market development in EMEs varies considerably. Even within regions, this heterogeneity persists. This section groups the EMEs under analysis into different categories, based on the size of their domestic corporate bond markets as of end-2014. Alongside this categorization, information is presented on market growth, depth and international bond market vs domestic bond market size. The presentation of the data in this way provides an avenue for further investigation of similarities and differences in bond market development indicators across EMEs. Given data gaps, these groupings should not be considered absolute but rather as merely a method for discerning broad trends from a large dataset and from a global perspective.*

The categories for EME domestic corporate bond markets can be delineated as having ‘an absent market (less than \$0.02 billion), a ‘micro market’ (less than \$1 billion), ‘a small market’ (between \$1 and \$10 billion), ‘a developing market’ (between \$10 and \$30 billion), ‘a medium-sized market’ (between \$30 and \$100 billion) and an ‘established market’ (greater than \$100 billion). The threshold for each categorization is applied based on natural groupings within the data. Specifically, the threshold of \$100 billion for established markets is based on the ‘critical size’ considered necessary for sustainable market functioning (\$100-\$200 billion).⁷⁶

- Established Corporate Bond Markets

EMEs with established domestic corporate bond markets tend to have relatively smaller international corporate bond markets. Figure 6 lists the EMEs in the dataset with established domestic corporate bond markets. For all these EMEs, the size of the domestic corporate bond market dwarfs the respective international corporate bond markets.

While all these EMEs have relatively large domestic corporate bond markets, growth trends differ. Russia and India boast fast growth over the last decade; China, Brazil and Thailand show medium growth and South Korea, Mexico, Malaysia and Chinese Taipei slower growth.

The rate of growth of the domestic corporate bond markets in these EMEs may relate to the depth. The two EMEs with the fastest growing corporate bond markets in this group, Russia and India, still have relatively shallow corporate bond markets. While two of the EMEs with the slowest growing corporate bond markets, South Korea and Malaysia have relatively deep markets. China, Brazil and Thailand have both medium growth and moderate depth. The two exceptions are Mexico, which has seen both slow growth and shallow depth; and Chinese Taipei which has seen slow growth and moderate depth.

⁷⁶ See McCauley, R and E Remolona, “Size and liquidity of government bond markets”, BIS Quarterly Review, November. 2000

Figure 6: EME established domestic corporate bond markets (greater than \$100 billion)

Established Markets	Growth	Depth	Percentage Domestic	Percentage International
China	Medium	Moderate	98%	2%
South Korea	Slow	Deep	84%	16%
Brazil	Medium	Moderate	89%	11%
Mexico	Slow	Shallow	58%	42%
Russia	Fast	Shallow	67%	33%
India	Fast	Shallow	84%	16%
Malaysia	Slow	Deep	81%	19%
Thailand	Medium	Moderate	92%	8%
Chinese Taipei	Slow	Moderate	92%	8%

Source: IOSCO research department calculations based on data from BIS, ABO, ECB, Dealogic, IOSCO internal data gathering exercises and local authorities

Note: Growth delineated as follows: Equal to or greater than 20% CAGR (Fast); Between 10-19% CAGR (Medium); Between 1-9% CAGR (Slow); Less than 1% CAGR (Stalled/Negative growth). Depth is delineated as follows: Equal to or greater than 100% of GDP (Very Deep); Between 50% and 99% of GDP (Deep); Between 20% and 49% of GDP (Moderate); Between 5% and 19% (Shallow); Less than 5% (Very Shallow. Percentage of domestic corporate bond market size vs international corporate bond market size is based on 2014 amount outstanding.

- Medium-Sized Corporate Bond Markets

Most of the EMEs with medium sized domestic corporate bond markets, have relatively smaller international corporate bond markets. Only four EMEs in the dataset are categorized as having medium-sized domestic corporate bond markets (see Figure 7). With the exception of the United Arab Emirates, EMEs in this category all have sizeable domestic corporate bond markets compared to their respective international corporate bond markets.

EMEs in this category tend to have shallow domestic corporate bond markets. Only one EME in this category, Israel, boasts corporate bond markets with moderate depth, while the rest have shallower market depth.

Growth trends vary across the EMEs in this category. The one EME in this category showing stalled/negative growth in their domestic corporate bond markets, the UAE, also has a larger international corporate bond market. South Africa despite having a medium-sized domestic corporate bond market, shows slow growth and shallow depth. Both Israel and Poland have displayed medium growth in their domestic corporate bond markets over the last decade, although only Poland's domestic corporate bond market is still relatively shallow.

Figure 7: EME Medium-sized domestic corporate bond markets (between \$30 and \$100 billion)

Medium-sized Markets	Growth	Depth	Percentage Domestic	Percentage International
Israel	Medium	Moderate	84%	16%
South Africa	Slow	Shallow	78%	22%
United Arab Emirates	Stalled/Negative	Shallow	37%	63%
Poland	Medium	Shallow	84%	16%

Source: IOSCO research department calculations based on data from BIS, ABO, ECB, Dealogic, IOSCO internal data gathering exercises and local authorities

Note: Growth delineated as follows: Equal to or greater than 20% CAGR (Fast); Between 10-19% CAGR (Medium); Between 1-9% CAGR (Slow); Less than 1% CAGR (Stalled/Negative growth). Depth is delineated as follows: Equal to or greater than 100% of GDP (Very Deep); Between 50% and 99% of GDP (Deep); Between 20% and 49% of GDP (Moderate); Between 5% and 19% (Shallow); Less than 5% (Very Shallow. Percentage of domestic corporate bond market size vs international corporate bond market size is based on 2014 amount outstanding.

- Developing Corporate Bond Markets

Some EMEs with developing domestic corporate bond markets have larger international corporate bond markets, others do not. While the Czech Republic, Saudi Arabia and Argentina have larger domestic corporate bond markets, Chile and Indonesia have larger international corporate bond markets. Nevertheless, Figure 8 shows that in general, the split is much closer to even than for the EMEs in the preceding categories.

While domestic corporate bond markets for this category all have shallow depth, growth characteristics differ. In terms of growth, only Saudi Arabia has shown fast growth over the last decade. The Czech Republic, Chile and Indonesia have shown medium growth, while Argentina has shown slow growth. All EMEs in this category have either shallow or very shallow domestic corporate bond market depth.

Figure 8: EME developing domestic corporate bond markets (between \$10 and \$30 billion)

Developing Markets	Growth	Depth	Percentage Domestic	Percentage International
Czech Republic	Medium	Shallow	57%	43%
Chile	Medium	Shallow	32%	68%
Saudi Arabia	Fast	Very Shallow	68%	32%
Indonesia	Medium	Very Shallow	47%	53%
Argentina	Slow	Very Shallow	64%	36%

Source: IOSCO research department calculations based on data from BIS, ABO, ECB, Dealogic, IOSCO internal data gathering exercises and local authorities

Note: Growth delineated as follows: Equal to or greater than 20% CAGR (Fast); Between 10-19% CAGR (Medium); Between 1-9% CAGR (Slow); Less than 1% CAGR (Stalled/Negative growth). Depth is delineated as follows: Equal to or greater than 100% of GDP (Very Deep); Between 50% and 99% of GDP (Deep); Between 20% and 49% of GDP (Moderate); Between 5% and 19% (Shallow); Less than 5% (Very Shallow). Percentage of domestic corporate bond market size vs international corporate bond market size is based on 2014 amount outstanding.

- Small Corporate Bond Markets

The split between domestic and international corporate bond market size differs substantially across EMEs in this category. Figure 9 shows that while Kazakhstan, Turkey, Peru, Philippines, Columbia and Bulgaria have larger international corporate bond markets; Slovakia, Malta and Egypt have larger domestic corporate bond markets (in fact Egypt does not have an international corporate bond market). Furthermore, the size of Cyprus' domestic and international corporate bond markets are almost equivalent.

In general, growth over the last decade for these EMEs has been medium, with some exceptions. For Kazakhstan and Turkey, growth has been relatively fast and for Peru and Bulgaria, growth is negative and slow respectively.

While these EMEs have relatively small domestic corporate bond markets, not all of these markets can be considered shallow. Market depth is moderate in Kazakhstan, Slovakia, Cyprus, and Malta and shallow for the rest.

Figure 9: EME small domestic corporate bond markets (between \$1 and \$10 billion)

Small Markets	Growth	Depth	Percentage Domestic	Percentage International
Kazakhstan	Fast	Moderate	31%	69%
Slovakia	Medium	Moderate	65%	35%
Turkey	Fast	Shallow	13%	87%
Peru	Stalled/Negative	Shallow	20%	80%
Cyprus	Medium	Moderate	48%	52%
Philippines	Medium	Shallow	11%	89%
Colombia	Medium	Shallow	11%	89%
Malta	Medium	Moderate	76%	24%
Bulgaria	Slow	Shallow	46%	54%
Egypt	Medium	Shallow	100%	0%

Source: IOSCO research department calculations based on data from BIS, ABO, ECB, Dealogic, IOSCO internal data gathering exercises and local authorities

Note: Growth delineated as follows: Equal to or greater than 20% CAGR (Fast); Between 10-19% CAGR (Medium); Between 1-9% CAGR (Slow); Less than 1% CAGR (Stalled/Negative growth). Depth is delineated as follows: Equal to or greater than 100% of GDP (Very Deep); Between 50% and 99% of GDP (Deep); Between 20% and 49% of GDP (Moderate); Between 5% and 19% (Shallow); Less than 5% (Very Shallow). Percentage of domestic corporate bond market size vs international corporate bond market size is based on 2014 amount outstanding.

- Micro Corporate Bond Markets

Again, the split between domestic and international corporate bond market size differs across EMEs in this category. EMEs with micro domestic corporate bond markets (Figure 10), with the exception of Romania, Pakistan and Lithuania, all have larger international corporate bond markets. Both Pakistan and Lithuania do not have an international corporate bond market.

In terms of growth, only Nigeria's domestic corporate bond markets have shown fast growth over the last decade. Vietnam, Croatia, Morocco and Latvia have shown medium growth, while the rest have shown slow, nil or negative growth.

Domestic corporate bond market depth is generally shallow. Across all of the EMEs in this category domestic corporate bond market depth is shallow.

Figure 10: EME Micro domestic corporate bond markets (between \$0.01 and \$2 billion)

Micro Markets	Growth	Depth	Percentage Domestic	Percentage International
Vietnam	Medium	Shallow	42%	58%
Nigeria	Fast	Shallow	15%	85%
Croatia	Medium	Shallow	14%	86%
Morocco	Medium	Shallow	19%	81%
Latvia	Medium	Shallow	41%	59%
Romania	Slow	Shallow	57%	43%
Pakistan	Slow	Shallow	100%	0%
Slovenia	Stalled/Negative	Shallow	7%	93%
Lithuania	Stalled/Negative	Shallow	100%	0%
Ukraine	Stalled/Negative	Shallow	1%	99%
Tunisia	Stalled/Negative	Shallow	1%	99%
Dominican Republic	Stalled/Negative	Shallow	3%	97%

Source: IOSCO research department calculations based on data from BIS, ABO, ECB, Dealogic, IOSCO internal data gathering exercises and local authorities

Note: Growth delineated as follows: Equal to or greater than 20% CAGR (Fast); Between 10-19% CAGR (Medium); Between 1-9% CAGR (Slow); Less than 1% CAGR (Stalled/Negative growth). Depth is delineated as follows: Equal to or greater than 100% of GDP (Very Deep); Between 50% and 99% of GDP (Deep); Between 20% and 49% of GDP (Moderate); Between 5% and 19% (Shallow); Less than 5% (Very Shallow). Percentage of domestic corporate bond market size vs international corporate bond market size is based on 2014 amount outstanding.

- Absent Corporate Bond Markets

While the EMEs in this category do not appear to have domestic corporate bond markets, based on available data, all except for five have international corporate bond markets. Figure 11 shows that only Cuba, Ecuador, Ghana, Iran and Serbia and Montenegro appear to have no operational corporate bond market (or data available on these markets).⁷⁷ Bermuda's international corporate bond market reached \$92 billion in size in 2014. Venezuela, Hungary, Qatar and the Bahamas all had international corporate bond markets larger than \$10 billion. Meanwhile, Venezuela, Panama, Costa Rica, Barbados, Azerbaijan, Sri Lanka, Guatemala, Paraguay and Rwanda all had international corporate bond markets boasting a CAGR of 20% or over during the last decade.

⁷⁷ However, Ghana and Serbia appear to have corporate bond issuances not captured in the available data sets. For example, Izwe Loans Ltd. In Ghana, a lender to small businesses and individuals issued \$12 million of bonds in Q4 of 2014 according to Bloomberg (see: <http://www.bloomberg.com/news/articles/2014-11-06/izwe-loans-issues-ghana-s-first-corporate-bond-since-2007>). In Serbia, Telefonija issued a long-term corporate bond mid-2010 worth \$588,433.

Figure 11: EME Absent domestic corporate bond markets (less than \$0.02 billion)

Absent markets	Growth	Depth	Percentage Domestic	Percentage International
Bermuda	Stalled/ Negative	No Market	0%	100%
Venezuela	Stalled/Negative	No Market	0%	100%
Hungary	Stalled/Negative	No Market	0%	100%
Qatar	Stalled/Negative	No Market	0%	100%
Bahamas	Stalled/Negative	No Market	0%	100%
Panama	Stalled/Negative	No Market	0%	100%
Bahrain	Stalled/Negative	No Market	0%	100%
Costa Rica	Stalled/Negative	No Market	0%	100%
Lebanon	Stalled/Negative	No Market	0%	100%
Jamaica	Stalled/Negative	No Market	0%	100%
Barbados	Stalled/Negative	No Market	0%	100%
Azerbaijan	Stalled/Negative	No Market	0%	100%
Sri Lanka	Stalled/Negative	No Market	0%	100%
Trinidad & Tobago	Stalled/Negative	No Market	0%	100%
Guatemala	Stalled/Negative	No Market	0%	100%
Kuwait	Stalled/Negative	No Market	0%	100%
Oman	Stalled/Negative	No Market	0%	100%
Estonia	Stalled/Negative	No Market	0%	100%
Paraguay	Stalled/Negative	No Market	0%	100%
Mauritius	Stalled/Negative	No Market	0%	100%
El Salvador	Stalled/Negative	No Market	0%	100%
Liberia	Stalled/Negative	No Market	0%	100%
Rwanda	Stalled/Negative	No Market	0%	100%
Uruguay	Stalled/Negative	No Market	0%	100%
Cuba	Stalled/Negative	No Market	0%	0%
Ecuador	Stalled/Negative	No Market	0%	0%
Ghana	Stalled/Negative	No Market	0%	0%
Iran	Stalled/Negative	No Market	0%	0%
Serbia a Montenegro	Stalled/Negative	No Market	0%	0%

Source: IOSCO research department calculations based on data from BIS, ABO, ECB, Dealogic, IOSCO internal data gathering exercises and local authorities

Note: Growth delineated as follows: Equal to or greater than 20% CAGR (Fast); Between 10-19% CAGR (Medium); Between 1-9% CAGR (Slow); Less than 1% CAGR (Stalled/Negative growth). Depth is delineated as follows: Equal to or greater than 100% of GDP (Very Deep); Between 50% and 99% of GDP (Deep); Between 20% and 49% of GDP (Moderate); Between 5% and 19% (Shallow); Less than 5% (Very Shallow. Percentage of domestic corporate bond market size vs international corporate bond market size is based on 2014 amount outstanding.

3.5 Identifying determinants of corporate bond market development

✧ *Factors related to the development of corporate bond markets cover a suite of economic, financial and institutional elements. These factors differ depending on whether domestic or international corporate bond markets are in focus; and whether the dimension of corporate bond market development under investigation refers to the size, depth or activity.*

The section of the report aims to tease out the common factors underpinning those EMEs with fast growing, large and deep corporate bond markets; and identify some possible determinants of corporate bond market development across the sample of EMEs. The section is divided as follows. Firstly, a brief review of the relevant literature is presented. Next, the methodology for two studies is presented, with reference to two technical appendixes (1 and 2). Lastly the results of these two studies are discussed.

- Background and Literature

A number of studies have outlined potential barriers to the development of corporate bond markets. These barriers can include (1) weak regulatory frameworks; (2) lack of market infrastructure and presence of intermediaries; (3) a small and unsustainable investor base; (4) high costs and complexity of issuance of bonds compared to bank credit; (5) legal and investor protection issues; (6) corporate governance issues; (7) undeveloped government bond markets; (8) small number of mature firms; and (9) weak disclosure standards.⁷⁸

In general, these factors seem to be driven by economic size and level of economic development. The World Economic Forum explains in their 2012 report⁷⁹ that economic size allows for a liquid sovereign bond market, which in turn provides a price and yield benchmark for corporate bonds. Furthermore, the larger the economy, the more likely companies and their financing needs will grow. Larger financing needs lead to larger bond issuance sizes, which reduces the relative cost of bond financing due to economies of scale.

In terms of the level of economic development, this indicator affects the ability for EMEs to offer corporate bonds on a continual basis. Furthermore, the 'weak business and legal environment' of less developed EMEs can have implications for investor protection and confidence and thus the growth of corporate bond markets.⁸⁰ In addition, lesser developed economies may struggle to support sustained investor demand without institutional investors such as pension funds, mutual funds and insurance companies to provide a base.

Empirical studies on corporate bond market development are numerous, although the body of literature is much smaller compared to investigations into equity markets and the banking sector.

⁷⁸ "Development of Corporate Bond Markets in the Emerging Markets", IOSCO 2010; World Economic Forum, Boston Consulting Group, "Redefining the Emerging Market Opportunity", Chapter 4: The Opportunity in Corporate Bonds, 2012; Borensztein, Eduardo, Kevin Cowan, Barry Eichengreen and Ugo Panizza, 2008, Bond markets in Latin America: On the Verge of a Big Bang?, Cambridge, MA: The MIT Press; Inter-American Development Bank (IADB), 2007, Living with Debt: How to Limit the Risk of Sovereign Finance, Economic and Social Progress in Latin America: 2007 Report, Washington, DC; Herring, Richard J. and Nathporn Chatusripitak, 2006, The Case of the Missing Market: the Bond; Endo, T. 2008. "Broadening the Offering Choice of Corporate Bonds in Emerging Markets: Cost-Effective Access to Debt Capital." *Policy Research Working Paper* 4655. Washington DC: The World Bank Group.

Market & Why it Matters for Financial Development, in L. Klein and T. Shabbir (eds.) *Recent Financial Crises: Analysis, Challenges, and Implications*, Edward Elgar Publishing

⁷⁹ World Economic Forum, Boston Consulting Group, "Redefining the Emerging Market Opportunity", Chapter 4: The Opportunity in Corporate Bonds, 2012

⁸⁰ World Economic Forum, Boston Consulting Group, "Redefining the Emerging Market Opportunity", Chapter 4: The Opportunity in Corporate Bonds, 2012; Stijn Claessens and Burcin Yurtoglu, "Corporate Governance in Emerging Markets: A Survey", January 2012

Interesting insights can be gleaned from the studies conducted already. The majority of existing studies either use a sample of developing and emerging economies or focus on a regional micro-panel. At the regional level, a study by Paul Mizen and Serafeim Tsoukas focuses on bond markets in Asia over the period 1995 and 2007, incorporating micro-level panel data for nine Asian countries, corporate bond issuance activity and firm level characteristics. This study focuses on corporate bond market issuance and identifies having regional initiatives focused on bond market development as an important prerequisite in increased issuance.⁸¹

A study by Biswa Nath Bhattacharyay⁸² on corporate bond financing in 10 East Asian economies pinpoints economic size, level of development, economic openness, exchange rate variability, size of the banking system and interest rate variability as important determinants of corporate bond market development in Asia. A study by Yibin Mu et al suggest that corporate bond market development in Africa is positively related to economic size, level of development, quality of institutions, interest rate volatility and negatively related to higher interest rate spreads and current account openness.⁸³ Finally, a study performed by Eichengreen, Panizza, and Borensztein looks at government and corporate (split in terms of financial and non-financial) bond markets in Latin America. Again, similar indicators are highlighted such as economic size, GDP per capita, trade openness, interest rate volatility, size of banking sector and interest rate spread.⁸⁴

At the global level, fewer studies exist. One study by Matias Bruan and Ignacio Briones compares bond market development across 46 countries, both emerging and developed, for the period 1995 to 2004, using correlation analysis. The study reveals that the level of economic development, banking sector development and importance of institutional investors is positively correlated with certain aspects of bond market development.⁸⁵ A study by Barry Eichengreen and Pipat Luengnaruemitchai⁸⁶ uses generalized least squares panel data analysis for data between 1990 and 2001 and for 41 developing and developed countries. The study focuses on both local currency government and corporate bond markets. The results of the study suggest that economic size (GDP), exports, level of corruption, distance from the equator, accounting standards, size of banking sector, bureaucracy quality, being in Asia and exports are positive and significant, while English legal origin, interest rate spreads and exchange rate volatility are negative and significant. Lastly, a paper by Kee-Hong Bae⁸⁷ looks specifically at local currency bond markets around the world, for 43 countries between 1990 and 2009, and suggests that GDP per capita is important for financial corporate bond markets. For non-financial corporate bond markets, exchange rate volatility and lending rates are negatively related to corporate bond market size. A developed government bond market and banking sector is positively related. Institutional factors did not seem to have significant predictive value in the study.

⁸¹ Paul Mizen and Serafeim Tsoukas, "What promotes greater use of the corporate bond market? A study of the issuance behaviour of firms in Asia", *Oxford Economic Papers*, 2014 (latest version)

⁸² Biswa Nath Bhattacharyay, "Bond Market Development in Asia: An empirical analysis of major determinants", ADBI Working Paper no. 300, July 2011

⁸³ Yibin Mu, Peter Phelps, Janet Stotsky, "Bond Markets in Africa", IMF Working paper, 2013

⁸⁴ Eichengreen, Barry, Ugo Panizza, and Eduardo Borensztein, 2008, "Prospects for Latin American Bond Markets: A Cross-Country View," in Borensztein, Cowan, Eichengreen, and Panizza (eds.), *Bond Markets in Latin America: On the Verge of a Big Bang?* (Cambridge: MIT Press), pp. 247–290.

⁸⁵ Matias Braun, Ignacio Briones, "The Development of Bond Markets around the World", 2006

⁸⁶ Barry Eichengreen, Pipat Luengnaruemitchai, "Why doesn't Asia have bigger bond markets?", NBER Working Paper, 2004

⁸⁷ Kee-Hong Bae, "Determinants of local currency bonds and foreign holdings: Implications for bond market development in the people's Republic of China", ADB Working Paper Series on Regional Economic Integration, 2012

- Methodology

The analysis in this report builds on the existing literature to develop a further understanding of the drivers of corporate bond market development through a two-step approach. Firstly, rank correlation analysis is used to identify relationships between different aspects of domestic and international corporate bond market development and a variety of financial, economic and institutional factors. Secondly, fixed effects regression is used on a unique set of panel data⁸⁸ for 62 EMEs. Where previous analyses have sought to find and differentiate determinants of corporate vs. government bond markets; or financial and non-financial corporate bond markets, this study looks to identify broad determinants of corporate bond market development and also how these determinants may differ in relation to the development of domestic corporate bond markets vs. international corporate bond markets. Such a study has not been undertaken using this method, to the knowledge of the author.

A Kendall tau non-parametric correlation test has been conducted to investigate relationships between a number of different economic, financial, legal and institutional factors, based on those identified in previous studies, and corporate bond market development in EMEs only. This step was taken to (1) identify interesting relationships between variables; and (2) refine the variables under observation for the regression analysis. A description of the data, method and results of this correlation analysis is provided in Technical Appendix 1.

To test whether some of these variables could have predictive capabilities when it comes to determining the extent of corporate bond market development in emerging markets, a multivariate regression analysis with fixed effects was undertaken, using panel data for 62 countries in the dataset. One caveat is that complete panel data for all countries across all indicators is not available, resulting in an unbalanced panel. These countries were selected due to having at least two data points per variable under investigation. Developed countries are not included in the sample as the focus of the study is to explore those characteristics that differ between EMEs specifically. A further technical discussion of the methodology and analysis as well as the results is presented in Technical Appendix 2.

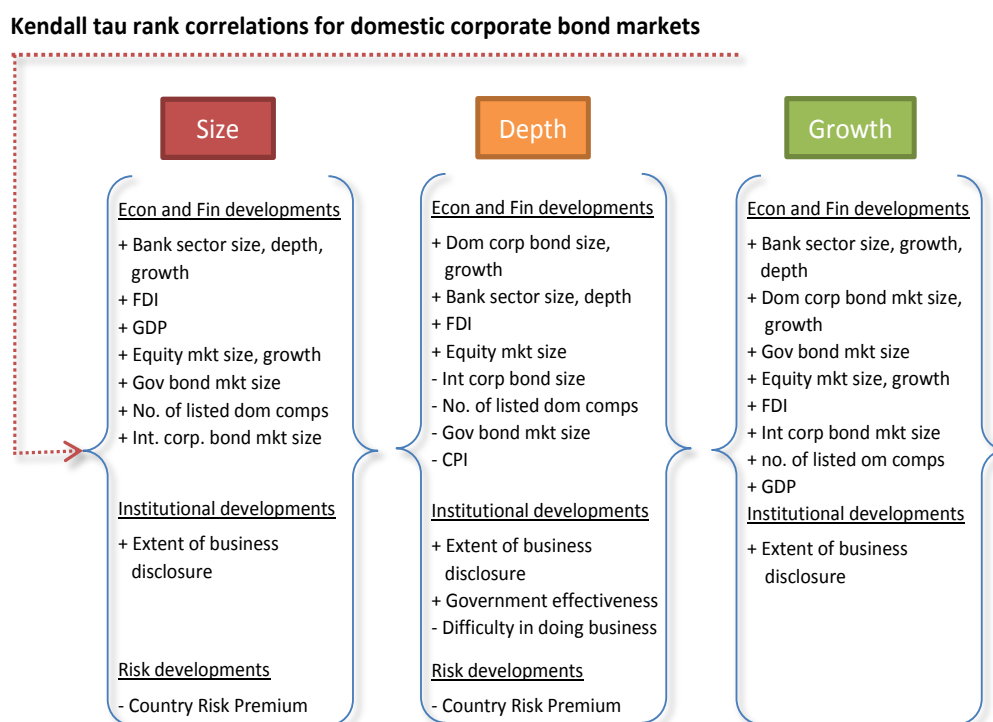
- Results and Discussion

The results of these two studies reveal interesting insights about the relationship between a range of financial, economic and institutional factors and corporate bond market development in emerging economies.

The first study, reflecting the literature, reveals a number of relationships between domestic and international corporate bond market development and economic & financial; institutional; and risk related developments. Indicators that show significant rank correlation with domestic corporate bond market development are provided in Figure 12.

⁸⁸ Fixed effects is a powerful regression tool as it can help provide an empirical basis for suggesting causal relationships. It also limits endogeneity and time-invariant omitted variable bias. See Glenn Firebaugh, Cody Warner, Michael Massoglia, "Fixed Effects, Random Effects, and Hybrid Models for Causal Analysis", *Handbook of Causal Analysis for Social Research*, March 2013.

Figure 12: Domestic corporate bond market development correlations



Source: IOSCO Research Department

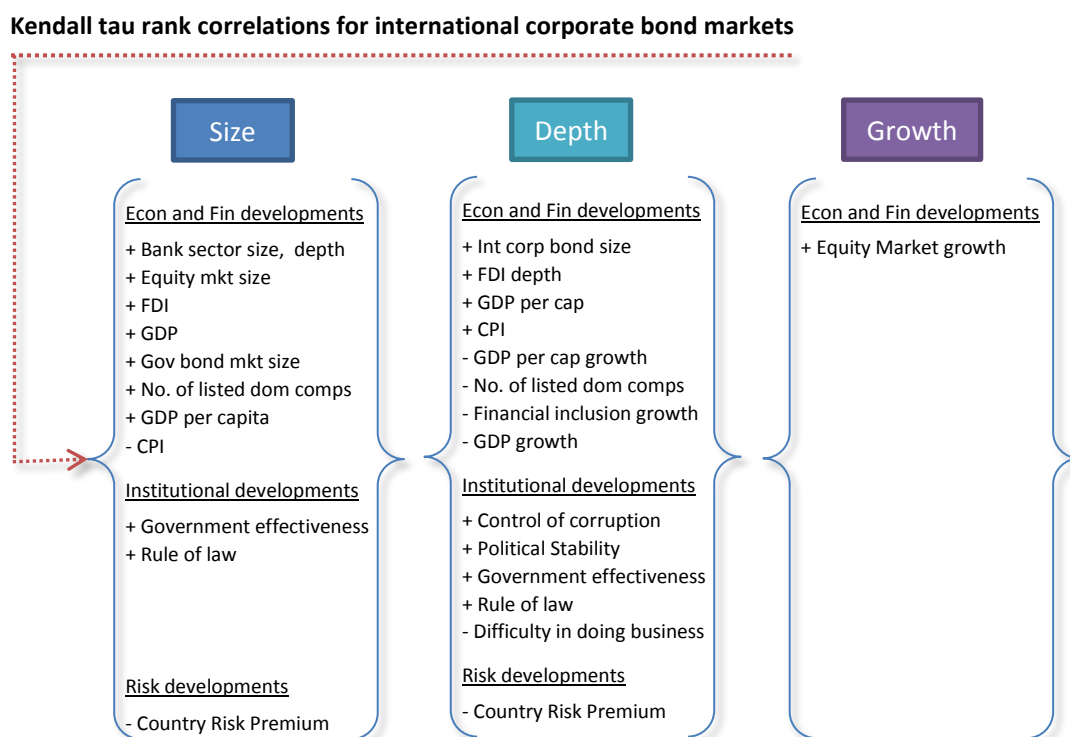
A positive and significant relationship between countries which have relatively large domestic corporate bond markets in terms of size and economic and financial factors such as the level of economic development; equity market size, government bond market size and banking sector size; and the amount of FDI. Institutional factors do not show a significant relationship with domestic corporate bond market size, with the exception of the extent of business disclosure. On the flip side, there is a weak negative albeit significant relationship between corporate bond market size and the country risk premium.

Domestic corporate bond market depth/importance was strongly related to the overall size of domestic corporate bond markets. Other significant positive relationships also appeared with economic and financial factors concerning the banking sector, equity markets, government bond markets, FDI and the size of international corporate bond markets. The extent of business disclosure, government effectiveness and level of economic development also seemed to have a positive relationship with domestic corporate bond market depth/importance. A negative correlation was observed regarding the country risk premium, difficult in doing business index and the consumer price index.

Lastly, the growth of domestic corporate bond markets seems to have a positive relationship with a number of economic and financial factors related to the banking sector, other dimensions of corporate bond market development, government bond markets, equity markets, FDI, international corporate bond market size and GDP. Also a positive relationship was observed to be significant with the extent of business disclosure.

Indicators that show significant rank correlation with international corporate bond market development are provided in Figure 13.

Figure 13: International corporate bond market development correlations



Source: IOSCO Research Department

International corporate bond market size however not only shows a positive and significant relationship between similar financial and economic factors but also institutional and demographic factors such as the rule of law and government effectiveness. GDP per capita can also be considered an institutional development as well as an economic indicator, as the variable can be interpreted as a proxy for the 'standard of living'. A significant but negative correlation was recorded between international corporate bond market size and the country risk premium and consumer price index (CPI).

International corporate bond market depth/importance again showed positive correlation with a number of economic and financial indicators such as the size of international corporate bond markets, FDI importance, GDP per cap and CPI. Institutional factors such as the control of corruption, political stability, and government effectiveness and rule of law also showed a significant positive correlation.

The depth/importance of international corporate bond markets appears to have a negative correlation with the difficulty in doing business, country risk premium, number of listed companies, growth in GDP per capita, financial inclusion growth and GDP growth. These last four relationships may seem counterintuitive but make sense when we consider that economies experiencing higher rates of growth regarding certain financial and economic indicators tend to be starting from a lower base of overall economic development.

In the case of international corporate bond markets growth, only the growth of equity markets showed a significant, positive relationship.

The second study, the multivariate regression with fixed effects, takes these broad findings one step further in order to identify potential determinants of corporate bond market development, rather than just a relationship between variables. This study also reveals a number of differences in potential determinants, depending on whether one is looking at (1) domestic or international corporate bond market development; and (2) corporate bond market development in terms of size, depth/importance and activity.

The empirical evidence suggests that there is indeed a difference in the determinants for domestic corporate bond market development and international corporate bond market development in EMEs; and that different factors are significant depending on what part of corporate bond market development is under focus – size, depth or activity. The independent variables used in the regression are: Foreign Direct Investment (as a % of GDP); Government bond market size; GDP per capita; Institutional quality; Number of listed companies; Bank spread; Percentage of non-performing loans; Financial sector depth (the sum of equity market capitalization and bank assets, over GDP); Bank assets as a percentage of GDP; and a risk indicator comprised of the country risk premium multiplied by the Consumer Product Index. The dependant variables included domestic, international and total corporate bond market size, depth and activity (issuance volume). The results of the regression are produced in [Technical Appendix 2](#). A summary of the findings are provided in Figure 14.

Figure 14: Determinants of corporate bond market development (summary of regression results)

	Dom. corp. bond mkt. size	Int. corp. bond mkt. size
Positive impact	+ Gov. bond mkt. size	+ GDP per capita
	+ No. listed dom. comp.	+ No. listed dom. comp
	+ Bank assets (% GDP)	+ Institutional Qual.
Negative impact	- Country risk prem*CPI	- bank spread
		- Financial sec. depth

	Dom. corp. bond mkt. depth	Int. corp. bond mkt. depth
Positive impact	+ GDP per capita	+ FDI (% GDP)
	+ Financial sec. depth	+ No. listed dom. comp
		+ Non performing loans (%)
Negative impact		- bank spread

	Dom. corp. bond mkt. activity	Int. corp. bond mkt. activity
Positive impact	+ Gov. bond mkt. size	+ Gov. bond mkt. size
	+ bank spread	+ GDP per capita
		+ No. listed dom. comp
Negative impact		- bank spread
		- Country risk prem*CPI

Source: IOSCO research department

The results suggest that domestic corporate bond market size is positively influenced by government bond market size, the number of listed domestic companies and bank assets as a percentage of GDP. Domestic corporate bond market size appears to be negatively impacted by external risk factors, as captured through the country risk premium x consumer price index indicator.

International corporate bond market size appears to be influenced by a wholly separate set of factors, with the exception of the number of listed domestic companies (which is positively related). Other factors that may positively impact the size of international corporate bond markets are the GDP per capita and institutional quality. Factors that may negatively influence international corporate bond markets include the bank spread and the depth of the local financial sector.

Corporate bond market depth of EMEs appears to require a different mix of factors than what seems relevant for corporate bond market size. Domestic corporate bond market depth appears positively impacted by GDP per capita and financial sector depth. International corporate bond market size show evidence of being positively related to government bond market size, GDP per capita and the number of listed domestic companies. The bank spread and risk indicator (CRP*CPI) appear to have a negative impact.

Lastly domestic corporate bond market activity, a flow indicator, also shows evidence of some relationship with our independent variables. Domestic corporate bond market activity appears to be positively impacted by government bond market size and the bank spread. While international corporate bond market activity also appears to be positively impacted by government bond market size but negatively impacted by the bank spread. Other positive relationships were observed between international corporate bond market activity and GDP per capita and the number of listed domestic companies. The risk indicator (CRP*CPI) appears to have a negative relationship.

From these results, one could infer that domestic corporate bond market development appears more related to infrastructure based improvements, with some exceptions and international corporate bond market development appears more related to institutional developments, with some exceptions. For example, domestic corporate bond market development is positively impacted by government bond market size (the existence of which can provide a benchmark yield curve and also introduce base infrastructure for fixed income); the number of listed domestic companies (which implies a potential issuer base and links to having an equity market with the associated financial infrastructure in place); bank assets (% GDP) (where a robust banking sector can provide important services such as underwriting) and financial sector depth (where deeper financial markets suggest better infrastructure in place more generally to support the provision of financial services).

International corporate bond markets appear positively impacted by GDP per capita (which provides insight on the productivity of a country and standard of living); Foreign direct investment (% GDP) (which may signal the openness of institutions to foreign investment and the transference of skills, knowledge and resources); Institutional quality (a general indicator of institutional health); and non-performing loans (%) (another indicator of the health of the banking sector). Interestingly, international corporate bond market development appears negatively related to the bank spread and the financial sector depth. This suggests that the deeper (financial sector depth) and more profitable (in the case of the bank spread) the local financial sector is (excluding the domestic corporate bond market), the less incentive there is to rely on international corporate bond markets.

3.6 Other factors to consider in the development of corporate bond markets

✧ *In addition to the factors analyzed in the previous section, the literature suggests a number of additional factors that may have bearing on the development of both domestic and international corporate bond markets. The absence of applicable data precludes investigation of these variables in the previous regression model; however this section provides some insights around how these factors may still be relevant.*

Other factors that may be relevant in understanding the development of corporate bond markets in EMEs include the existence of credit rating agencies, tax treatment, investor demand for securities (e.g. the search for yield environment, growth in funds devoted to emerging markets etc.), measures of health of the domestic economy, growth in local mutual and pension funds, international presence of the firms issuing bonds and availability of hedging used to mitigate risks. Data on these factors is scarce. Further study into this area is warranted to better understand the breadth of contributing factors.

In the case of the existence of international credit rating services, available data suggests, with some exceptions, those EMEs where credit rating services were offered a longer time ago, tend to have larger domestic and/or international corporate bond markets. Conversely, those EMEs with absent or micro markets either do not have international credit rating services available, or they became available very recently.

- *Existence of Credit Ratings Agencies*

The role that credit rating agencies (CRAs) play in nurturing a sound financial architecture has been recognized by a number of commentators,⁸⁹ as has the potential risks.⁹⁰ IOSCO recognized in its 2008 report on *The Role of Credit Rating Agencies in Structured Finance Markets*,⁹¹ that “Credit Rating Agencies play an important role in most modern capital markets.”

Generally, the role of CRAs when it comes to corporate bond markets is to provide an “independent source of information on the credit standing of corporate and other issuers of debt securities”.⁹² In doing so, credit Rating Agencies can help balance information asymmetry issues inherent in markets by providing easily digestible information on the credit worthiness of borrowers to potential investors, specifically to those investors who may not have the means to conduct such an analysis themselves.⁹³ Credit ratings are sometimes essential for debt instruments as regulations exist around what ‘grade’ debt certain institutional investors are open to invest in e.g. pension funds can only invest in investment-grade debt.

⁸⁹ See for example Boot, Milbourn and Schmeits, “Credit Ratings as Coordination Mechanisms”, *Review of Financial Studies*, 19, 2006; Christina Bannier, Marcel Tyrell, “Modelling the role of Credit Rating Agencies – Do they spark off a virtuous circle?”, Working paper series / Johann-Wolfgang-

Goethe-Universität Frankfurt am Main, Fachbereich Wirtschaftswissenschaften : Finance & Accounting, No. 160, November 2005

⁹⁰ See for example Carol Ann Frost, “Credit Rating Agencies in Capital Markets: A Review of Research Evidence on Selected Criticisms of the Agencies”, *Journal of Accounting, Auditing and Finance*, July 2007; and Amadou N.R. Sy, “The Systemic Regulation of Credit Rating Agencies and Rated Markets”, *IMF Working Paper*, June 2009.

⁹¹ IOSCO, “The Role of Credit Rating Agencies in Structured Finance Markets”, May 2008 [<http://www.iosco.org/library/pubdocs/pdf/IOSCOPD270.pdf>]

⁹² Statement of The Bond Market Association SEC Hearing on Credit Rating Agencies November 21, 2002

⁹³ See a discussion of this role, in the context of developing markets, in Marwan Elkhoury, “Credit Rating Agencies and Their Potential Impact on Developing Countries” UNCTAD, 2008

In the case of emerging markets, credit ratings serve an enhanced purpose. According to a study by Elkhoury, corporate credit ratings “enhance access to private capital markets and lower debt issuance interest costs... helps foster FDI, promote local capital markets, increase public-sector financial transparency...”.⁹⁴ A study by Kraeussl notes that “In nowadays global financial markets, a credit rating can provide access to international capital, for instance, in debt markets where the issuer is not well-known or where investors may not be familiar with the issuer’s language, its business culture or its accounting standards.”⁹⁵ On the other hand, credit ratings can also be procyclical and over-reactive, exacerbating financial crises.⁹⁶ To engage with these risks, IOSCO released a CRA Code of Conduct in 2004, revised the Code again in 2008 after the financial crisis and proposed further revisions in February 2014.⁹⁷

Given the recognised role and influence of Credit Rating Agencies on local financial markets, some commentators propose that the existence of credit rating services for corporate bonds (both local and international) could be at least one important determinant of the level of corporate bond market development in emerging markets.⁹⁸ In IOSCO’s 2002 report on corporate bond market development in emerging markets, it was noted that the “a well-functioning credit rating system increases the transferability of corporate bonds, either in the primary or in the secondary market, and helps to foster growth of depth and liquidity in the corporate bond market.”⁹⁹ The report also noted that well developed credit rating services for corporates can help firms operating in emerging markets to overcome the ‘sovereign ceiling’ effect.¹⁰⁰

Building on this previous analysis, the author of this report have gathered data from one of the largest global Credit Rating Agencies: Moody’s on the date of provision of corporate credit rating services in a number of EMs.

⁹⁴ Ibid.

⁹⁵ Roman Kraeussl, “Do Credit Rating Agencies Add to the Dynamics of Emerging Market Crises?”, CFS Working Paper, 2003

⁹⁶ Both papers: Roman Kraeussl, “Do Credit Rating Agencies Add to the Dynamics of Emerging Market Crises?”, CFS Working Paper, 2003; Marwan Elkhoury, “Credit Rating Agencies and Their Potential Impact on Developing Countries” UNCTAD, 2008 also make this counter case.

⁹⁷ According to the Code of Conduct document, the code is “intended to offer a set of robust, practical measures as a guide to and a framework for CRAs with respect to protecting the integrity of the rating process, ensuring that investors and issuers are treated fairly, and safeguarding confidential material information provided them by issuers.”

⁹⁸ See for example Pipat Luengnaruemitchai and Li Lian Ong, “An Anatomy of Corporate Bond Markets: Growing Pains and Knowledge Gains”, IMF Working Paper, 2005; Robert Dekle, Mahmood Pradhan, “Financial Liberalization and Money Demand in Asean Countries”, IMF Working paper, 1997; Ilhyock Shim, “Development of Asia-Pacific corporate bond and securitisation markets”, BIS Paper states: “Countries including China, India, Japan, Korea, Malaysia and Thailand have active local credit rating agencies, many of which were set up under governmental initiatives or in joint ventures with large international rating agencies. The existence of these local credit rating agencies has supported the issuance of corporate bonds in the region.” (pg 6)

⁹⁹ IOSCO, “The Development of Corporate Bond Markets in Emerging Market Countries”, Growth and Emerging Markets Committee (formerly The Emerging Markets Committee), May 2002.

¹⁰⁰ The sovereign ceiling effect refers to a situation where no private firm in a country can receive a higher rating than that of the sovereign.

Figure 15 compares this data with the relative size of domestic and international corporate bond markets in 2013. The data reveals, that with some exceptions, those EMEs where credit rating services were offered a longer time ago, tend to have larger domestic and/or international corporate bond markets. Conversely, those EMEs with absent or micro markets either have not have international credit rating services available, or they became available very recently. At the same time, this data does not include information from other large and internationally recognized credit rating agencies, nor local credit rating agencies, which could shed more light on how the provision of credit rating services in EMEs relates to corporate bond market development. Further research could add to this database.

Figure 15: Moody's provision of credit rating services for corporate debt, by country

Country	Estimate of the start of provision of corporate debt rating services	Domestic Corporate bond market size (2013)	International Corporate bond market size (2013)	Type
India		1964 Established Market	Developing Market	
Bermuda		1980 Absent Market	Medium-Sized market	
Argentina		1982 Developing Market	Small Market	
Israel		1986 Medium-Sized	Developing Market	
China		1988 Established Market	Medium-Sized market	Pref stock
Liberia		1989 Absent Market	Micro Market	
Mexico		1991 Established Market	Established Market	
Venezuela		1992 Absent Market	Developing Market	
Brazil		1992 Established Market	Established Market	
Korea		1992 Established Market	Established Market	
Chile		1993 Developing Market	Medium-Sized market	
Malaysia		1993 Established Market	Medium-Sized market	
Indonesia		1994 Developing Market	Developing Market	
Phillipines		1994 Small Market	Developing Market	
South Africa		1995 Medium-Sized	Developing Market	
Columbia		1995 Small Market	Developing Market	*str 1981
Qatar		1996 Absent Market	Developing Market	
Thailand		1996 Established Market	Developing Market	IR
Panama		1996 Absent Market	Small Market	
Bahamas		1997 Absent Market	Developing Market	IR
Russia		1997 Established Market	Medium-Sized market	
Mauritius		1997 Absent Market	Micro Market	
Dominican Republic		1997 Micro Market	Small Market	
Lithuania		1998 Micro Market	Absent Market	MTN
Czech Republic		1998 Developing Market	Developing Market	CFR
Poland		1998 Medium-Sized	Small Market	
Cyprus		1998 Small Market	Small Market	
Hungary		1999 Absent Market	Developing Market	1st mtge bonds
Slovakia		1999 Small Market	Small Market	CFR/IR
Uruguay		2000 Absent Market	Absent Market	IR
Kazakhstan		2000 Small Market	Developing Market	
Turkey		2000 Small Market	Medium-Sized market	CFR/IR
Croatia		2000 Micro Market	Small Market	CFR
El Salvador		2001 Absent Market	Micro Market	
Romania		2001 Micro Market	Micro Market	
Oman		2001 Absent Market	Small Market	BCF
Trinidad & Tobago		2001 Absent Market	Small Market	
Estonia		2002 Absent Market	Small Market	
Ukraine		2002 Micro Market	Small Market	
Latvia		2004 Micro Market	Micro Market	
Guatemala		2004 Absent Market	Small Market	
Chinese Taipei		2004 Established Market	Small Market	
Bulgaria		2004 Small Market	Small Market	
Pakistan		2006 Micro Market	Absent Market	IR
Peru		2006 Small Market	Developing Market	IR
UAE		2006 Medium-Sized	Medium-Sized market	
Barbados		2006 Absent Market	Small Market	
Jamaica		2006 Absent Market	Small Market	Pref stock
Egypt		2007 Small Market	Absent Market	
Bahrain		2007 Absent Market	Small Market	CRF
Costa Rica		2007 Absent Market	Small Market	
Kuwait		2007 Absent Market	Small Market	
Saudi Arabia		2007 Developing Market	Small Market	*str 1990
Slovenia		2007 Micro Market	Small Market	
Malta		2009 Small Market	Micro Market	MTN *str 2008
Vietnam		2010 Micro Market	Micro Market	IR
Azerbaijan		2010 Absent Market	Small Market	
Paraguay		2012 Absent Market	Small Market	
Cuba	NA	Absent Market	Absent Market	
Ghana	NA	Absent Market	Absent Market	
Iran	NA	Absent Market	Absent Market	
Serbia and Montenegro	NA	Absent Market	Absent Market	
Lebanon	NA	Absent Market	Small Market	
Sri Lanka	NA	Absent Market	Small Market	
Morocco	NA	Micro Market	Small Market	
Nigeria	NA	Micro Market	Small Market	
Tunisia	NA	Micro Market	Small Market	

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Note: The data has been prepared at IOSCO's request but was not subject to a formal due diligence process; therefore, the data is provided without representations or warranties of any kind and Moody's disclaims all liability in connection therewith.

The data has been prepared solely for the non-commercial use by IOSCO in its research capacity.

Note 1: CFR = Corporate Family; str = short term rating; IR = Issuer Rating; BCF = Bank Credit Facility; MTN = Medium Term Note

Note 2: Domestic and International corporate bond market size groupings in this table come from IOSCO Research Department analysis.

Chapter 4 – The Nature of Corporate Bond Market Activity in Emerging Markets

This section of the report presents and analyzes data on corporate bond issuance, issuers and secondary markets across the EME regions. Issuance volume includes both domestic and international issuances, unless otherwise indicated. Data in these sections is presented by region. Country specific trends and insights are also provided where relevant.

4.1 Issuance Activity and Importance

✧ *Corporate bond market activity can be measured as the value of issuance in a given period. Corporate bond market activity as a percentage of GDP provides some insight into the importance of that activity in an economy. Although this importance indicator is generally very small, especially since activity is a flow indicator, tracking this indicator can provide insight on trends and country comparisons.*

Other useful indicators include average deal size, issuer concentration, bonds issued on international markets (i.e. issued on at least two markets), and market type (publicly placed, privately placed or by auction).

Total corporate bond issuance from EMEs has been growing steadily since 2000, reaching \$1.06 trillion in 2014. Total issuance since the onset of the crisis (2007-2014) is nearly 6 times as large as total issuance in the seven years preceding the crisis (2000-2006). Between 2000 and 2006, EME issuances amounted to \$847 billion. The top 8 EME issuers during this period were South Korea (\$216 billion), Russia (\$89 billion), Brazil (\$65 billion), Mexico (\$58 billion), Chinese Taipei (\$53 billion), China (\$52 billion), Malaysia (\$39 billion) and India (\$33 billion). These ten economies accounted for almost 81% of all EM issuances during this period.

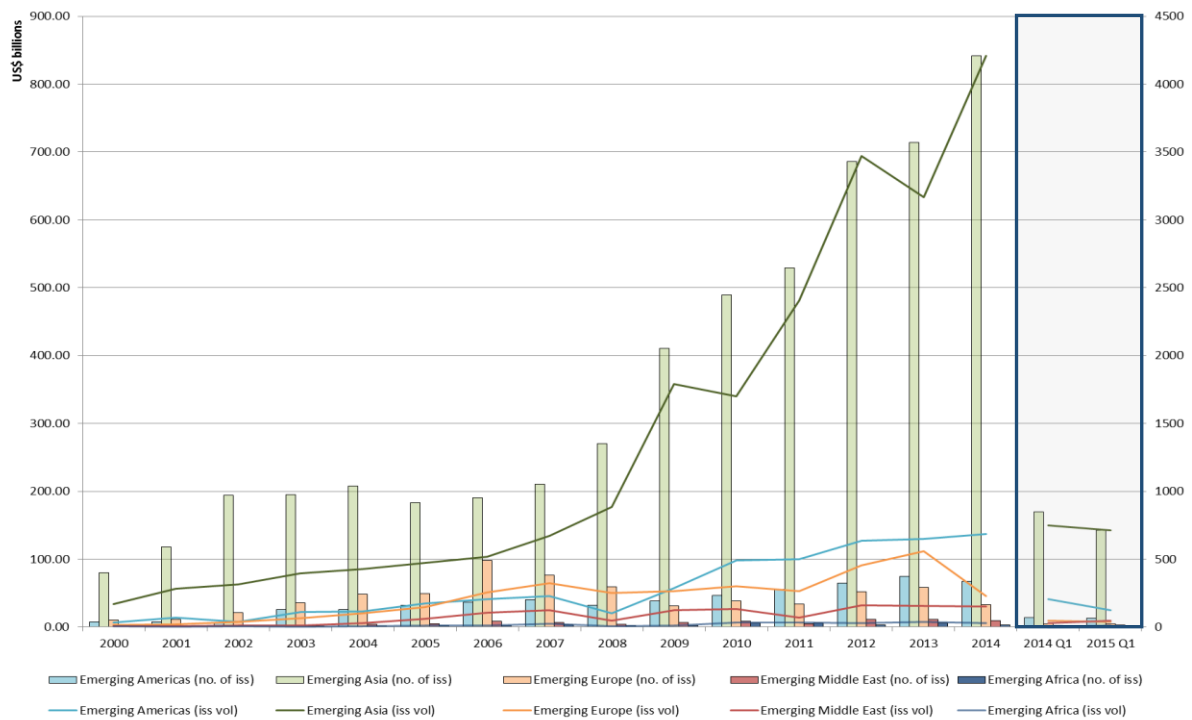
After the onset of the crisis, total EME issuances increased with total issuances amounting to \$5.2 trillion between 2007 and 2014. The top 10 EM issuers have remained largely the same, although now led by China and with the introduction of Thailand: China (\$2.2 trillion), South Korea (\$655 billion), Russia (\$390 billion), Brazil (\$297 billion), India (\$242 billion), Mexico (\$225 billion), Malaysia (\$126 billion) and Thailand (\$118 billion). Thailand's surge in bond issuance may be due to the recent allowance of the sale of unrated bonds to certain investors.¹⁰¹

Issuance has picked up across all regions, particularly in Emerging Asia. However, in 2014, issuance almost halved compared to the previous year in Emerging Europe. From a regional perspective, Figure 16 shows that between 2000 and 2014, corporate bond issuances from Emerging Asia have dominated, with the gap widening even further after the onset of the crisis. Issuances from Emerging Asia reached \$841 billion in 2014. Nevertheless, issuances from the other regions have also experienced growth. Issuance from Emerging Americas reached \$137 billion in 2014. In Emerging Europe, growth slowed after the most recent financial crisis with issuance volume dropping 20% between 2007 and 2008. Growth in issuance recovered quickly peaking at \$112 billion

¹⁰¹ Asian Bond Monitor, 'Thailand – Update', 2012 [see: http://asianbondsonline.adb.org/thailand/market_summary/th_market_summary_201209.pdf]

in 2013 before almost halving to just \$46 billion in 2014. In Emerging Middle East, issuance volume reached \$30 billion in 2014 and in Emerging Africa issuance volume reached just \$6 billion.

Figure 16: Issuance volume and number - by region



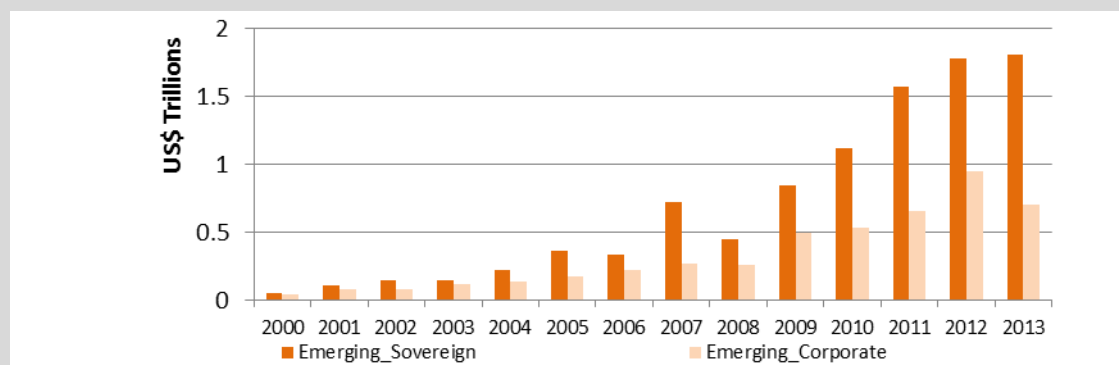
Source: Dealogic

In aggregate, EME sovereign bond issuance is higher than corporate bond issuance, although both are upward trending. In the first volume of this report series, corporate and sovereign bond issuance from emerging markets were compared. Box 1 provides an excerpt from that analysis.

Box 1: Sovereign vs Corporate issuance

While government bond issuance has been high on historical levels, there is little evidence that this is crowding out productive investment through corporate bond markets. Figure 17 compares sovereign and corporate issuance levels in emerging markets. It shows clearly that sovereign issuances have made up the majority of issuances over the last decade. In 2013, sovereign issuances reached \$1.8 trillion representing 72% of total emerging market issuances. However, corporate issuances have also been steadily increasing over the last decade. In fact the CAGR of sovereign and corporate issuances has been similar in the post crisis period. Before the crisis (2004-2007) the CAGR for sovereign issuances was 34% and 19% for corporate issuances. After the crisis, the CAGR reduced to 14% for sovereign issuances but stayed at 19% for corporate issuances. This suggests that in emerging markets, increased sovereign debt issuance is not hindering, and in fact may be supporting, increased corporate debt issuance.

Figure 17: Sovereign vs. corporate bond issuance – Emerging Markets

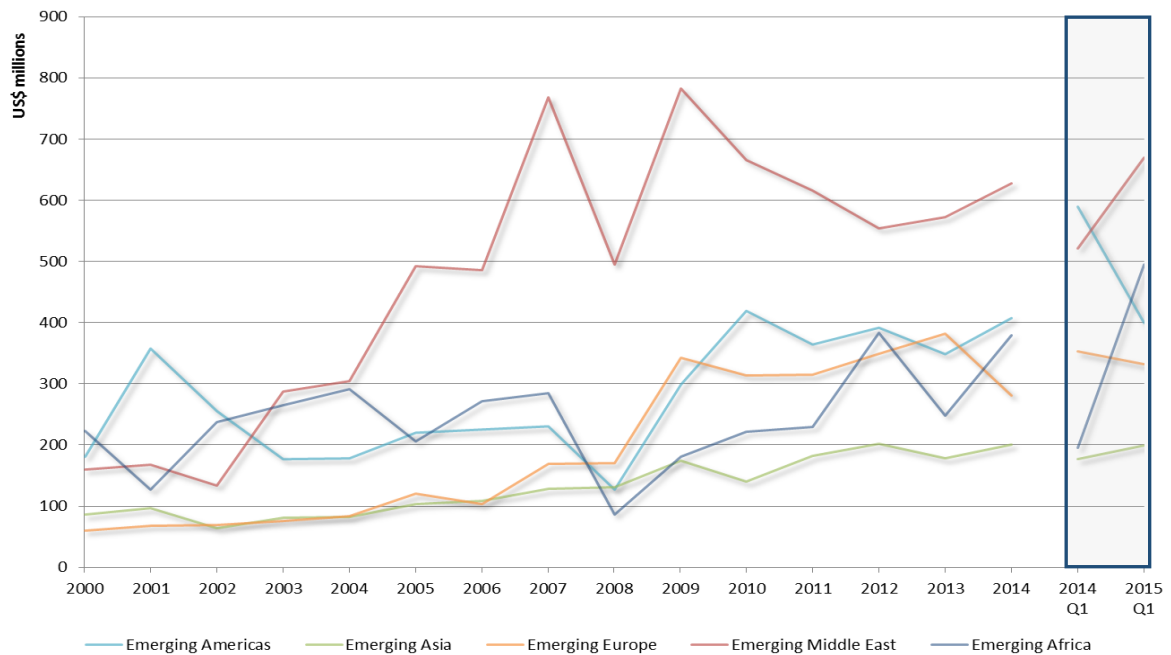


Source: Dealogic (Corp), Bloomberg (Sov), issuance volumes. Note: 2013 figure as of 30 September 2013.

Source: Excerpt from Tendulkar, Hancock, "Corporate Bond Markets: A Global Perspective", 2014

Average deal size across the three EME regions is over \$100 million and is especially large in Emerging Middle East. In Emerging Asia, Africa, Europe and Americas the average deal size has remained below \$500 million, although on an upward trend since the financial crisis (see Figure 18). In Emerging Middle East, the average deal size reached \$628 million in 2014. A small average deal size can be reflective of small issuers dominating the market. Growth in the average deal size signals participation of larger firms and also facilitates a liquid secondary market. This is because institutional investors and brokers prefer to deal and trade in large block sizes, due to the high transaction costs involved in trading bonds.

Figure 18: Average deal size



Source: Dealogic

Note: Average deal size calculated as Issuance volume over number of issues at year end.

In nearly all EMEs, the importance of corporate bond market activity (measured as issuance volume over GDP) has improved, when comparing the period 2000-2006 and 2007-2014. Figure 19 provides a ranking of EMEs in terms of the importance of their corporate bond market activity in the economy. This ranking is categorized within broad regional groupings and compares two time periods: before the crisis (2000-2006) and after the crisis (2007-2014). Comparing the seven years before the crisis with the eight years after reveals that most EMEs have seen an increase in the importance of their corporate bond market activity in their respective economies. The exceptions are Estonia, Kuwait, Hungary, Bulgaria, Latvia, Lebanon, Romania, Jordan and Uzbekistan.

Nevertheless, for the majority of EMEs, the importance of corporate bond market activity in the economy remains less than 1%. For the period 2007-2014, the top 10 EMEs in each region tend to have their importance indicators greater than 1%, while the rest have importance indicators less than 1%.

Figure 19: Ranking– corporate bond market issuance as a % of GDP (average)

EMEA	2000-2006	2007-2014	Americas	2000-2006	2007-2014	Asia Pacific	2000-2006	2007-2014
United Arab Emirates	1.67%	3.47%	Jamaica	1.27%	8.11%	Marshall Islands	0.00%	20.95%
Kazakhstan	4.33%	3.16%	Bahamas	2.51%	3.92%	South Korea	4.30%	7.03%
Russia	1.90%	2.86%	Chile	1.93%	3.55%	Malaysia	4.63%	5.90%
Bahrain	2.63%	2.65%	Mexico	1.03%	2.43%	Thailand	1.98%	4.41%
Qatar	2.46%	2.59%	Columbia	0.02%	1.84%	China	0.36%	3.47%
Georgia	0.00%	1.80%	Barbados	0.49%	1.81%	Chinese Taipei	2.26%	2.60%
Slovenia	0.93%	1.18%	Brazil	1.19%	1.76%	Philippines	1.14%	1.90%
Israel	0.37%	1.14%	Venezuela	0.13%	1.60%	Mongolia	0.00%	1.84%
Czech Republic	0.33%	1.12%	Peru	0.06%	1.53%	India	0.61%	1.79%
South Africa	0.63%	1.02%	Trinidad and Tobago	0.79%	1.07%	Indonesia	0.70%	0.84%
Ukraine	0.63%	0.88%	Costa Rica	0.08%	0.65%	Sri Lanka	0.00%	0.44%
Togo	0.00%	0.85%	Guatemala	0.03%	0.62%	Vietnam	3.00%	0.37%
Saudi Arabia	1.19%	0.82%	Paraguay	0.00%	0.46%	Kenya	0.00%	0.10%
Croatia	0.44%	0.69%	Panama	0.34%	0.42%	Laos	0.00%	0.07%
Slovak Republic	0.46%	0.57%	El Salvador	0.00%	0.42%	Bangladesh	0.00%	0.03%
Turkey	0.09%	0.56%	Argentina	0.17%	0.39%	Jordan	0.28%	0.00%
Estonia	0.63%	0.56%	Dominican Republic	0.34%	0.38%	Kyrgyzstan	0.00%	0.00%
Poland	0.32%	0.47%	Uruguay	0.00%	0.19%	Uzbekistan	0.02%	0.00%
Kuwait	0.73%	0.47%	Ecuador	0.00%	0.16%			
Azerbaijan	0.00%	0.46%						
Hungary	0.43%	0.42%						
Morocco	0.00%	0.37%						
Bulgaria	0.54%	0.33%						
Oman	0.15%	0.31%						
Latvia	0.31%	0.28%						
Serbia	0.00%	0.28%						
Lebanon	0.87%	0.26%						
Nigeria	0.00%	0.17%						
Ethiopia	0.00%	0.13%						
Lithuania	0.00%	0.12%						
Egypt	0.09%	0.10%						
Botswana	0.00%	0.07%						
Belarus	0.00%	0.05%						
Tunisia	0.00%	0.01%						
Romania	0.18%	0.00%						

Source: Dealogic, World Bank, IOSCO Research Department calculations

Note: Ranked according to total for period 2007-2014

Issuer concentration is high across EMEs, with Emerging Asia markets generally seeing less concentration than those in Emerging Europe, Middle East and Africa (EMEA) and Emerging Americas. Figure 20 presents a measure of issuer concentration by country and categorized by broad region. To measure issuer concentration, the issuances of the top ten issuers in each market is measured against total issuance in that market for the period 2010-2014. On average, issuer concentration in Emerging Asia is around 66%, in the Americas it is around 87% and in EMEA it is around 93%.

In EMEA only Russia has corporate bond markets where the top 10 issuers represent less than half of total issuance over the last five years (44%). In the Americas, only in Brazil do the top 10 issuers represent less than half of total issuances (39%). In Chile (52%) and Peru (56%) issuer concentration is also relatively low considering the size of these markets. In the Asia Pacific region, a number of emerging markets show relatively low issuer concentration, including China (15%), South Korea (28%), Hong Kong (32%), India (40%), Thailand (43%), Philippines (44%) and Malaysia (44%).

In general, those EMEs with larger corporate bond markets tend to have lower issuer concentration. As issuer concentration dilutes, the sustainability of corporate bond market functioning increases. This is because reduced issuer concentration implies the emergence of a wider and diverse issuer base, where corporate bond markets are tapped into by a range of different firms. As such, issuer concentration can also be used as a proxy for the importance of corporate bond market financing in an economy.

Figure 20: Ranking – issuer concentration

Top 10 percentage of total	(2010-2014)	Top 10 percentage of total	(2010-2014)	Top 10 percentage of total	(2010-2014)
EMEA (region)	93%	Americas (Region)	87%	Asia Pacific (region)	66%
Morocco	100%	Venezuela	100%	Macao	100%
Azerbaijan	100%	Bahamas	100%	Bangladesh	100%
Belarus	100%	Barbados	100%	Laos	100%
Botswana	100%	Costa Rica	100%	Marshall Islands	100%
Bulgaria	100%	Ecuador	100%	Mongolia	100%
Croatia	100%	Guatemala	100%	Pakistan	100%
Estonia	100%	Jamaica	100%	Sri Lanka	100%
Ethiopia	100%	Paraguay	100%	Vietnam	100%
Latvia	100%	Puerto Rico	100%	Chinese Taipei	55%
Lebanon	100%	Trinidad and Tobago	100%	Indonesia	51%
Lithuania	100%	Uruguay	100%	Malaysia	44%
Serbia	100%	Dominican Republic	100%	Philippines	44%
Togo	100%	El Salvador	100%	Thailand	43%
Oman	100%	Panama	100%	Singapore	43%
Slovenia	100%	Colombia	67%	India	40%
Slovak Republic	100%	Mexico	66%	Hong Kong	32%
Bahrain	100%	Argentina	62%	South Korea	28%
Kuwait	100%	Peru	56%	China	15%
Hungary	100%	Chile	52%		
Georgia	100%	Brazil	39%		
Egypt	100%				
Ukraine	99%				
Czech Republic	99%				
Qatar	98%				
Israel	94%				
Nigeria	93%				
Kazakhstan	91%				
Saudi Arabia	80%				
Poland	77%				
Turkey	75%				
South Africa	68%				
United Arab Emirates	59%				
Russian Federation	44%				

Source: Dealogic

Note: region figures are averages

In Emerging EMEA and Emerging Americas, the majority of issuance from EMEs has been offered on international markets. However in Emerging Asia, most of the issuance is offered on domestic markets only. Tapping into domestic and international corporate bond markets provide different benefits, with these markets acting as complements for EME firms in meeting financing needs. A study by the World Bank¹⁰² suggests that the bonds issued by firms on international markets differ from those issued on domestic markets, even if they are issued by the same firm e.g. international bonds are larger in size, shorter in terms of maturity, often denominated in foreign currency and based on a fixed rate contract. Furthermore, these bonds tend to offer lower yields, and are thus of lower cost. As such, while issuance on the domestic market is important, in some cases, access to international markets can help lower costs of issuance and provide access to capital market financing where local markets are thin.

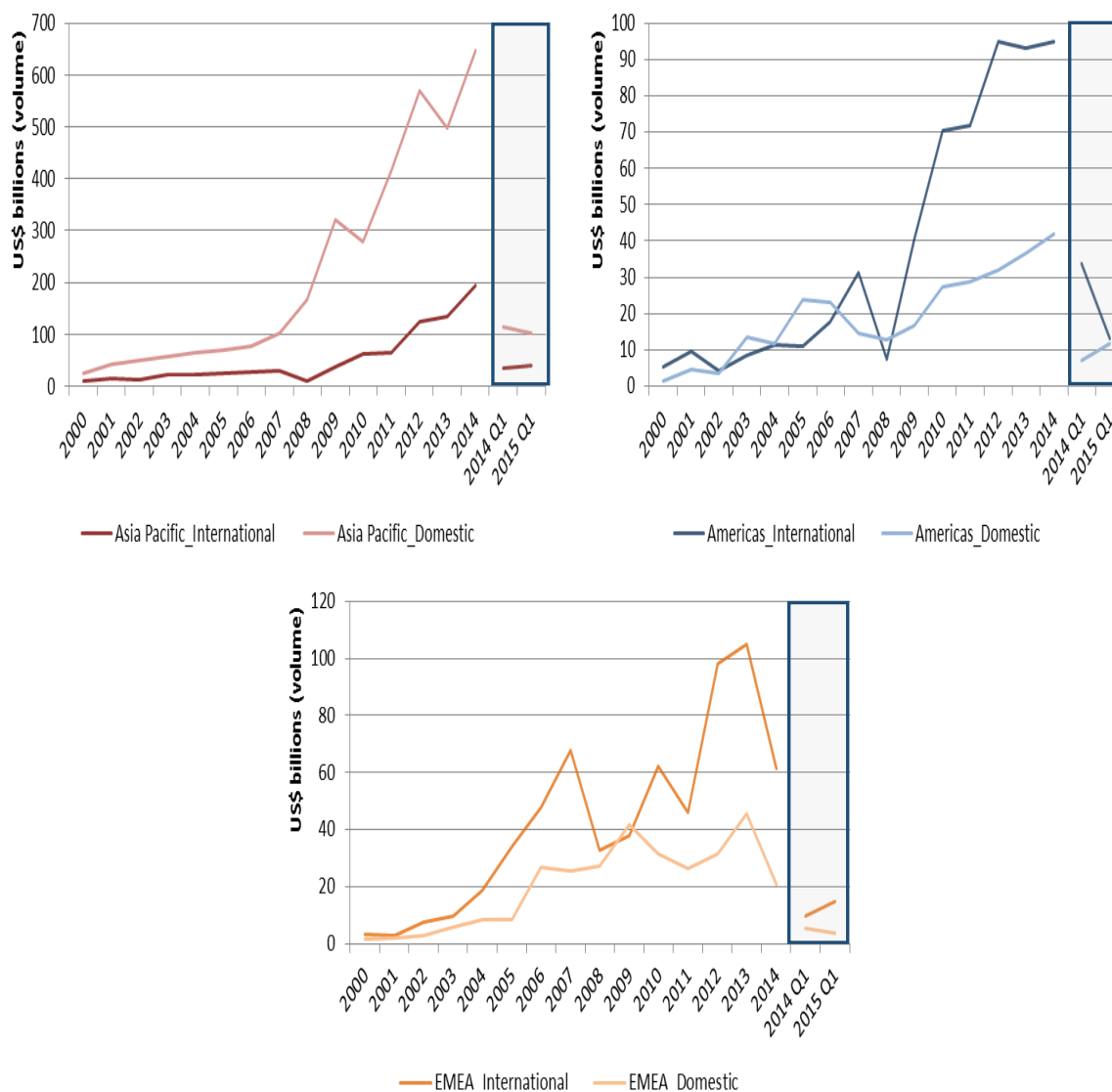
Figure 21 separates corporate bond issuance on international markets vs. domestic markets. In 2014, international market issuance in the Americas reached \$110 billion, \$67 billion in EMEA and \$194 billion in the Asia Pacific region. In contrast, domestic market issuance reached just \$44 billion in the Americas and \$21 billion in EMEA, but reached a relatively large volume size of \$649 billion in the Asia Pacific region.

Between 2000 and 2007, domestic market issuance grew faster than for those offered on international markets in the Americas (36% vs. 25% CAGR) and Asia Pacific (20% vs. 15%). In EMEA international market issuance grew marginally faster than domestic market issuance (46% vs 41% CAGR). After the financial crisis, growth in both international and domestic market issuance across

¹⁰² Juan Carlos Gozzi, Ross Levine, Maria Soledad Martinez Peria, Sergio L. Schmukler, “How Firms Use Domestic and International Corporate Bond Markets”, *World Bank Policy Research Paper*, September 2012.

the regions pulled back slightly, with the exception of in Asia Pacific. In Americas, growth was 17% for issuance on the international market and 15% for issuance on the domestic market. In the Asia Pacific, the growth rate of domestic and international market issuance converged at 26% CAGR. In EMEA, both domestic and international market issuance declined with the former declining at a greater rate (-3% vs -1.2%).

Figure 21: Issuances on international vs. domestic markets



Source: Dealogic

Note: International issuances refer to issuances on more than one market.

The preponderance of domestic only issuance over international issuance in Asia may in part be due to restrictions on international issuance in some of the larger Asian markets.¹⁰³ Figure 22 shows that for some of the largest corporate bond markets in Asia, issuance over the last 5 years has been almost exclusively on the domestic market e.g. Chinese Taipei, Malaysia, China, South Korea and Thailand. In contrast in the EMEA and Americas markets, the larger corporate bond markets issuer countries, have a majority of issuance on the international markets e.g. Russia, South Africa,

¹⁰³ In South Korea, foreign participation in bond markets was excluded until 1994. In 2007 in China, restrictions were relaxed to allow 'dim sum' bonds (Remnimbis denominated bonds issued in Hong Kong). In 2012, restrictions were lifted for international investors seeking to buy bonds on the interbank market.

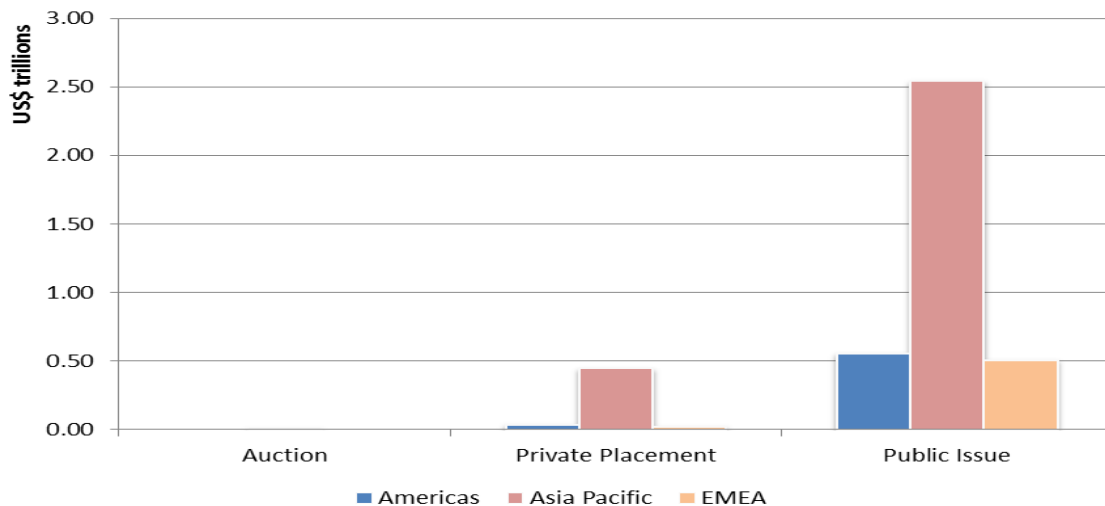
UAE, Brazil, Mexico, Chile. The smallest markets across the region tend to have no domestic market issuance, reflecting the under-developed nature of local corporate bond markets in those countries.

Figure 22: Issuances on international markets vs domestic only for 2010-2014

Int vs. dom markets (2010-2014)	Int mkt	Dom mkt only	Int vs. dom markets (2010-2014)	Int mkt	Dom mkt only	Int vs. dom markets (2010-2014)	Int mkt	Dom mkt only
EMEA (region)	92%	8%	Americas (Region)	87%	13%	Asia Pacific (region)	57%	43%
Egypt	34%	66%	Venezuela	38%	62%	Pakistan	0%	100%
Saudi Arabia	50%	50%	Argentina	53%	47%	Chinese Taipei	6%	94%
Russian Federation	50%	50%	Colombia	66%	34%	Malaysia	14%	86%
Bahrain	59%	41%	Mexico	66%	34%	China	14%	86%
Georgia	80%	20%	Brazil	77%	23%	South Korea	15%	85%
South Africa	85%	15%	Chile	78%	22%	Thailand	17%	83%
Nigeria	86%	14%	Dominican Republic	83%	17%	India	31%	69%
Israel	89%	11%	Bahamas	89%	11%	Philippines	41%	59%
Czech Republic	96%	4%	Peru	96%	4%	Vietnam	66%	34%
Kazakhstan	98%	2%	Panama	100%	0%	Indonesia	66%	34%
Turkey	99%	1%	El Salvador	100%	0%	Singapore	70%	30%
United Arab Emirates	99%	1%	Barbados	100%	0%	Macao	92%	8%
Poland	100%	0%	Costa Rica	100%	0%	Hong Kong	93%	7%
Qatar	100%	0%	Ecuador	100%	0%	Sri Lanka	100%	0%
Ukraine	100%	0%	Guatemala	100%	0%	Bangladesh	100%	0%
Hungary	100%	0%	Jamaica	100%	0%	Laos	100%	0%
Kuwait	100%	0%	Paraguay	100%	0%	Marshall Islands	100%	0%
Slovak Republic	100%	0%	Puerto Rico	100%	0%	Mongolia	100%	0%
Oman	100%	0%	Trinidad and Tobago	100%	0%			
Slovenia	100%	0%	Uruguay	100%	0%			
Azerbaijan	100%	0%						
Belarus	100%	0%						
Botswana	100%	0%						
Bulgaria	100%	0%						
Croatia	100%	0%						
Estonia	100%	0%						
Ethiopia	100%	0%						
Latvia	100%	0%						
Lebanon	100%	0%						
Lithuania	100%	0%						
Serbia	100%	0%						
Togo	100%	0%						
Morocco	100%	0%						

The majority of EME corporate bonds over the last five years have been publically placed. Figure 23 shows that between 2010 and 2014 in EMEA, 94% of corporate bonds were publically placed compared to 6% privately placed. In Asia Pacific, 85% of bonds were publically placed, compared with 15% privately placed. Finally, in the Americas, 88% of corporate bonds were publically placed compared to 12% private placement. Nevertheless, in Asia Pacific just shy of \$0.5 trillion of issuance between 2010 and 2014 have been through private placement, dwarfing similar practices in other emerging market regions. This may be attributable to private rebate schemes proliferating in Asia (see Box 2).

Figure 23: Placement type - total issuance between 2010 and 2014



Source: Dealogic

Box 2: Private rebates for high yield and US denominated debt in Asia

In Asia, anecdotal evidence suggests high yield firms issuing bonds are participating in private rebate schemes whereby private bankers are offered a cash bonus (rebate) in return for selling the firm’s high yield bonds to the bank’s clients. This scheme provides an incentive for banks to find buyers for riskier debt. According to a survey by Fidelity,¹⁰⁴ in 2012 60 bonds issued in emerging Asia were sold through the rebate scheme, with total issuance valuing at \$12.5 billion. This compares with only 34 sales in 2011 and just four sales in 2010. According to a report from Bloomberg,¹⁰⁵ in 2013 these rebate schemes increased further in order to incentivize individual investors to buy dollar-denominated bonds, even as returns slumped. Bloomberg reports that around 24% of deals in Q1 of 2013 provided some sort of rebate. A high number of these bonds with private rebates (60%) are issued from the financial and property sectors.

The benefit of these schemes is that they help to encourage investment and mobilize a private investor base, which diversifies the total investor base. These rebate schemes are legal within the current regulatory framework, however concerns are brewing that these rebates are not being disclosed to clients. Furthermore, there are concerns that investors are being encouraged to take on risks they may not understand. In many cases, these bonds are unrated resulting in asymmetric information. Concerns also exist around the “potentially high levels of leverage available to retail investors in these bonds”.¹⁰⁶ Nevertheless, regulators are monitoring this activity and efforts are being focused on increasing disclosure of this practice across the region.

While the volume of corporate bonds privately placed is small in Emerging EMEA and Emerging Americas, the trend has ticked up in the last few years.

Figure 24 tracks trends in issuance/placement type across three regions. While public issuance dominates in Asia Pacific, there were dips in 2010 and 2013. In 2014, publicly issued bonds reached \$697 billion. Private placement has experienced a more steady upward growth trend, reaching \$145 billion in 2014. In the Americas, public issuance has also dominated, dropping in 2008 and 2011 but recovering strongly, reaching

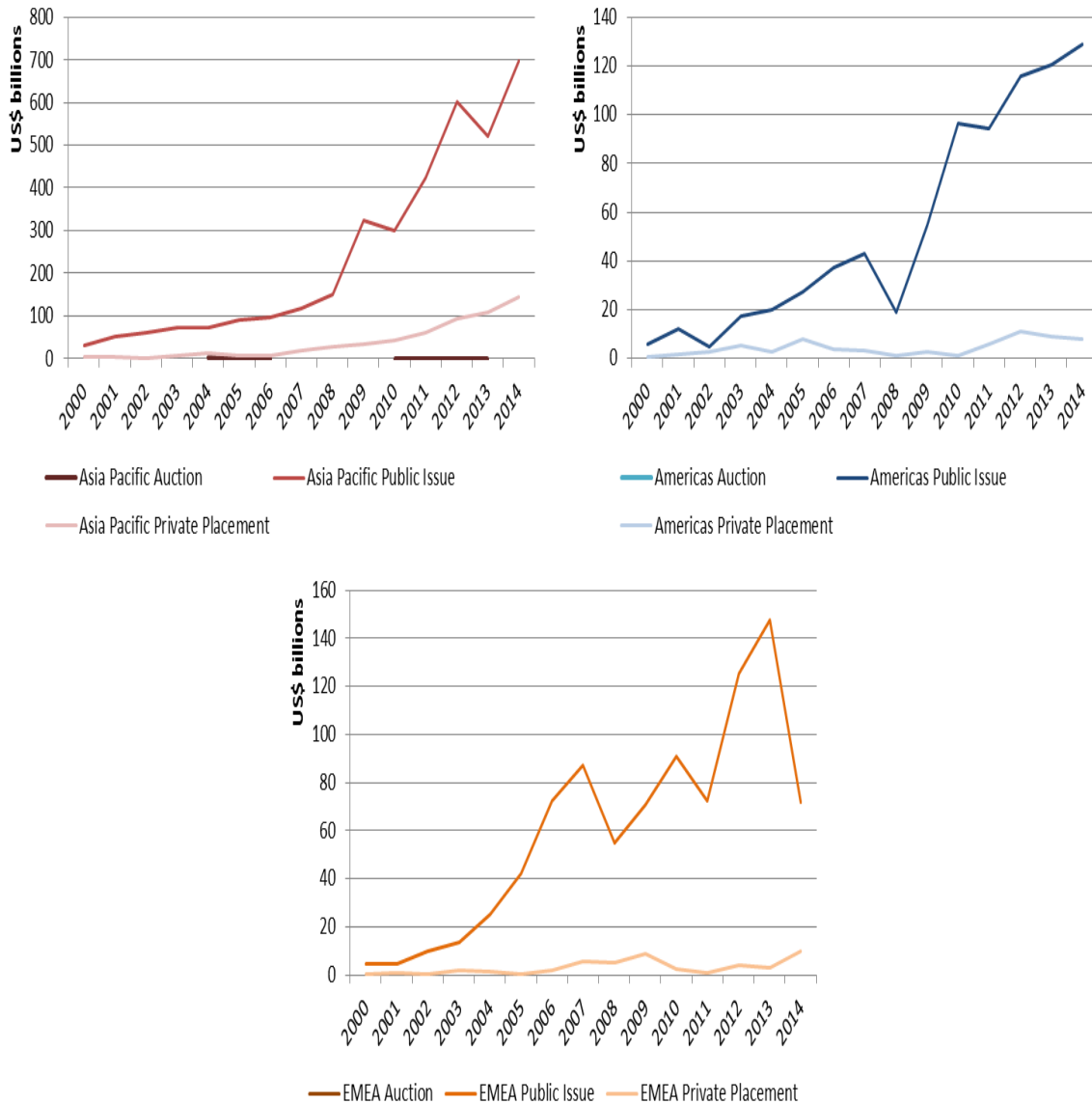
¹⁰⁴ FIL Limited (2012)

¹⁰⁵ Tanya Angerer, BloombergBusiness, “Asia Banks Offer Bond Perks as Returns Dwindle”, April 2013 [see <http://www.bloomberg.com/news/2013-04-23/asia-banks-offer-bond-perks-as-returns-dwindle-credit-markets.html>]

¹⁰⁶ Sabita Prakash, Bryan Collins, “How PB rebates could become a BP (big problema) for investors – guest opinion”, Global Capital, September 2012 [see <http://www.globalcapital.com/article/k36vr3kpq1gf/how-pb-rebates-could-become-a-bp-big-problem-for-investors-guest-opinion>]

\$129 billion in 2014. Private placement has been traditionally small but has been upward trending in the last few years reaching \$8 billion in 2104. In EMEA, public issue also dipped in 2008, 2011 and in 2014, reaching \$72 billion in 2014. Interestingly, while private placement is also very small, private placement ticked up in 2014 to reach almost \$10 billion.

Figure 24: Placement type – issuance trend



Source: Dealogic

Note: extracted using 'market type' filter

4.2 Issuer characteristics

✧ *Firms issuing corporate bonds can come from a variety of segments. From a broad perspective, these segments can be divided as financial or non-financial. Looking more closely, the non-financial segment can be further divided into a greater range of issuer types, including utilities, Oil & Gas, Construction/Building, Real Estate, Telecommunications etc. Trends and details of issuer types are provided in this section in order to offer insight on those actors driving the supply side of corporate bond markets in EMEs.*

Issuance from non-financial firms have been increasing steadily in Emerging Asia and Emerging Americas, dominating the issuer mix. In Emerging EMEA, issuance from EME financial and non-financial firms have converged. Figure 25 presents issuance volumes from both financial and non-financial firms aggregated for three EME regions – EMEA, Americas and Asia Pacific.

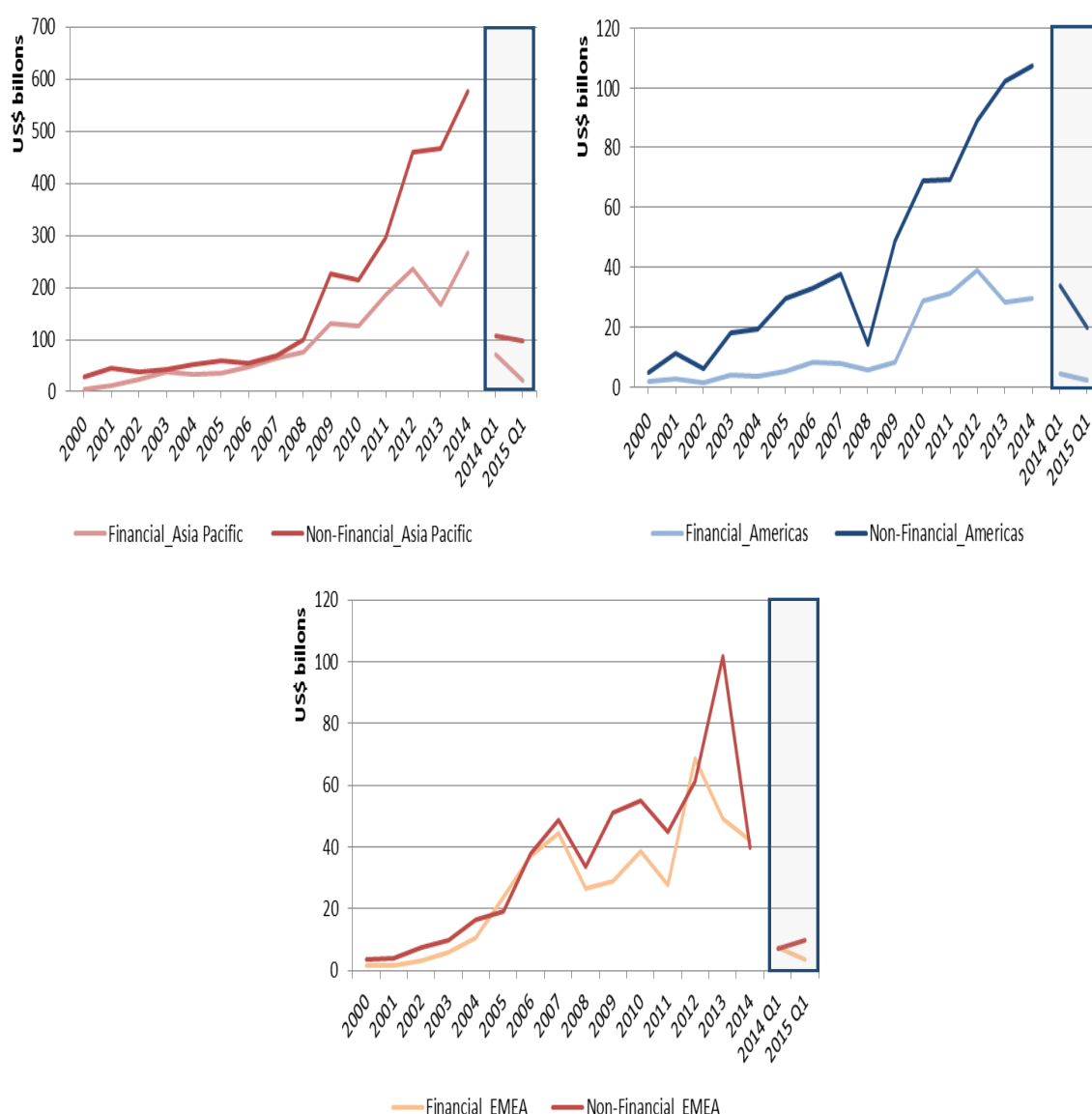
In 2014, issuance from non-financial firms (non-financial issuance) reached \$107 billion in the Emerging Americas, \$576 billion in Emerging Asia and \$40 billion in Emerging EMEA. Issuance from financial firms (financial issuance) reached \$30 billion in the Emerging Americas, \$266 billion in Emerging Asia and \$42 billion in Emerging EMEA. Comparing 2014 Q1 and 2015 Q1, we see a downward trend in financial and non-financial issuance across the regions – with the exception of non-financial issuance from EMEA.

Before the onset of the crisis (between 2000 and 2007), growth in non-financial issuance in Emerging Americas had a 30% CAGR while financial issuance grew at a CAGR of 19%. After the onset of the crisis, growth of financial issuance fell in Emerging Americas to 14% while the CAGR of non-financial issuance shrunk marginally to 18% (CAGR between 2007-2014).

In Emerging Asia, financial issuance grew at a faster rate (36% CAGR) than non-financial issuance (12% CAGR) before the crisis, with volumes from these two issuer groups converging in 2007. After the crisis, both non-financial and financial issuance have seen growth (with a momentary drop of financial issuance in 2013). Since the onset of the crisis, the growth rate of non-financial issuance (30% CAGR) has overtaken the growth rate of financial issuance (19% CAGR). In other words, non-financial issuance are growing at a faster rate than financial issuance.

In EMEA, before the crisis financial issuance grew at CAGR of 52% while non-financial issuance grew at a CAGR of 40%. Non-financial issuance experienced steady growth between 2007 and 2013, however issuance dropped drastically in 2014, below 2007 levels (resulting in a CAGR for the period 2007-2014 of -3%). Meanwhile, financial issuance declined following the onset of the crisis but picked up again in 2012, with a CAGR for the period 2007-2014 of -0.6%.

Figure 25: Non-financial and Financial Issuances



Source: Dealogic

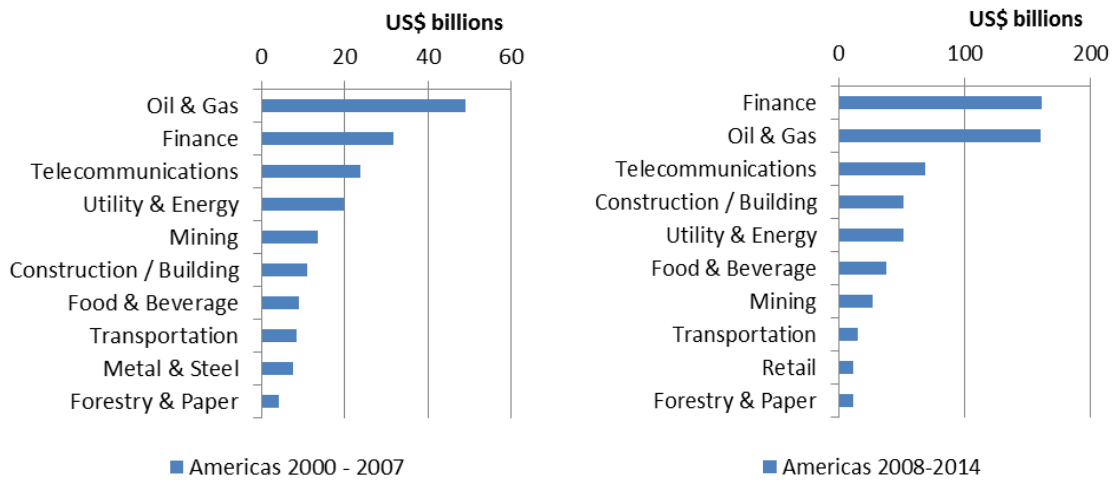
However, a closer look at issuer types reveals that financial issuers still make up one of the largest individual issuer groups across the three regions. Figure 26, Figure 27, Figure 28 present a breakdown of the main issuer groups in EMEs before and after the crisis and across three regions. In Emerging Americas, the mix of issuer types has not changed drastically over the last 15 years. Before the crisis, Oil & Gas issuers dominated, followed by Finance and Telecommunications. Since the onset of the crisis, the top three issuer groups remain the same, with financial firms taking the top spot.

In Emerging Asia, the finance sector is the largest issuer group both before and after the crisis. Before the crisis utility & energy and Telecommunications were also in the top three issuer groups, but after the crisis, telecommunications dropped off to be replaced with construction/building. Real estate/property developers and mining companies have also seen growth across this region.

Similarly in Emerging EMEA, the main issuer type is Finance, followed by Oil & Gas. Transportation had the third top spot before the crisis and Utility and Energy had the third top spot after the crisis. Generally, the mix of issuer types has remained largely the same over the last 15 years, with real

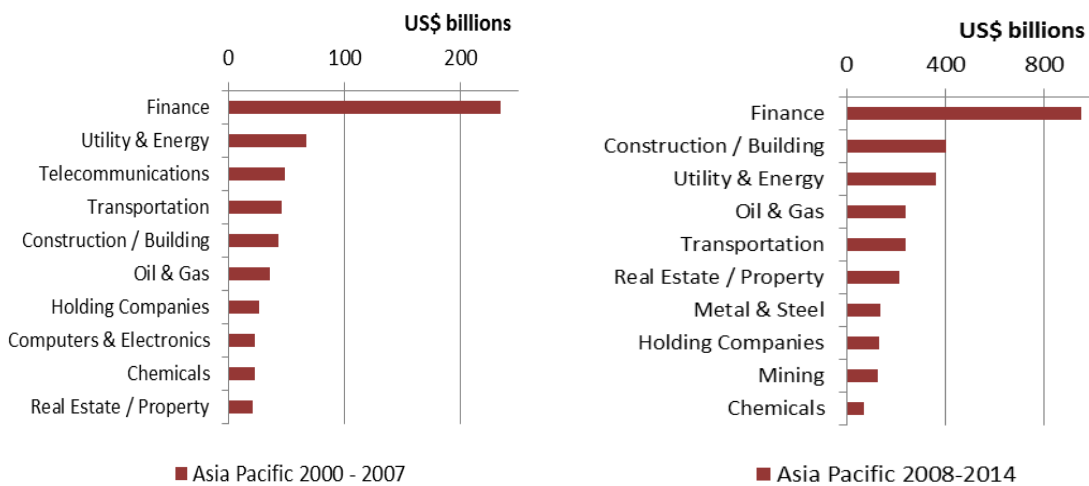
estate/property, mining and healthcare moving up in the rankings and construction/building and food & beverage moving down.

Figure 26: Americas, main issuer types 2000-2007 vs. 2008-2014



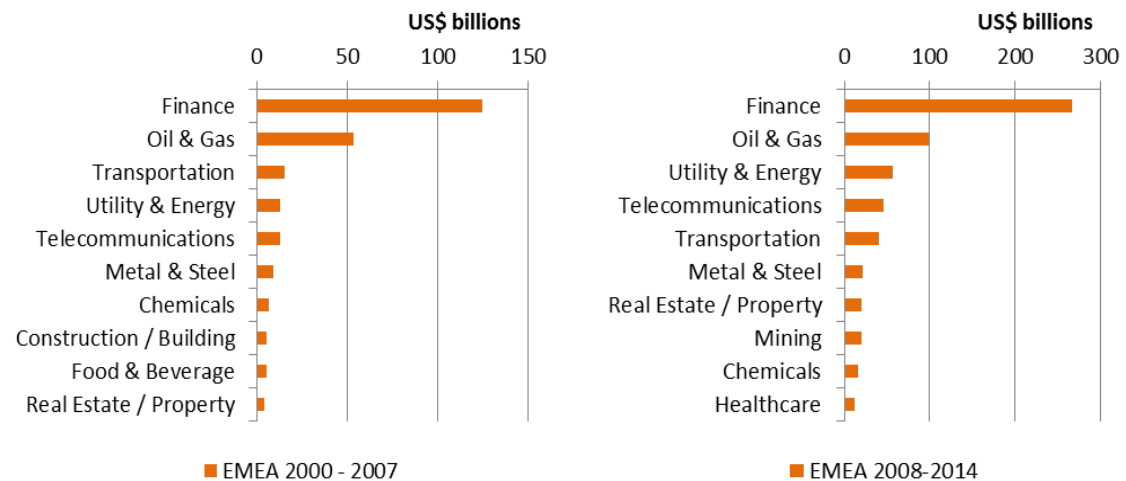
Source: Dealogic

Figure 27: Asia Pacific, main issuer types 2000-2007 vs. 2008-2014



Source: Dealogic

Figure 28: EMEA, main issuer types 2000-2007 vs. 2008-2014



Source: Dealogic

From a country perspective, there is still quite a bit of variability when it comes to the main issuer types. EMEs with relatively large corporate bond markets exhibit high diversity in issuer types, with financial issuers generally leading the charge. There appears to be no general trend for EMEs with smaller corporate bond markets. For some smaller markets all issuance comes from the financial sector. For others, no issuance comes from the financial sector. Figure 29 presents the top three issuer types by country and provides an indicator of concentration of these issuer types in each market.¹⁰⁷ The largest EMEs in terms of corporate bond market size, have a relatively high diversity of issuer types. For example the top three issuer types in China (45%), Brazil (62%), Chile (58%), South Korea (67%), Thailand (60%), Mexico (65%), Russia (70%) are responsible for 70% or less of total issuances in their respective jurisdictions between 2010-2014.

In Emerging Americas, financial issuers feature in the top three issuer types for all EMEs with the exception of the Bahamas, Barbados, Ecuador, Jamaica, Uruguay and Venezuela. In Emerging Asia, only Macao, Laos, Marshall Islands and Bangladesh do not have financial issuers featuring the top three. Croatia, Estonia, Israel, Kazakhstan, Lithuania, Serbia and the Slovak Republic are the only Emerging EMEA jurisdictions where financial issuers are not part of the top three issuers in the country. There are also a number of EMEs for which all issuance between 2010 and 2014 come from financial issuers such as: Panama, Puerto Rico and Trinidad and Tobago in the Americas; and Belarus, Botswana, Ethiopia, Latvia and Togo in EMEA. These findings, along with the trend shown in Figure 25, suggest that financial issuers remain an important part of the corporate bond issuer ecosystem across EMEs. Nevertheless, a range of non-financial issuer types are growing or entering the fray even in jurisdictions where financial issuers are not established.

¹⁰⁷ Here calculated as a low percentage of total issuances from the top three issuer types.

Figure 29: Main issuer types by country (2010-2014)

The Americas			Asia Pacific			EMEA			EMEA (cont.)		
Country	Top 3 issuers (2010-2014)	% of total issuance	Country	Top 3 issuers (2010-2014)	% of total issuance	Country	Top 3 issuers (2010-2014)	% of total issuance	Country	Top 3 issuers (2010-2014)	% of total issuance
Argentina	Oil & Gas Finance Utility & Energy	69%	Bangladesh	Telecommunications -	100%	Azerbaijan	Oil & Gas Finance Transportation	100%	Oman	Finance Transportation Oil & Gas	100%
The Bahamas	Telecommunications Transportation -	100%	China	Finance Construction / Building Utility & Energy	45%	Bahrain	Finance Telecommunications	100%	Poland	Finance Telecommunications Utility & Energy	76%
Barbados	Telecommunications -	100%	Hong Kong	Real Estate / Property Holding Companies Finance	65%	Belarus	Finance -	100%	Qatar	Finance Telecommunications Real Estate / Property	95%
Brazil	Finance Oil & Gas Construction / Building	62%	India	Finance Utility & Energy Oil & Gas	72%	Botswana	Finance -	100%	Russian Federation	Finance Oil & Gas Transportation	70%
Chile	Finance Mining Utility & Energy	58%	Indonesia	Oil & Gas Finance Utility & Energy	63%	Bulgaria	Holding Companies Telecommunications Finance	100%	Saudi Arabia	Utility & Energy Chemicals Finance	85%
Columbia	Finance Oil & Gas Utility & Energy	87%	Laos	Auto / Truck -	100%	Croatia	Food & Beverage Utility & Energy	100%	Serbia	Telecommunications -	100%
Costa Rica	Finance Utility & Energy -	100%	Macao	Leisure & Recreation -	100%	Czech Republic	Utility & Energy Finance Transportation	85%	Slovak Republic	Utility & Energy Construction / Building -	100%
Dominican Republic	Transportation Finance Utility & Energy	100%	Malaysia	Finance Utility & Energy Construction / Building	71%	Egypt	Finance Government Telecommunications	84%	Slovenia	Finance Oil & Gas -	100%
Ecuador	Metal & Steel -	100%	Marshall Islands	Oil & Gas -	100%	Estonia	Utility & Energy Transportation -	100%	South Africa	Finance Mining Utility & Energy	52%
El Salvador	Finance Utility & Energy -	100%	Mongolia	Mining Finance Transportation	100%	Ethiopia	Finance -	100%	Togo	Finance -	100%
Guatemala	Finance Telecommunications Construction / Building	87%	Pakistan	Utility & Energy Transportation -	100%	Georgia	Transportation Finance Auto / Truck	86%	Turkey	Finance Consumer Products Food & Beverage	89%
Jamaica	Telecommunications Construction / Building -	100%	Philippines	Real Estate / Property Finance Utility & Energy	56%	Hungary	Oil & Gas Chemicals Finance	95%	Ukraine	Finance Agribusiness Utility & Energy	62%
Mexico	Oil & Gas Telecommunications Finance	65%	Singapore	Finance Real Estate / Property Transportation	68%	Israel	Healthcare Oil & Gas Utility & Energy	83%	United Arab Emirates	Finance Oil & Gas Real Estate / Property	69%
Panama	Finance -	100%	South Korea	Finance Utility & Energy Oil & Gas	67%	Kazakhstan	Oil & Gas Transportation Agribusiness	84%			
Paraguay	Finance Telecommunications -	100%	Sri Lanka	Finance Transportation	100%	Kuwait	Finance Oil & Gas	100%			
Peru	Finance Utility & Energy Food & Beverage	74%	Taiwan	Finance Utility & Energy Computers & Electronics	66%	Latvia	Finance -	100%			
Puerto Rico	Finance -	39%	Thailand	Finance Oil & Gas Construction / Building	60%	Lebanon	Finance Transportation -	100%			
Trinidad and Tobago	Finance -	100%	Vietnam	Real Estate / Property Finance Construction / Building	88%	Lithuania	Telecommunications -	100%			
Uruguay	Transportation -	100%				Morocco	Chemicals Finance -	100%			
Venezuela	Oil & Gas -	100%				Nigeria	Finance Oil & Gas Telecommunications	92%			

Source: IOSCO Research Department, derived from Dealogic data

4.3 Issuance Trends

✧ *Corporate bond issuance can be classified in a multitude of ways, depending on rating (i.e. perceived risk – high yield or investment grade), the purpose of issuance (e.g. for refinancing), currency (e.g. local or non-local), contractual conditions (e.g. putable or callable) and specialization (e.g. a specialized vehicle such as a Sukuk issuance or issuances used for infrastructure projects). This section presents a number of issuance trends related to these classifications.*

Some defining figures include: Investment grade (IG) issuance in 2014 reached \$799 billion in Emerging Asia, \$106 billion in Emerging Americas and \$65 billion in EMEA. High yield issuance reached just \$43 billion in Emerging Asia, \$31 billion in Emerging Americas and \$17 billion in Emerging EMEA. In total, high yield issuance from emerging markets reached less than \$100 billion (\$91 billion) in 2014.

In Emerging Asia, refinancing issuance soared after 2007, reaching an all-time high of \$221 billion in 2014. In Emerging EMEA before the crisis, issuance for refinancing purposes were negligible but after the onset of the crisis, issuance picked up somewhat reaching \$9 billion in 2014. EMEs in Emerging Americas are the exception. Before the crisis refinancing issuance was growing in volume but dropped off substantially after 2007, reaching a value of \$27 billion in 2014.

In 2014, local currency issuance in Emerging EMEA reached \$20 billion and non-local currency issuance reached \$61 billion. In Emerging Americas local currency issuance reached \$39 billion and non-local currency issuance reached \$98 billion. In Emerging Asia, local currency issuance reached a high of \$673 billion, while non-local currency issuance equated to less than one sixth of that at \$129 billion.

EMEs in Emerging Asia issued \$36 billion worth of putable bonds in 2014. EMEs in Emerging Americas issued no putable bonds in 2014. EMEs in Emerging EMEA issued just shy of \$20 billion worth of putable bonds in 2014. In 2014, Sukuk issuances reached \$11 billion in Emerging Asia and \$12 billion in Emerging EMEA. Issuance from EMEs to finance infrastructure projects has dropped off in the last few years. In Emerging Asia, issuance reached \$3 billion in 2014. In Emerging Americas, issuance of these types of bonds has increased slightly, overtaking issuance from Emerging Asia to reach over \$5 billion.

- **High Yield vs. Investment Grade**

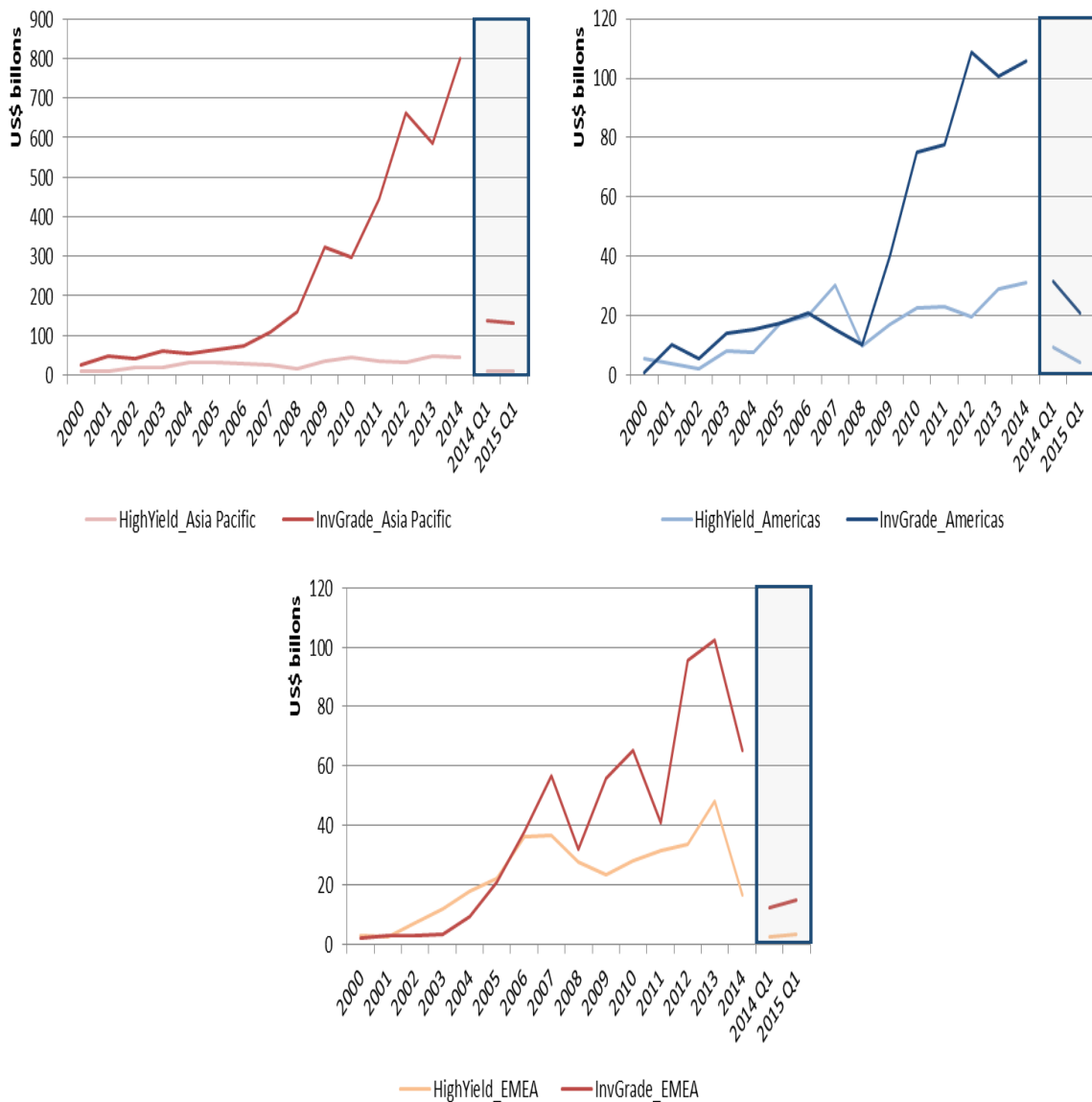
Most of the issuance from EMEs has an investment grade rating. While investment grade issuance has experienced steady and strong growth, growth in high yield issuance from EMEs was more subdued after the onset of the crisis. Figure 30 compares high yield and investment grade issuance from EMEs across three regions. In 2014, IG issuance reached \$799 billion in Emerging Asia, \$106 billion in Emerging Americas and \$65 billion in Emerging EMEA. All regions have shared a general upward trend in IG issuance over the last decade and a half (2000-2014), with a CAGR of 23% in Emerging Americas, 12% in Emerging Asia and 15% in Emerging EMEA. In 2014, the level of high yield issuance hit \$43 billion in the Emerging Asia and \$31 billion in Emerging Americas. In Emerging EMEA, high yield issuance reached just \$17 billion. In total, high yield issuance from emerging markets reached less than \$100 billion (\$91 billion) in 2014.

In Emerging Americas and Emerging EMEA, high yield and IG issuance were at similar volumes before the onset of the crisis. After the onset of the crisis, IG issuance surged, dwarfing high yield

issuance in these regions. This may suggest an increase in creditworthiness of firms in the regions. Since, the onset of the crisis (2007), investment grade issuance has been surging in Emerging Asia and Emerging Americas, with a CAGR of 27% and 28% respectively. In Emerging EMEA the issuance trend has been more flat with a CAGR of just 2% over the same period. In 2013, IG issuance dipped in Emerging Asia, most likely attributable to anticipation over the unwinding of easy monetary policies in advanced economies and the subsequent impact on the interest rates, currency and cross-border flows of many major EMEs. Nevertheless, by end 2014, IG issuance rebounded. The exception is the Emerging EMEA region, where corporate bond issuance has been more volatile since the crisis, dipping in 2008, 2011 and again in 2014.

Between 2000 and 2007, the CAGR of high yield issuance in Emerging Asia was 15%, in Emerging Americas 23% and in Emerging EMEA 37%. However, with the onset of the crisis, growth in high yield issuance stalled. Between 2007 and 2014, CAGR dropped to 6% in Emerging Asia, 0.4% in Emerging Americas and had negative growth of -9% in Emerging EMEA.

Figure 30: High Yield and Investment Grade



Source: Dealogic

There are some shifts in the country issuer mix in the Emerging Asia region; in recent years most of the IG and high yield bond issuance comes from China. While the regional trend in high yield and investment grade issuance appears relatively steady over the last decade for the Asia Pacific region, there has actually been a dramatic shift in issuance activity at the country level. IG issuance from China and South Korea has made-up nearly 77% of all IG issuance since 2000 in the Asia Pacific. In the last few years (2000 and 2012), IG issuance has continued to grow in China, reaching \$591 billion in 2014. However, there has been a shrinking of IG issuance across some of the other larger EMEs in this region including: South Korea and Malaysia.

Similarly between 2003 and 2007, the majority of high yield issuance came from South Korea. However since 2007¹⁰⁸, high yield issuance has surged in China, increasing more than 7 times between 2007 and 2014. Similarly, in India, high yield issuance has more than doubled. Meanwhile, high yield issuance from South Korea has disappeared almost completely, coinciding with a slump in economic growth.¹⁰⁹

In Emerging Americas, IG and high yield issuance has traditionally come predominantly from Brazil and Mexico, however this concentration has been shrinking in recent years with other countries also boasting strong growth. Just before the crisis in 2006, IG issuance from Brazil and Mexico made up 84% of total IG issuance in the region. By 2014, issuance from these countries made up 77%. This reduction in concentration is not due to slacking IG issuance growth in these economies. On the contrary, IG issuance has surged in both Brazil and Mexico, increasing more than 12 times in Brazil and almost quadrupling in Mexico between 2007 and 2014. However, at the same time, other countries in the region have also boasted impressive growth in IG issuance – for example: Chile (increasing 7 times) and Columbia (increasing 8 times) have seen a substantial growth in issuance between 2008 and 2014, with IG issuance from these markets making up 20% of total IG issuance in the region in 2014.

In the high yield issuance space, Brazil, Mexico and Venezuela account for 75% of total issuance in the region, since 2000. Between 2000 and 2007 specifically, high yield issuance came mainly from Brazil and in fact in 2006, 76% of high yield issuance in the region came from Brazil alone. However after the onset of the crisis, high yield issuance from Brazil plummeted from a high of \$15 billion in 2006 to \$6 billion in 2008. Meanwhile, high yield issuance from Mexico has seen solid growth since the crisis, with high yield issuance more than doubling in size since 2007, to reach \$7 billion in 2014 (comparative with Brazil's high yield issuance in 2014 of \$7 billion). In the last few years (2012-2014), high yield issuance has also been upward trending in Venezuela, Chile, Guatemala, Peru and Jamaica.

Developments in Russia drive the recent downward trend in IG and high yield issuance in Emerging EMEA. Other countries in the region remain upward trending. IG issuance has been driven predominantly by issuance from Russia, the United Arab Emirates, Qatar and Saudi Arabia. Between 2000 and 2014, issuance from these markets accounted for around 71% of all IG issuance in the region. The drop in IG issuance volume in 2014 is mainly attributable to developments in Russia, where recent political dynamics may be affecting market activity as IG issuance halved from a high of \$53 billion in 2013 to \$20 billion in 2014. IG issuance in Qatar has also reduced by 77% in the last two years (2012-2014), most probably due to the lure of cheaper borrowing rates offered by banks in the country.¹¹⁰ Some countries in the region such as the UAE, Turkey, Saudi Arabia and Poland remain upward trending.

¹⁰⁸ With the exception of 2008, where there was no HY issuance from China

¹⁰⁹ Country-level analysis based on Dealogic data

¹¹⁰ See Robert Tuttle and Stephen Morris, "World Cup is no Boon to Bond Market as Qatar Sales Slump", Bloomberg, June 3, 2014.

The issuance of high yield bonds has also come mostly from Russia since 2000 (66%). The drop in high yield issuance in the region in 2014 can thus also be attributed to a slump in issuances in Russia, from \$29 billion in 2013 to \$7 billion in 2014, for similar reasons as described above. High yield issuance from other countries in the region is also relatively subdued, with the exception of 2006 which saw a peak in high yield issuance from Kazakhstan (\$9 billion). In recent years, since 2010, there has been some growth in Nigeria although values remain small (\$2 billion in 2014).

- **Refinancing (and similar) purposes vs. other**

The majority of corporate bonds issued in EMEs have been for purposes other than refinancing (or similar). Figure 31 presents trends in issuance volume of bonds issued by EME firms for the purposes of refinancing (or similar) and bonds issued for other (non-refinancing) purposes. In Emerging Americas, growth in issuance for non-refinancing purposes has remained relatively steady throughout the last fifteen years with a momentary dip in 2008, recording a CAGR of 19% before (2000-2007) and 20% after (2007-2014) the crisis. In 2014, its non-refinancing issuances in the region reached \$111 billion.

In Emerging Asia, non-refinancing issuance also experienced some marginal accelerated growth in the post-crisis period, increasing from a CAGR of 18% before the crisis to a CAGR of 22% after the onset. In 2014, non-refinancing issuance reached \$620 billion.

Emerging EMEA has followed a somewhat different trajectory to the other regions. Non-refinancing issuance enjoyed steady growth in the pre-crisis period, with a CAGR of 44% between 2000 and 2007. As the crisis hit, non-refinancing issuance dropped momentarily before a steep peak in 2013 (\$137 billion). In 2014, non-refinancing issuance again dropped off dramatically almost halving to \$74 billion. The CAGR for non-refinancing issuance in EMEA for the period 2007-2014 comes out to -3% due to this sudden drop.

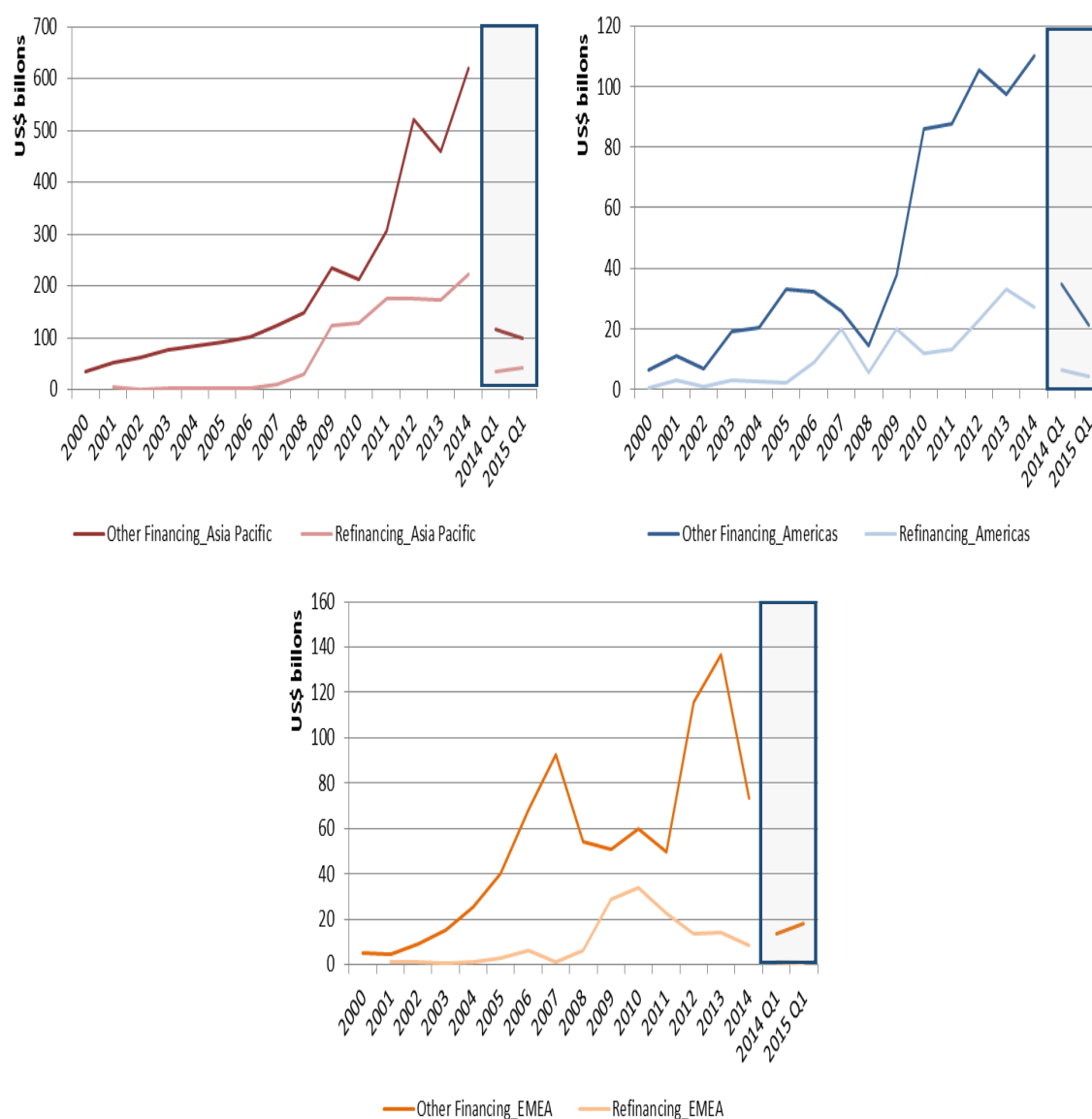
Nevertheless issuance for refinancing or similar purposes has been on a general upward trend across the EME regions since 2000. Between 2000 and 2007 refinancing issuance from Emerging Americas had a CAGR of 69%. After the onset of the crisis, the CAGR of refinancing issuance reduced to 4% and is expected to reach a value of \$27 billion in 2014.

In Emerging Asia, refinancing issuances soared after the onset of the crisis. Before the crisis refinancing issuances experienced a CAGR of 12%, which increased to 47% between 2007 and 2014. In 2014, refinancing issuances reached a decade-long high of \$221 billion.

In Emerging EMEA, before the crisis, refinancing issuance was small, with a CAGR of -1.4% recorded for the period 2000-2007. After the crisis, particularly in 2010, refinancing issuance peaked (reaching \$34 billion). By 2012, refinancing issuance had depressed somewhat. Nevertheless for the period 2007-2014, refinancing issuance had a positive CAGR of 30%, reaching \$9 billion in 2014.

The increase in refinancing issuance may be attributable to business uncertainty following the onset of the crisis, along with low global interest rates which reduced the costs of borrowing/refinancing. The trend may also be reflective of increasing comfort in some EMEs in turning to the bond market for financing purposes.

Figure 31: Issuances for refinancing or similar purposes vs other purposes



Source: Dealogic

In the Emerging Asia region, China and South Korea account for the majority of refinancing issuance, however refinancing issuance has shot-up substantially in India in the last two years. Before the crisis, refinancing issuance in the region was very low. China registered no refinancing issuance, while other economies in the region experienced sporadic issuance. However after the onset of the crisis, refinancing issuance in South Korea, and to a greater extent, China exploded. Between 2007 and 2014, refinancing issuance almost doubled year-to-year (a CAGR of 85%) in China, reaching \$176 billion in 2014. In South Korea, refinancing issuance increased with a CAGR of 50%, reaching \$29 billion. China and South Korea account for 89% of all refinancing issuance in the region. However, between 2012 and 2014, refinancing issuance in India also experienced strong growth, quadrupling in volume and reaching \$10 billion in 2014.

In Emerging Americas, corporate bonds issued for refinancing purposes have come mainly from Brazil and Mexico, although other EMEs in the region have seen some prolonged issuance in the last few years. Between 2000 and 2014, Brazil and Mexico accounted for 71% of all issuance for refinancing purposes. In 2014, refinancing issuance dropped dramatically in Brazil (-36%), reaching \$8 billion in 2014. In the last few years, the markets of Chile, Argentina, Peru, Jamaica and Columbia

have seen some steady issuance as well. In 2014, refinancing issuance reached \$3 billion in Chile, \$1 billion in Columbia, Peru and Jamaica and \$0.3 billion in Argentina. Puerto Rico, Uruguay and the Bahamas also registered refinancing issuance in 2014, but have had relatively sporadic issuance over the period.

Refinancing issuance in the Emerging EMEA region, appeared in any substantial form, only after the onset of the crisis and mainly originating from Russia (albeit dropping off in the last few years), and Israel and the UAE to a lesser extent. In Emerging EMEA, there is a limited discernible trend in refinancing issuance since 2000. In 2008, refinancing issuance soared in Russia, reaching a peak of \$14 billion before dropping to just \$4 billion and 2012 and continuing a downward trend to reach just \$0.5 billion in 2014. This drop is most likely due to sanction measures imposed on Russia and which limit Russian firms' access to international markets in order to refinance their debt. Israel and the UAE have seen some volatile growth in recent years, accounting for 11% and 9% of total refinancing issuance since 2000 and reaching \$4 billion and almost \$1 billion respectively in 2014.

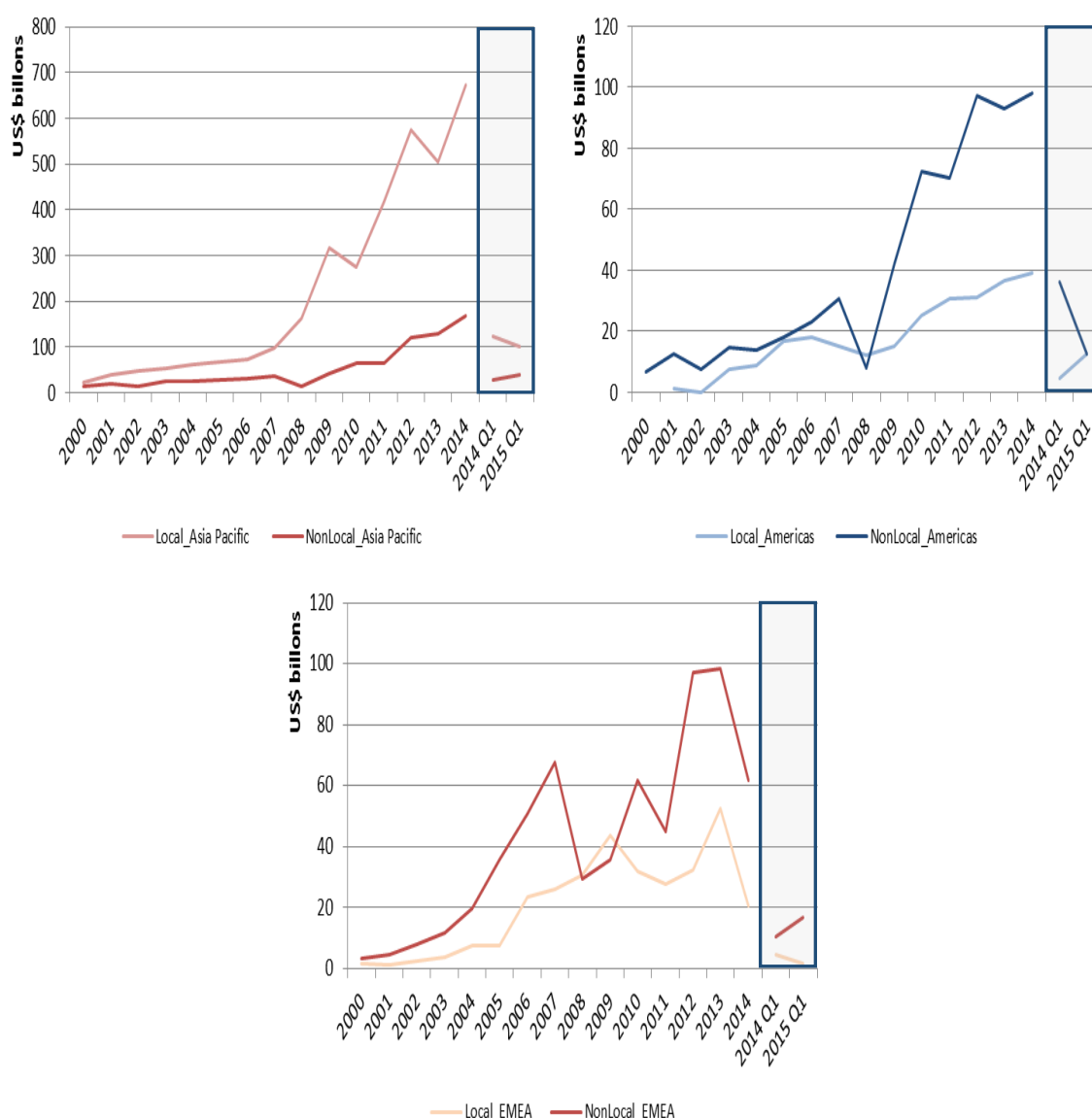
- **Local currency vs. non-local currency**

While the majority of issuance from Emerging EMEA and Emerging Americas are in non-local currencies, the reverse is true for Emerging Asia. Figure 32 separates out trends in issuance of local and non-local currency bonds from EME firms. In Emerging Americas, growth in local currency issuance had a CAGR of 43% between 2000 and 2007, decreasing after the onset of the crisis to 13% CAGR. Issuance of non-local currencies grew at a slower CAGR (21%) in the pre-crisis period. Since the onset of the crisis, non-local currency issuance has been growing faster than local currency issuance with a CAGR of 16% between 2007 and 2014. In 2014, total local currency issuance reached \$39 billion (25% of total issuances) and total non-local currency issuance reached \$98 billion.

Growth in both local and non-local currency issuance in Emerging EMEA was similar before the onset of the crisis (42% and 46% CAGR respectively). In the last few years, local and non-local currency issuance dropped significantly, with a CAGR of -3% and -1% respectively. This negative growth is a product of general declining issuance volumes in Russia in the last year due to political tensions in the region. In 2014, local currency issuance amounted to \$20 billion and non-local currency issuance reached \$61 billion.

Contrasting Emerging Americas and EMEA, local currency issuance in Emerging Asia picked up after the onset of the crisis increasing from a CAGR of 21% between 2000 and 2007 to a CAGR of 27% between 2007 and 2014. Meanwhile, non-local currency issuance has also picked up. Between 2000 and 2007, the CAGR of non-local currency issuance was 14%, increasing to 21% between 2007 and 2014. In 2014, local currency issuance reached a high of \$673 billion, while non-local currency issuance equated to less than one sixth of that at \$129 billion.

Figure 32: Local and Non-Local currency issuances



Source: Dealogic

In Emerging EMEA, since 2010, most of the EMEs have seen the majority of their corporate bond issuance in non-local currency. Only for Slovenia, Slovak Republic, Kenya, Tunisia, Egypt, Saudi Arabia and Russia was the majority of issuance in local currency. While Russia's local currency markets grew substantially between 2001 and 2013, issuance dropped from a high of \$43 billion in 2013 to just \$15 billion in 2014. Meanwhile, local currency issuance has been on a flat decline in South Africa, with no issuances in 2014. Other local currency issuances from EMEs in the region have been sporadic.

In Emerging Asia, the high volume and growth in local currency issuance is driven by China. In the region itself, there is a fairly even split between those EMEs with strong local currency markets and those with stronger non-local currency markets. Emerging Asia EMEs where local currency issuance has dominated since 2010 include those with generally large corporate bond markets: China, Chinese Taipei, Malaysia, South Korea, Thailand, India and the Philippines. The Marshall Islands and Pakistan only have local currency issuance. Nevertheless, some EMEs with growing bond markets still rely mainly on non-local currency issuance e.g. Vietnam, Indonesia, Sri Lanka, Bangladesh, Laos, Macao, and Mongolia.

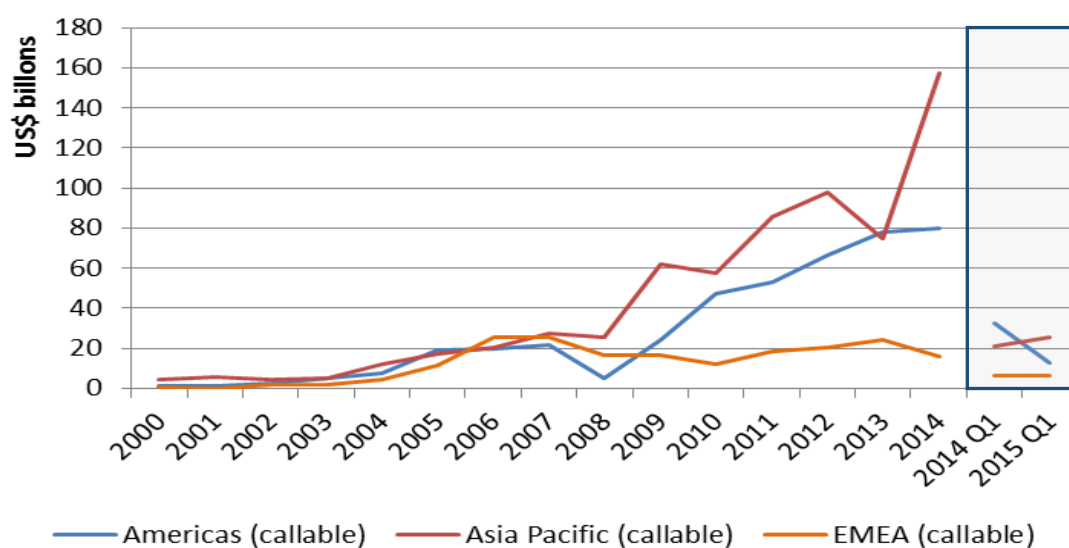
Most local currency issuance in the region originates from China, with total volume in 2014 reaching \$515 billion (equivalent to around 78% of local currency issuance in the region.). Other EMEs in the region have also seen steady growth in their local currency issuance; however South Korea, India, Malaysia and Chinese Taipei have seen a decrease in local currency issuance in the last few years.

The majority of non-local currency issuance in the region also comes from China, reaching \$97 billion in 2014 (equivalent of 55% of Asia Pacific non-local currency issuances). Growth in issuance of non-local currency bonds in China began essentially after 2009. Before that, total non-local currency issuance was less than \$3 billion per year. South Korea, Hong Kong and India, had a more active non-local currency bond market before the crisis and growth has continued through the decade. India's non-local currency bond issuance in particular has grown steadily with negligible issuance recorded before 2003 compared to a high of \$17 billion in 2014 (the 2nd largest non-local currency issuer in the region).

- **Callable bond issuance**

Since 2000 up until the onset of the crisis, issuance volume of callable bonds increased steadily across the EME regions. After the crisis, callable issuance continued growth in Emerging Americas and Emerging Asia, but flattened in Emerging EMEA. Figure 33 tracks data on the issuance of callable bonds in EMEs. Callable bonds refer to those bonds that can be 'called' by the issuer at certain points in time. Effectively, the issuer pays back the principle amount before the bond reaches its pre-determined maturity date. Between 2000 and 2007, callable issuance grew by 45% in the Americas, 26% in the Asia Pacific and 69% in EMEA. Growth in callable issuance dipped in 2008 in Americas, before continuing on an upward trend, reaching \$80 billion in 2014 (with a CAGR of 18% between 2007 and 2014). Likewise in the Asia Pacific, callable issuance flattened somewhat in 2008 before continuing on a strong upward trend, spiking at \$185 billion in 2014 (with a CAGR of 24% between 2007 and 2014). In EMEA, the CAGR between 2007 and 2014 is negative at -6% reaching just \$16 billion in 2014.

Figure 33: Callable issuances



Source: Dealogic

In Emerging EMEA, the majority of callable bond issuance over the last five years have been issued from Russia, Israel, the United Arab Emirates and South Africa (making up 62% of total callable issuances in the region). Saudi Arabia, Poland, the Czech Republic, Qatar and Turkey also had strong issuance volumes, over \$3 billion for the period. In general, issuance has been volatile for most EMEs in the region. In Russia, callable bond issuance was small before 2004, peaking in 2007 at \$15 billion, before dipping to a low of \$0.9 billion in 2010. Although issuance picked up again in 2011, between 2012 and 2014, callable bond issuance from Russia has been strongly downward trending – reaching \$3 billion in 2014. A number of other EMEs follow this up-and-down trend.

Most of the callable issuance in Emerging Americas has come from Brazil and Mexico, accounting for 71% of total callable issuance in EMEs in the last five years. Chile and Columbia have also seen significant growth with total issuance volume over the last five years exceeding \$20 billion. In Peru, issuance has grown steadily since 2005 reaching, \$3.3 billion in 2014. In the last two years, annual issuance of above \$1 billion has been recorded in Argentina and Jamaica.

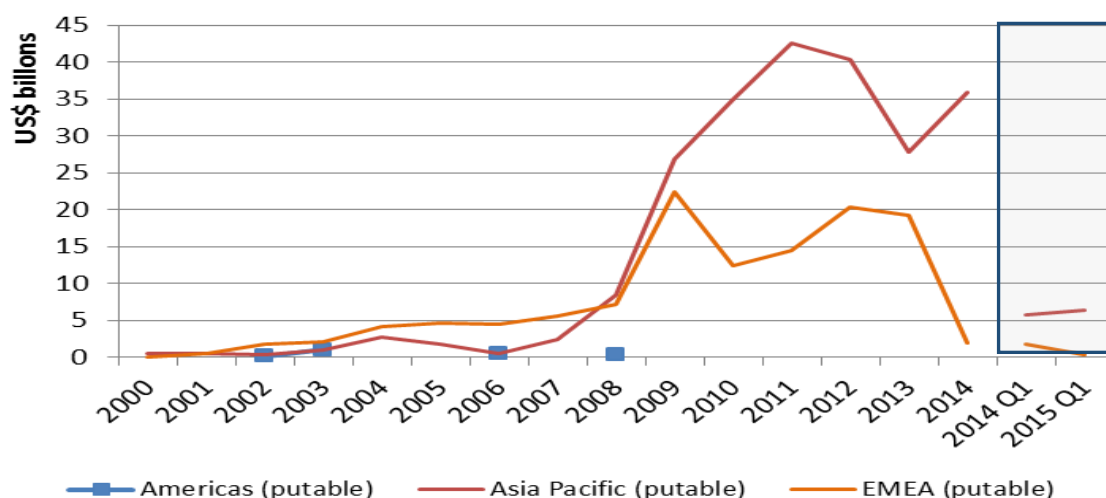
In general, callable issuance has been upward trending across Emerging Asia, with some drop-off in 2014 for South Korea, Indonesia and Hong Kong. Callable issuance from China over the last five years has accounted for 68% of total issuance from the region, reaching \$127 billion in 2014. India has also been a strong issuer, with \$7 billion worth of callable issuance in 2014.

- **Putable bond issuance**

Putable bond issuance increased substantially after 2007 in Emerging Asia and Emerging EMEA. In Emerging Americas, putable issuance has been sporadic since 2000, with no issuance recorded in the last five years. Figure 34 tracks data on the issuance of putable bonds. Putable bonds are those that have predefined ‘put dates’ written into the contract. On these put dates, the holder of the bond can ask the issuer to pay back the original principle loaned – even though the bond has not yet matured. In Emerging Americas, a small volume of putable bond issuance was recorded in 2002, 2003, 2006 and 2008. In Emerging Asia and Emerging EMEA, putable bond issuance grew steadily before the crisis (at 22% and 74% CAGR respectively), picking up after the crisis but slowing down in the last few years. In Emerging Asia the CAGR for putable issuances was 40% between 2007 and

2014, reaching \$36 billion. In Emerging EMEA, putable issuance had a negative CAGR of – 13% for the same period, reaching just \$3 billion in 2014, compared to \$19 billion the previous year.

Figure 34: Putable issuances



Source: Dealogic

In Emerging EMEA, the trend in putable issuance has been driven almost entirely by Russia. Since 2000, 91% of putable bond issuance from Emerging EMEA has come from Russia. In the last few years all putable issuance from Emerging EMEA has come from Russia.

Putable bond issuance has dropped off completely in Emerging Americas. Putable bond issuance has not been recorded since 2008. Before 2008, only Brazil, the Dominican Republic and Mexico issued putable bonds on a sporadic basis.

Despite Emerging Asia recording the highest amount of putable issuances in 2014, most of this trend is driven by China. Nearly all the growth in putable issuance in Emerging Asia is attributable to China, with issuance reaching \$35 billion. In India, putable issuance increased between 2009 and 2013, reaching almost \$3 billion in 2013, before dropping down to \$0.9 billion in 2014.

- **Specialized bond issuances**

Issuance of Sukuk bonds is also picking up in Emerging Asia and Emerging EMEA. Malaysia, Saudi Arabia and the United Arab Emirates are the largest issuers of these types of bonds. Figure 35 presents information on the issuance of Sukuk or Islamic bonds since 2000. Sukuk issuance has increased steadily since the introduction of these bonds in Emerging Asia in 2001 and in Emerging EMEA in 2004. By 2014, issuance reached \$11 billion and \$12 billion in the Asia Pacific and EMEA respectively. Malaysia, Saudi Arabia and the United Arab Emirates are the largest issuers of Sukuk bonds, accounting for around 91% of issuance from EMEs. Other EME issuers of Sukuk bonds include Bahrain, Kuwait, Qatar, Turkey, Hong Kong, India, Indonesia and Pakistan. South Africa issued its first Sukuk bond in 2014.

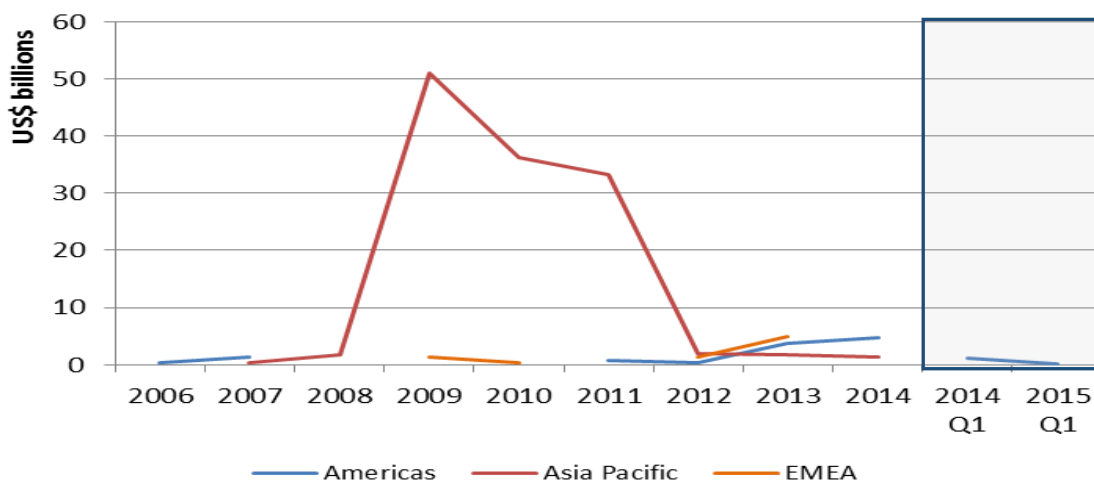
Figure 35: Sukuk bond issuance



Source: Dealogic

Infrastructure issuance saw a boom period between 2008 and 2012, driven mostly by China, but has since dropped off. Nevertheless, there is a small upward trend in some EMEs. Figure 36 presents data on the issuance of bonds for infrastructure financing. Corporate bonds issued to finance infrastructure projects were first recorded in 2006 in some EMEs in the Americas region. Up until 2008, issuance was sporadic. In 2008, infrastructure issuance from China surged, reaching a high of \$49 billion in 2009 before tapering off in 2012. Nevertheless, between 2012 and 2014, more than \$1 billion of bonds for infrastructure projects were issued in Brazil, Saudi Arabia, Slovak republic, Chile, Malaysia, Peru and Columbia each – EMEs with negligible infrastructure issuance in the preceding years.

Figure 36: Infrastructure financing through bond markets



4.4 Secondary Markets

✧ *Comparable and complete data on corporate bond trading activity on secondary markets for EMEs is scarce. This makes an assessment of liquidity conditions in these markets difficult to establish, except in the largest markets. In general, EME corporate bond secondary markets are characterized as small, mostly over-the-counter and limited in terms of activity. The relative illiquidity of EME corporate bond secondary markets compared to developed markets may introduce additional vulnerabilities, especially in times of financial stress.*

One way to understand secondary market trading activity of EME corporate bonds is to look at the trading activity of EME issued corporate bonds on the secondary markets of the US and in Europe. Using data provided by MarketAxess on trading volumes of EME bonds¹¹¹ on US and European secondary markets, this report attempts to present some measure of secondary market activity and liquidity for bonds issued by a range of EMEs. The figures presented in this section provide trading activity, average trade size and turnover ratios for EME issued bonds on a regional and country basis. However, an important caveat is that the trading volume derived measures do not include trading volume on domestic secondary markets – or on non-US or EU secondary markets more generally. For some EMEs, domestic secondary markets are non-existent or negligible making any discrepancies marginal. For other EMEs, especially those with larger corporate bond markets, activity on domestic secondary markets may be significant. As such, the measures of trading activity, average trade size and turnover ratios presented here are not complete measures and should be interpreted only in the context of US and European secondary markets activity only.

In general, trading activity of EME bonds has been relatively flat on European secondary markets, although increasing across all regions on US secondary markets. Figure 37 tracks trading volumes of EM corporate bonds on European and Secondary markets, by quarter. On European secondary markets, trading is highest for Emerging Asia and Emerging Europe bonds, with both types reaching seeing \$2.3 billion worth of trading activity in the first quarter of this year. Emerging Americas bonds saw slightly smaller trading activity, reaching \$2.1 billion in the same period. Emerging Africa bond activity has been relatively low and flat since 2012 but jumped up in the first quarter of 2015 to equal around \$1.3 billion. Finally, Emerging Middle East bond trading activity has been steady on European secondary markets, dipping at the end of 2013 before recovering at \$1.6 billion in Q1 2015

On US Secondary markets, trading of Emerging Americas bonds dominate and are strongly upward trending, reaching around \$14.6 billion of trading activity in 2015 Q1. Trading of Emerging Asia bonds also showed strong upward growth on US secondary markets reaching almost \$3.8 billion while trading of Emerging Europe bonds are smaller on US secondary markets reaching \$1 billion. Emerging Africa bonds saw a jump in trading activity on US secondary markets in 2013 Q3, with growth flattening somewhat following this period to reach \$1.4 billion in the beginning of 2015. Trading of Emerging Middle East bonds has been minimal but upward trending, reaching just \$0.3 billion in Q1 2015.

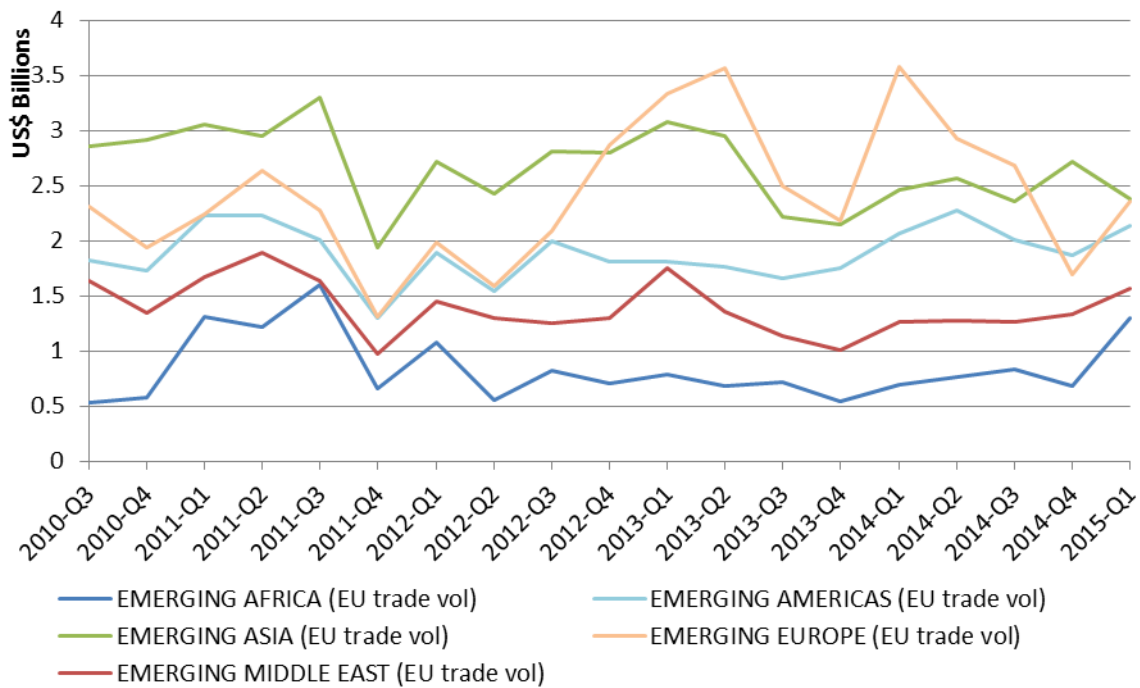
Interestingly, despite the ‘taper tantrum’ in 2013 Q3, there was little prolonged impact on the amount of trading activity in most of the selected regions. In Emerging Europe (on European secondary markets) and Emerging Americas (on US secondary markets), trading volume dipped

¹¹¹ By nationality of issuer

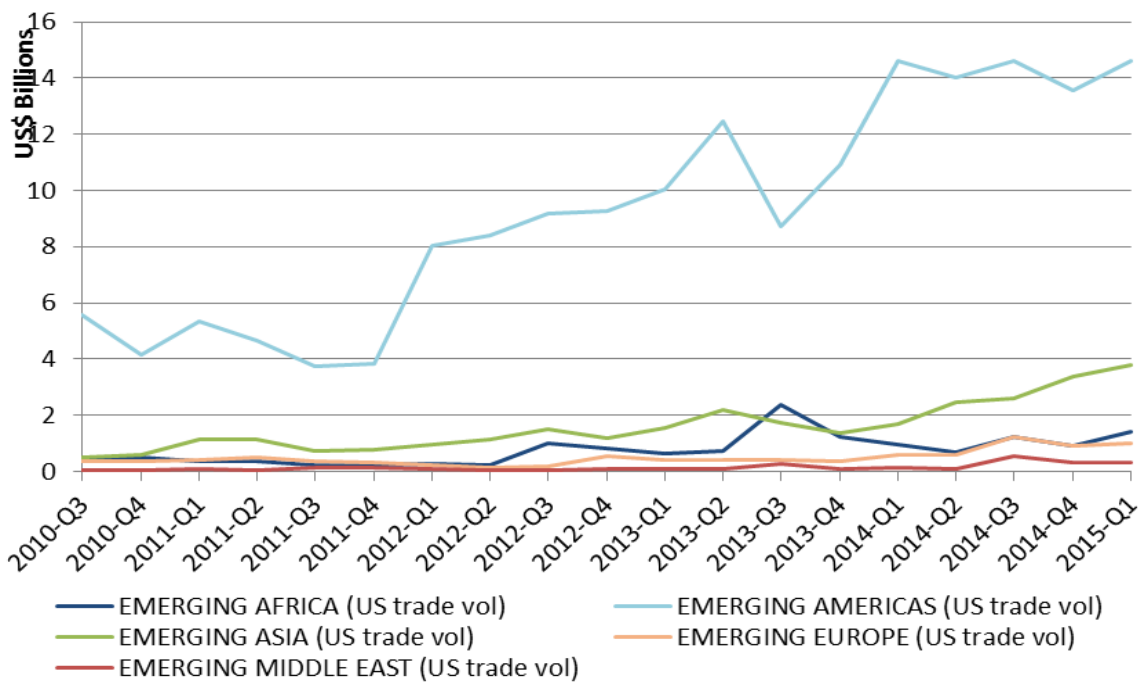
momentarily but quickly recovered. However for Emerging Europe, trading volume on European secondary markets has been on a downward trend since the beginning of 2014.

Figure 37: Total Trade Volume - US and Europe Secondary Markets for EME bonds – by region

Trading volume on European Secondary Markets



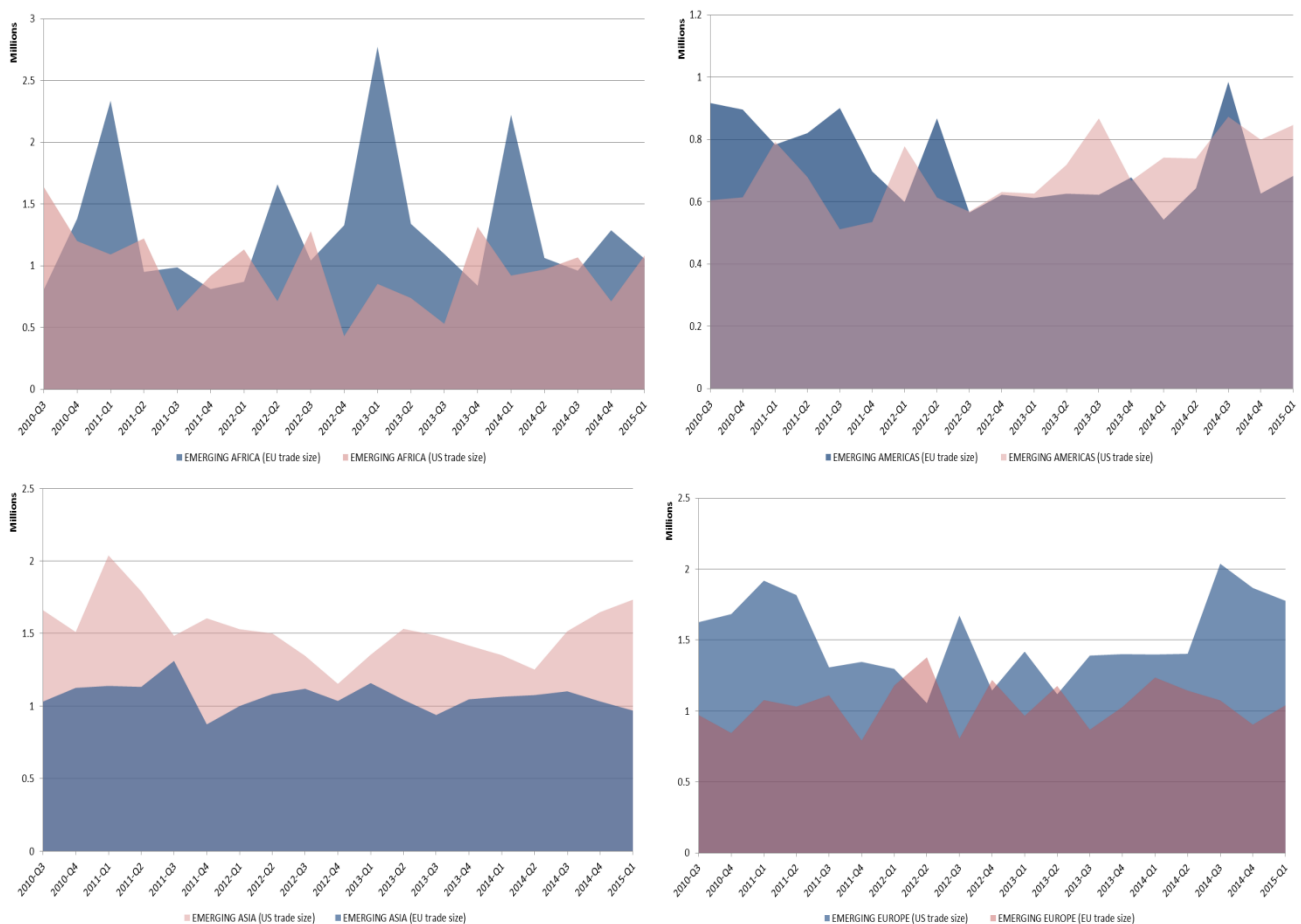
Trading volume on US Secondary Markets

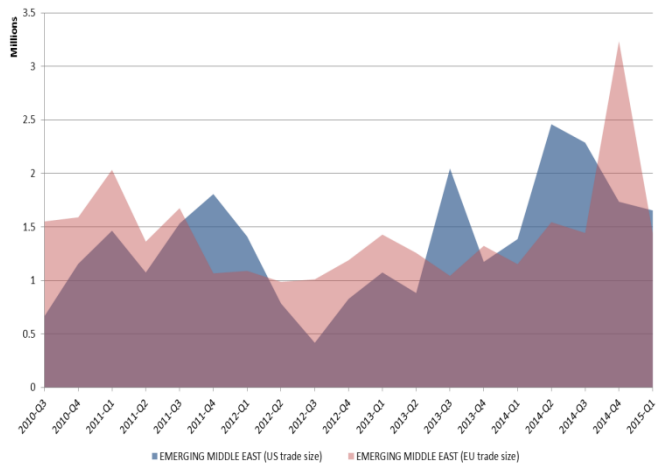


Source: US secondary market data from TRACE and MarketAxess, European secondary market data from Trax, a subsidiary of MarketAxess

Average trade size differs across the EME regions but has not changed significantly since the end of 2010, with the exception of EME bonds from the Middle East. In Emerging Africa, average trade size by quarter on both US and European secondary markets sat at the \$1 million mark. In Emerging Americas, average trade size was just below \$1 million (\$0.85 million) on US secondary markets in Q1 of this year but only \$0.68 million on European secondary markets in the same period. In Emerging Asia and Emerging Europe average trade size is generally quite large. On US secondary markets average trade size in the first quarter of this year was \$1.7 million and just under \$1 million on European markets. In Emerging Europe, average trade size was \$1.7 million on European secondary markets and just over \$1 million on US secondary markets. In the Middle East, average trade size has grown from \$0.7 million at the beginning of 2010 in European secondary markets to \$1.5 million at the beginning of 2015. On US secondary markets, trade size grew from \$0.5 million to \$1.7 million during the same period.

Figure 38: Average Trade Size - US and Europe Secondary Markets for EME bonds – by region



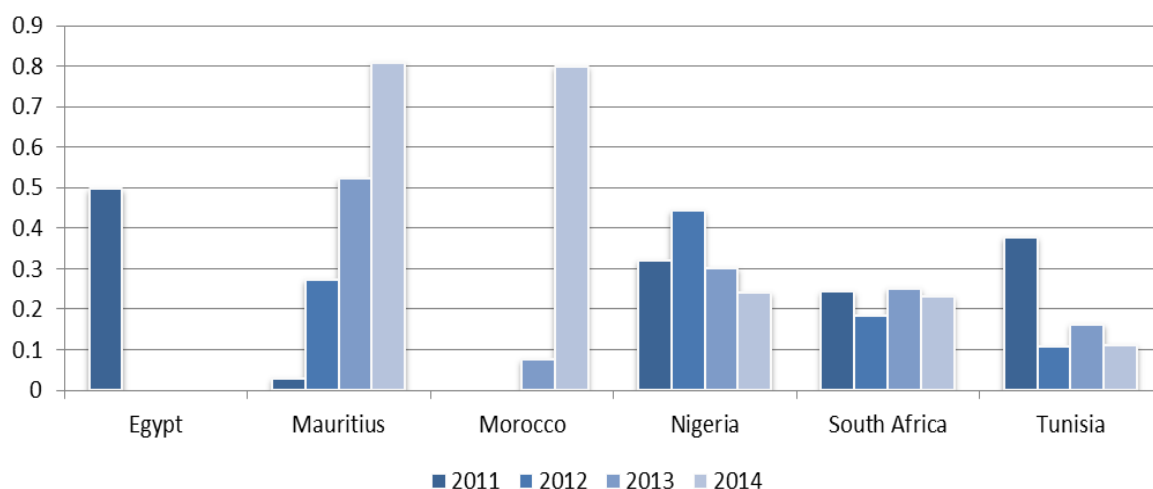


Source: US secondary market data from TRACE and MarketAxess, European secondary market data from Trax, a subsidiary of MarketAxess

In general, turnover ratios for African bonds are tight (less than 0.25) with the exception of Mauritius and Morocco. Figure 39 shows the variability in the bond turnover ratio¹¹² across African EMEs. In 2014, the ratio reached around 0.8 in Mauritius and Morocco, just under 0.25 in Nigeria and South Africa and just 0.1 in Tunisia. In Egypt the ratio was equal to zero in 2014. The ratio has increased significantly over the past few years in Mauritius but appears to be on a decreasing trend in Nigeria and Tunisia. In South Africa, the ratio has remained fairly constant. All these markets, with the exception of South Africa, have relatively small corporate bond markets.

¹¹² Bond turnover ratio is measured here as trading activity on US and European secondary markets over total outstanding.

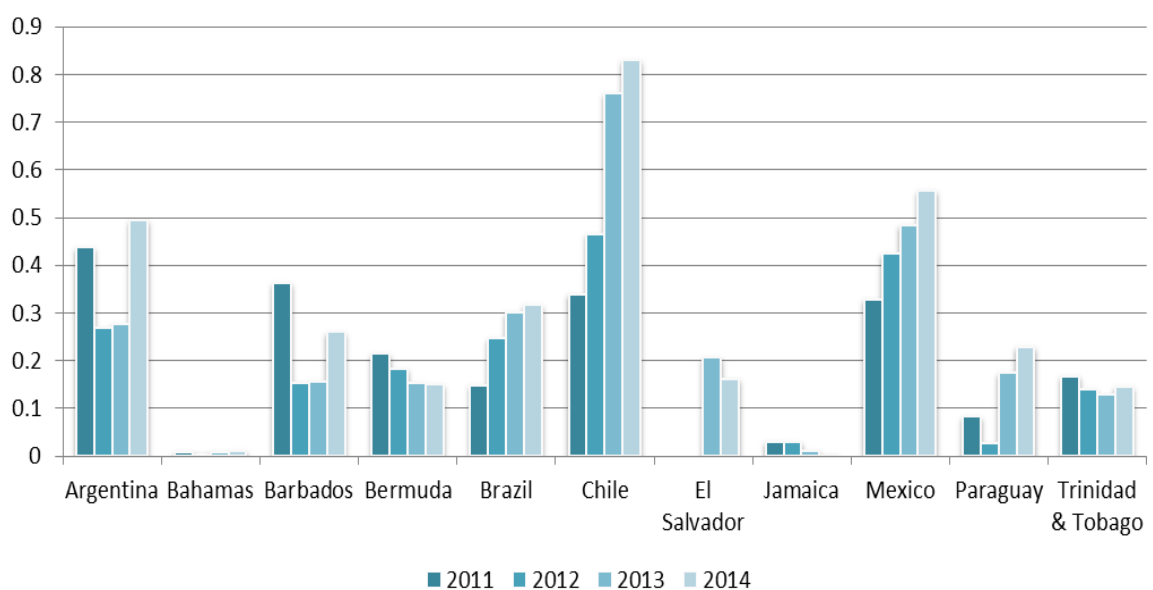
Figure 39: Ratio of trading volume on EU and US secondary markets to total outstanding – Emerging Africa



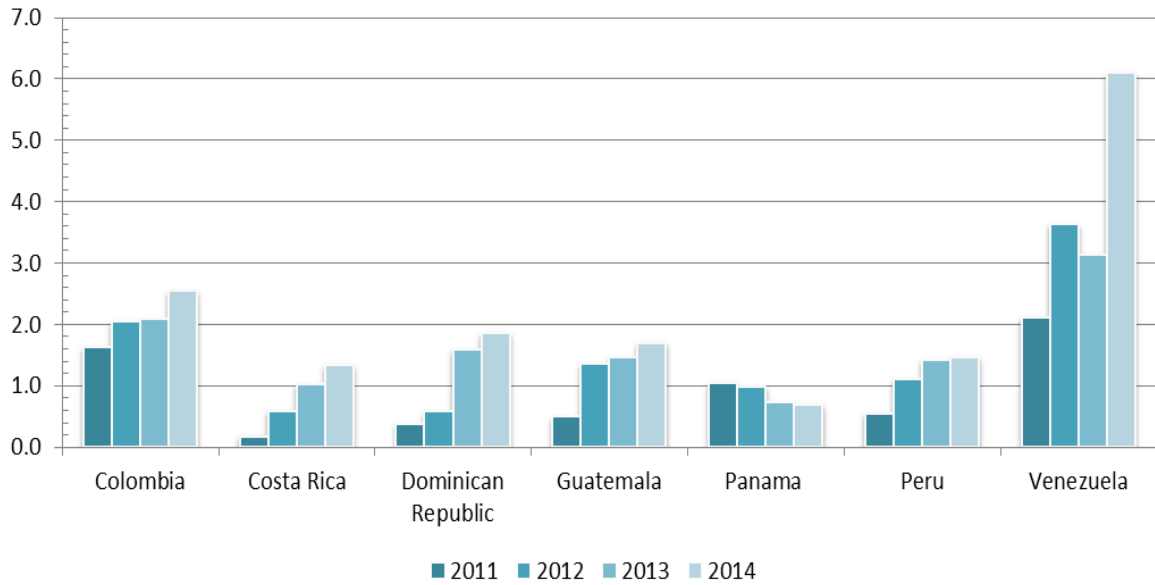
Source: US secondary market data from TRACE and MarketAxess, European secondary market data from Trax, a subsidiary of MarketAxess

Over the last four years, a number of EMEs in the Americas have boasted an increasing bond turnover ratio. Most of the EMEs in the sample have ratios greater than 0.25, and almost half have ratios greater than 1. Figure 40 shows that Brazil and Mexico, which have established domestic corporate bond markets, have experienced increasing ratios over the last few years. In fact, between 2011 and 2014, annual trading activity doubled in Brazil and Mexico, reaching almost \$300 and \$180 billion respectively for 2014.¹¹³ In Brazil, the turnover reached just over 0.3 in 2014. In Mexico the ratio reached around 0.55. Columbia, Costa Rica, the Dominican Republic, Guatemala, Peru and Venezuela all had bond turnover ratios greater than 1 in 2014 and have experienced steep growth in trading activity since 2011. Nevertheless, with the exception of Peru and Venezuela, all of these EMEs have corporate bond markets smaller than \$5 billion in total outstanding.

Figure 40: Ratio of trading volume on EU and US secondary markets to total outstanding – Emerging Americas



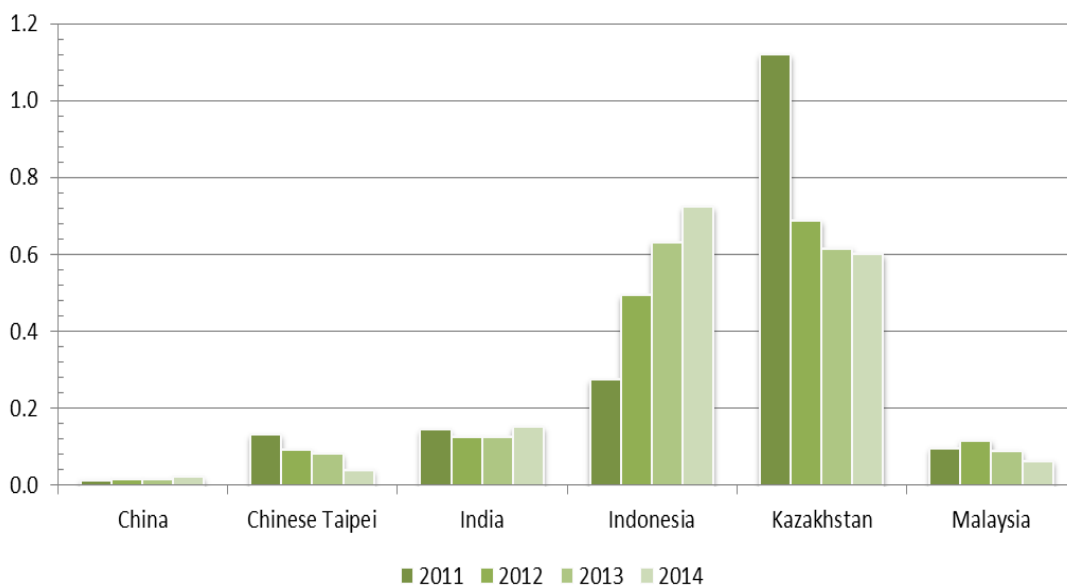
¹¹³ US secondary market data from TRACE and MarketAxess, European secondary market data from Trax, a subsidiary of MarketAxess

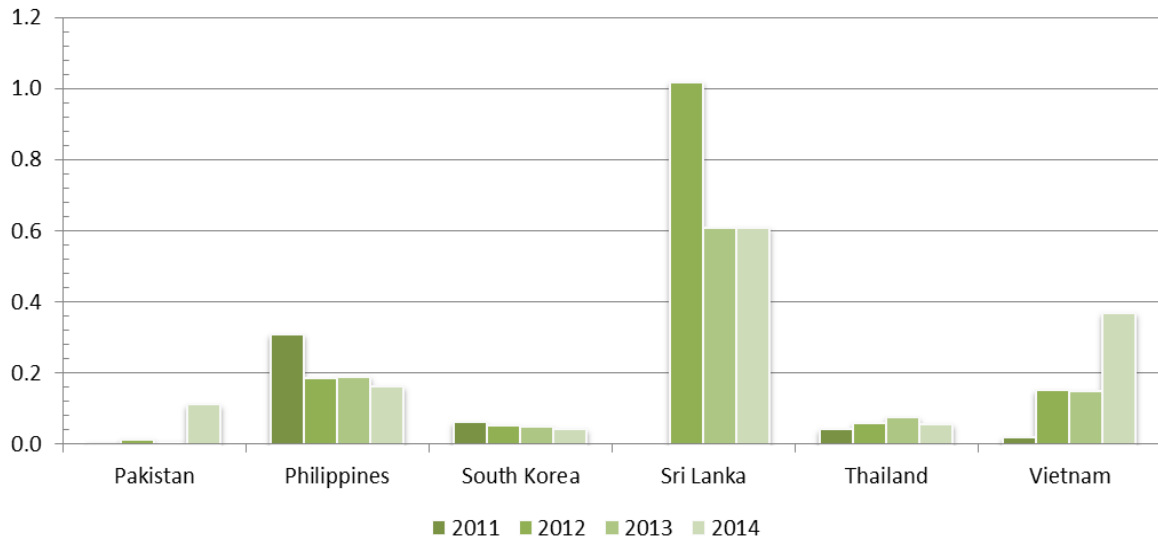


Source: US secondary market data from TRACE and MarketAxess, European secondary market data from Trax, a subsidiary of MarketAxess

Quite a few EMEs in Emerging Asia have bond turnover ratios less than 0.25. With the exception of India, Indonesia, Pakistan and Vietnam, all have seen a decrease in their ratios over the last few years. Figure 41 shows that in India, the ratio has stayed relatively constant but has declined in China, Chinese Taipei, Kazakhstan, Malaysia, Philippines, South Korea and Sri Lanka. The ratio reached above 50% in 2014 in Indonesia, Kazakhstan and Sri Lanka. However, China, South Korea, Thailand and Malaysia all have established corporate bond markets but their bond turnover ratios appear to be less than 7%.

Figure 41: Ratio of trading volume on EU and US secondary markets to total outstanding – Emerging Asia

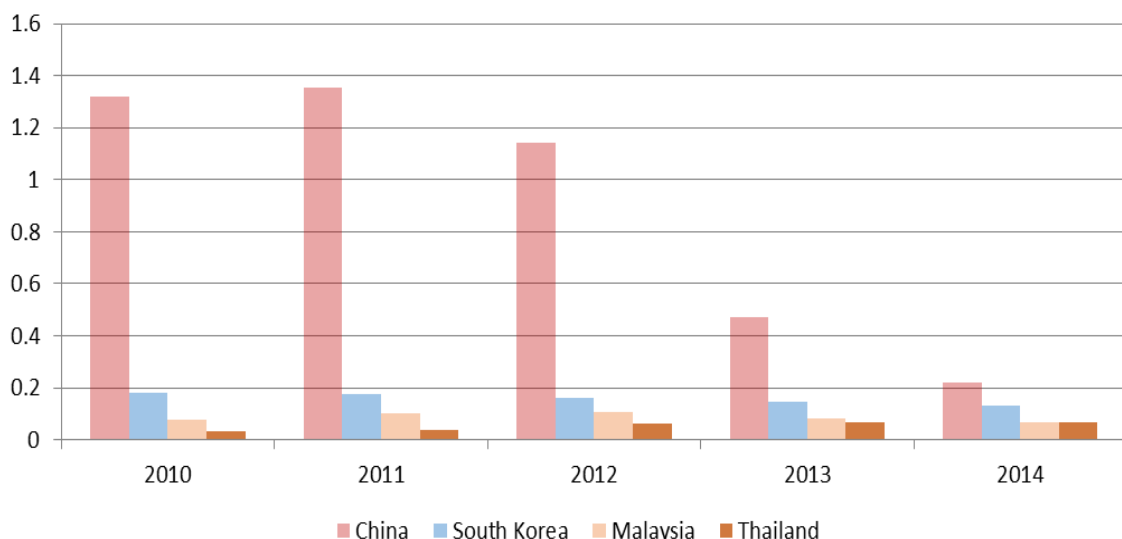




Source: US secondary market data from TRACE and MarketAxess, European secondary market data from Trax, a subsidiary of MarketAxess

Another dataset provides information on total secondary market trading of Emerging Asia corporate bonds. This dataset suggests that the ratios may in fact be higher for some Emerging Asia EMEs, although the trend is the same. Comparing the previous data with figures from the Asian Development Bank, suggests some difference (see Figure 42). For example, the bond turnover ratio in China has been trending strongly downwards but sat at around 22% in 2014. In South Korea, the bond turnover ratio has also been trending downwards slightly, sitting at 17% in 2014. The figures for Malaysia and Thailand are comparable across the two datasets. The discrepancy between the two datasets for the turnover ratios for China and South Korea may be attributable to the existence of functioning domestic secondary markets in these two EMEs. Nevertheless, the declining trend is noteworthy.

Figure 42: Corporate Bond turnover ratio – Emerging Asia (ABO data)

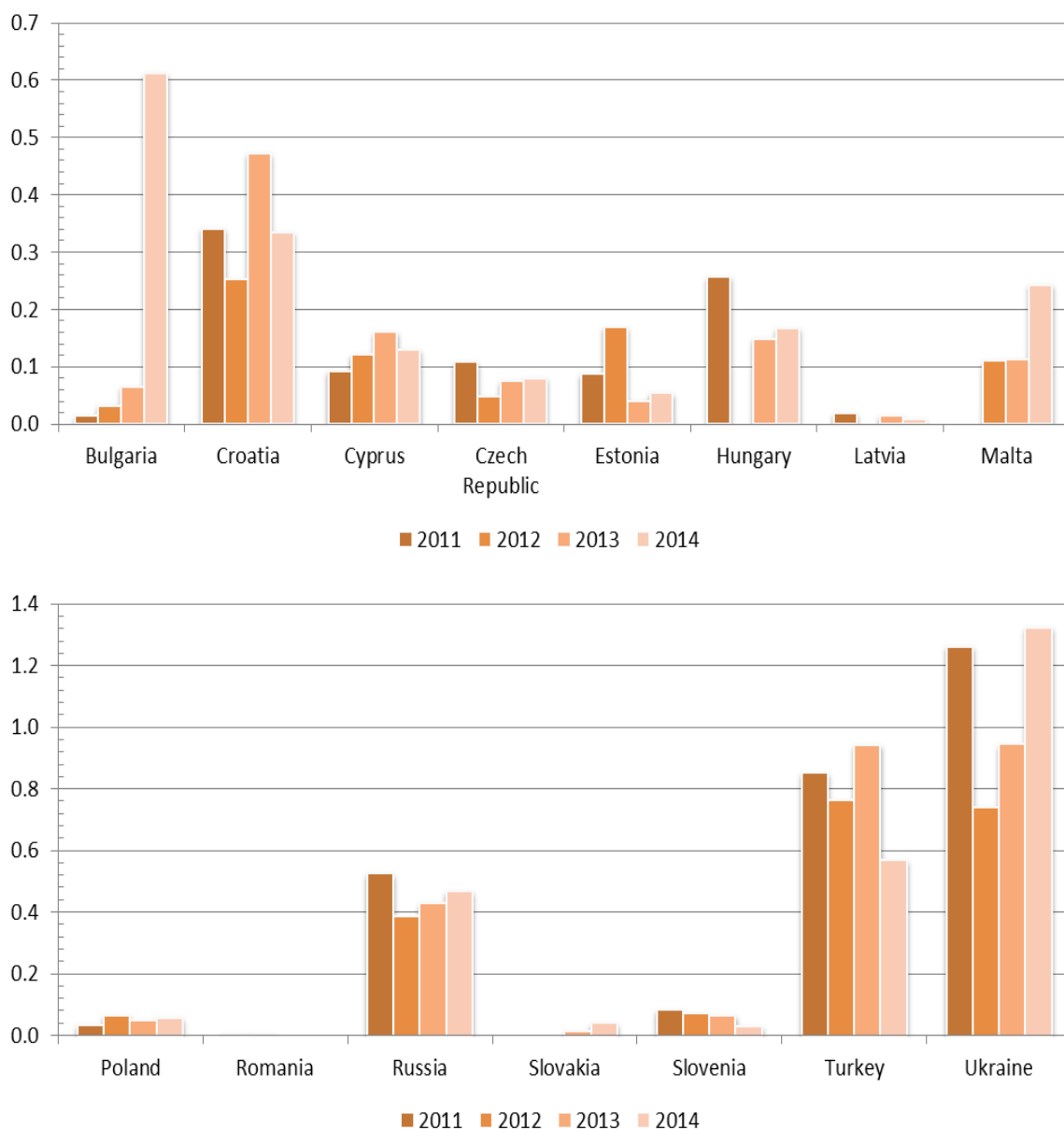


Source: Asian Bonds Online/Asian Development Bank

Only around six EMEs in Emerging Europe had ratios more or less greater than 0.25 in 2014. The trend in the ratios has been relatively volatile over the last few years. The ratio was above 50% in Bulgaria, Turkey and the Ukraine in 2014 (see Figure 44). In the case of Turkey, the bond turnover ratio dropped somewhat in 2014 however the overall trend since 2011 has been steady. In the Czech

Republic, Estonia, Latvia, Poland, Romania, Slovakia and Slovenia, the ratio was less than 10% in 2014. In terms of trends, compared to 2011, the ratio has increased in Cyprus, Bulgaria, Malta, Poland and the Ukraine. The ratio has decreased in Czech Republic, Estonia, Hungary, Latvia, Russia, Slovenia, Croatia and Turkey.

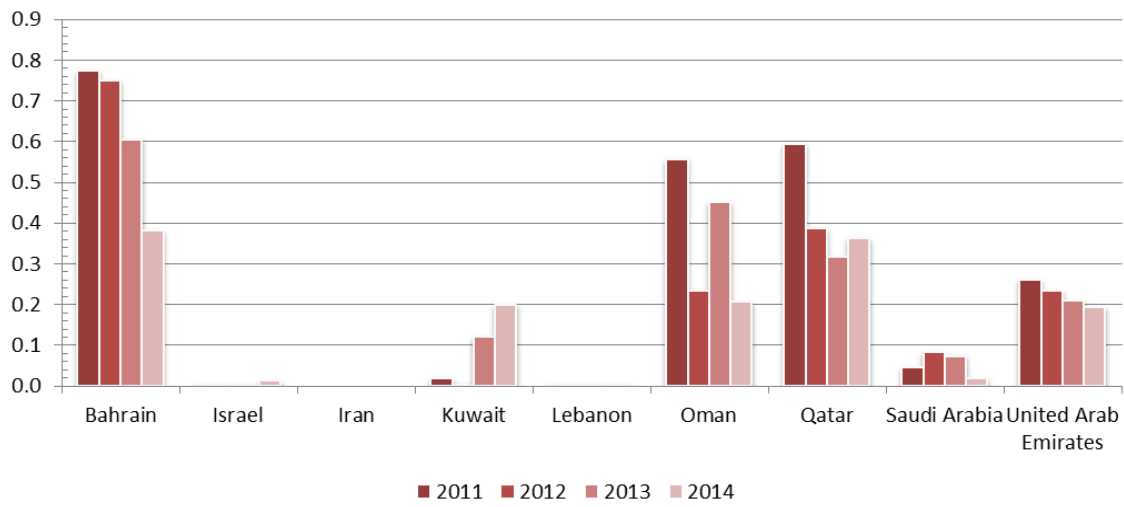
Figure 43: Ratio of trading volume on EU and US secondary markets to total outstanding – Emerging Europe



Source: US secondary market data from TRACE and MarketAxess, European secondary market data from Trax, a subsidiary of MarketAxess

In the Middle East, bond turnover ratios are generally on the decline, with the exception of Kuwait. Oman, Bahrain and Qatar had turnover ratios greater than 50% in 2011 but dropped to 38%, 20% and 36% respectively in 2014 (see Figure 44). Bonds from Israel, Iran, Saudi Arabia and Lebanon have very small turnover ratios on US and European secondary markets (less than 2%).

Figure 44: Ratio of trading volume on EU and US secondary markets to total outstanding – Emerging Middle East



Source: US secondary market data from TRACE and MarketAxess, European secondary market data from Trax, a subsidiary of MarketAxess

Chapter 5: Risks and vulnerabilities

While the EME corporate bond universe is relatively small compared to other sectors of the economy (Equity, Bank etc.), there is little question that EME fixed income is generally a fast growing asset class. Growing corporate bond markets may represent a transition towards financial deepening in EMEs, with plenty of associated benefits. At the same time, the rate of growth, especially in the context of macro-economic and political developments at the global scale may expose vulnerabilities.

This chapter explores some of the potential vulnerabilities that may be present in EME corporate bond markets through investigating currency mismatch and credit risk; rollover risk; and liquidity risk. Finally, the chapter provides a preliminary analysis of potential systemic risk implications, taking into account the need for country differentiation when assessing how risk factors interact in EMEs.

5.1 Currency mismatch and credit risk

✧ *Currency mismatch can occur when liabilities are denominated in a foreign currency while revenue/income is denominated in the local currency. If the local currency depreciates against the foreign currency, the liabilities faced expand in value relative to revenue, which could cause issues in terms of servicing and refinancing the debt. This has implications for credit risk.*

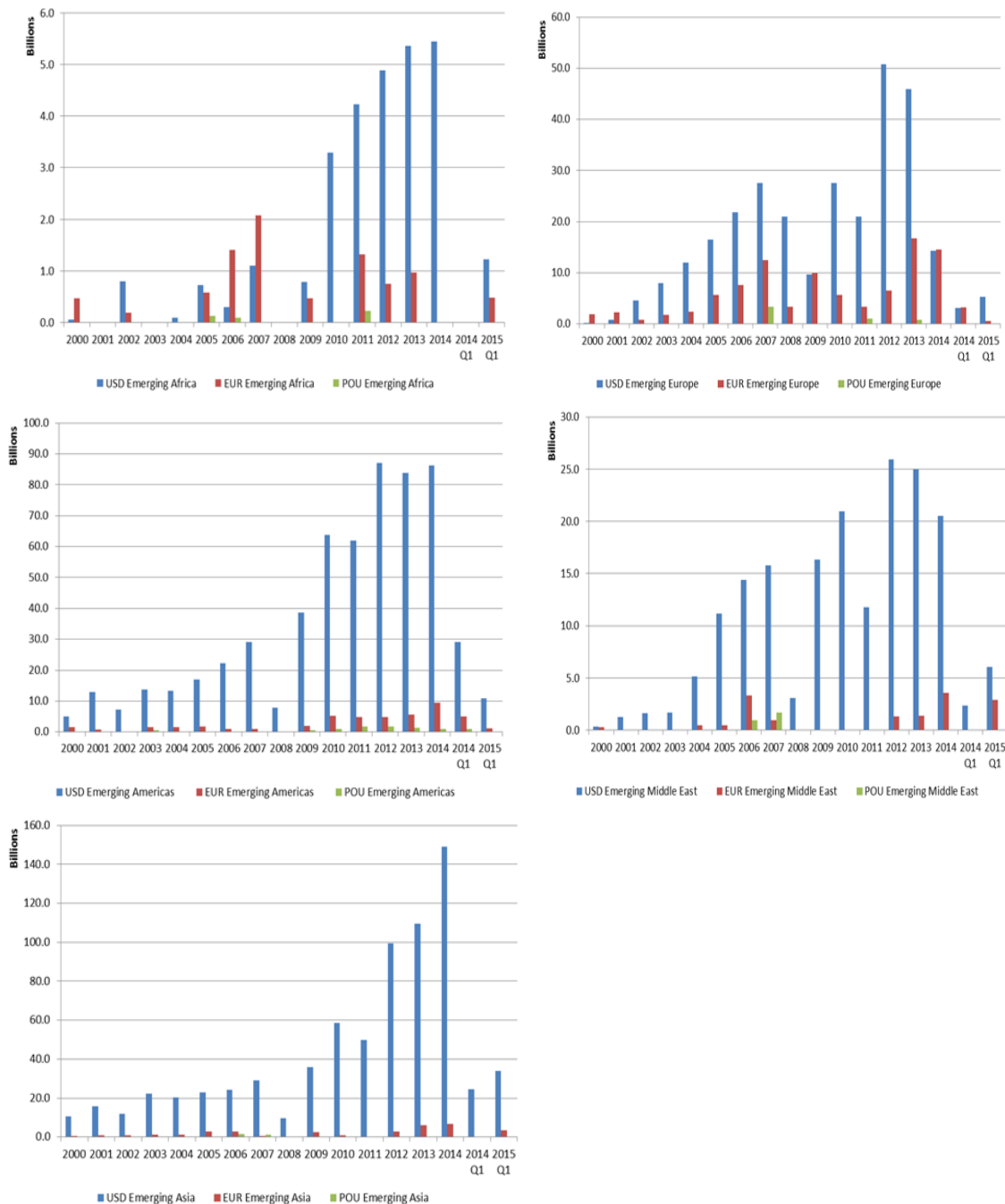
Credit risk relates to the likelihood of default of the issuing firm. Credit risk can be influenced by both internal factors (e.g. inefficient management) and external factors (e.g. the macro-economic conditions the firm operates in). Traditionally, the credit risk associated with EME corporates has been linked with the overall economic, financial and political conditions of the country, and even region, within which it operates - rather than firm specific characteristics. Concepts such as the 'sovereign ceiling' suggest that a firm's credit rating cannot be higher than a country's sovereign rating – since country risk is a dominant component of the yield.¹¹⁴

US dollar (USD-denominated) corporate bond issuance has been increasing steeply across the EME regions. Figure 45 presents a regional breakdown of this issuance. In 2014, most of the USD-denominated bonds came from Emerging Asia, reaching \$150 billion. In Emerging Americas, issuance reached \$85 billion. Issuance was much smaller across the other regions, reaching just over \$20 billion in Emerging Middle East, \$15 billion in Emerging Europe and \$5.5 billion in Emerging Africa.

Euro denominated bond issuance has enjoyed less growth. In Emerging Africa, no euro denominated bonds were issued in 2014, around \$15 billion was issued in Emerging Europe, \$10 billion was issued in Emerging Americas, less than \$5 billion in Emerging Middle East and less than \$10 billion in Emerging Asia.

¹¹⁴ E. Durbin and D. Ng, "The Sovereign Ceiling and Emerging Market Corporate Bond Spreads," Journal of International Money and Finance, Vol. 24, 2005

Figure 45: USD, EURO and POUND denominated debt issuance



Source: Dealogic

However, in terms of absolute value this issuance remains relatively small, compared to the total EME debt universe. In 2014, USD-denominated corporate bond issuance from EMEs totaled around \$276 billion. This represents around a quarter of the total EME issuance that year. Euro-denominated corporate bond issuance from EMEs reached just \$40 billion in the same period. Pound-denominated bond issuance was negligible.

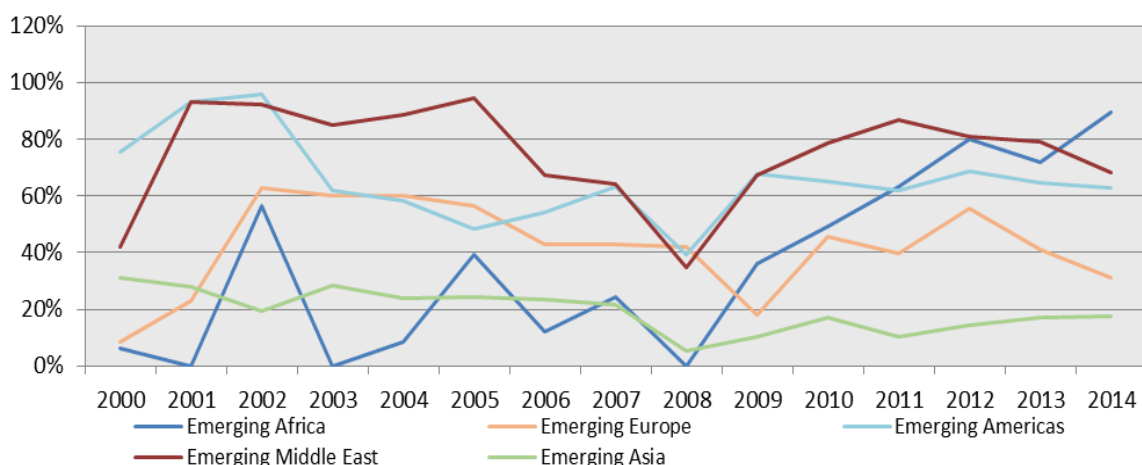
Furthermore, as a proportion of total issuance, growth in USD-denominated debt issuance has been largely flat. Figure 46 presents issuance volume of Euro-, USD- and Pound-denominated debt as a proportion of total issuances from EMEs, by region. While the upward trend in the proportion of USD-denominated issuance has continued in Emerging Africa over the last few years, growth has been flat in the other regions, even declining in Emerging Asia. Nevertheless the proportion is still

high at more than 50% of total issuance in Emerging Middle East, Emerging Americas and Emerging Africa.

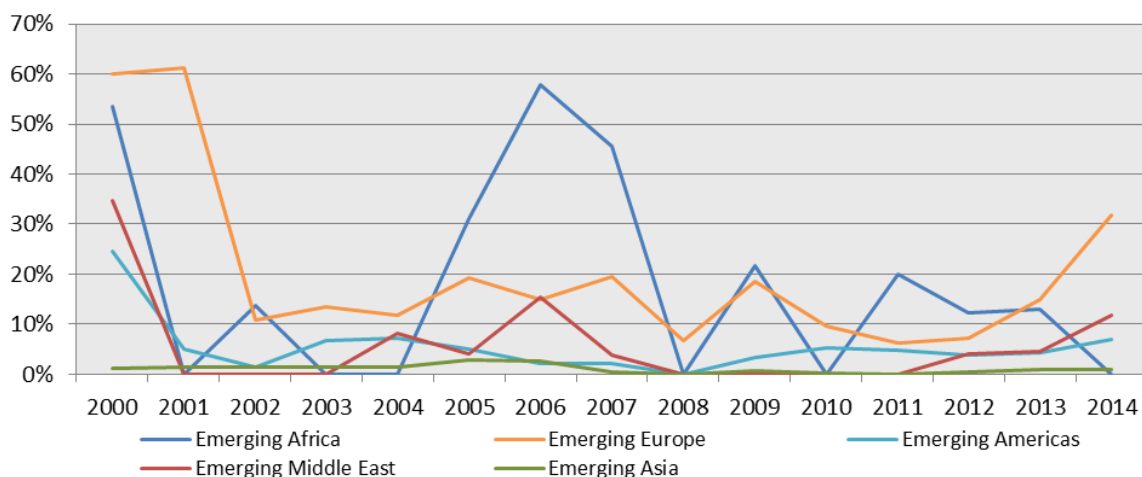
For Euro-denominated bond issuance as a proportion of total issuance, the ratio has been more volatile. In general, the ratio dropped after 2000, with a spike occurring in Emerging Africa in 2006. Since 2012, the proportion has increased in Emerging Europe, Emerging Middle East and Emerging Americas. With the exception of Emerging Europe, the proportion across all regions is low at less than 15% of total issuance.

Figure 46: US, EURO and POUND denominated debt issuance as a proportion of total issuance

EME USD-denominated



EME EURO denominated

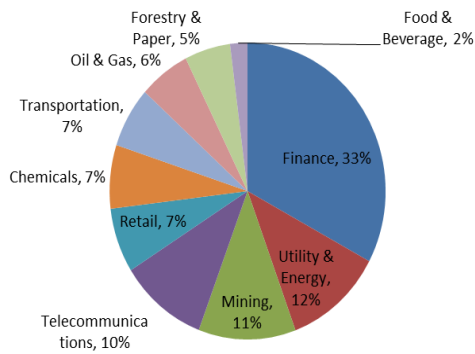


Source: Dealogic

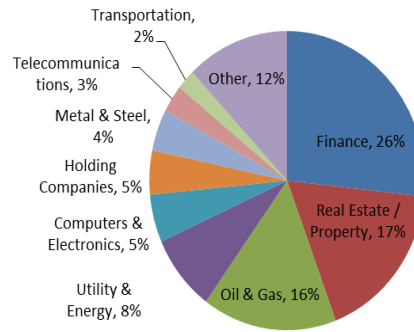
Most of the USD- and Euro-denominated bonds across the EME regions have come from the finance sector. Figure 47 provides a breakdown of USD- and Euro-denominated debt by issuer type in each region, for total issuance between 2010 and 2014. The Finance sector makes up one of the largest, if not the largest issuer group of USD- or Euro-denominated debt in each region. In Emerging Africa and the Middle East, Utilities and Energy make up the second largest group. In Emerging Americas and Emerging Europe, Oil & Gas makes up the largest and second largest group respectively. Lastly, in Emerging Asia, real estate and property makes up the second largest group.

Figure 47: Largest issuer types of US and Euro denominated corporate bonds (issuances between 2010-2014)

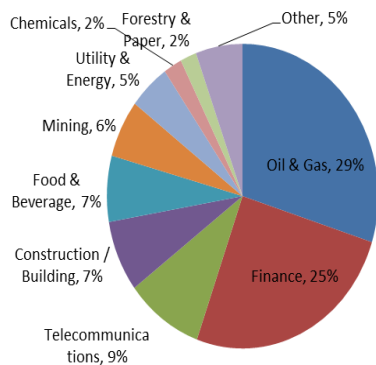
Emerging Africa



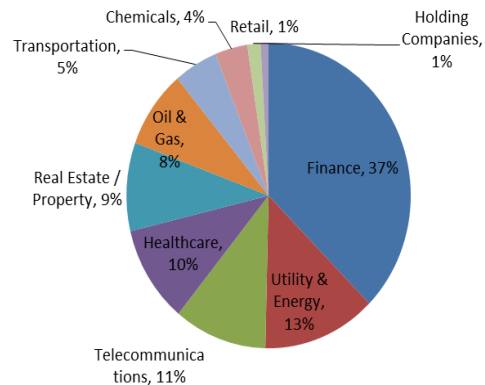
Emerging Asia



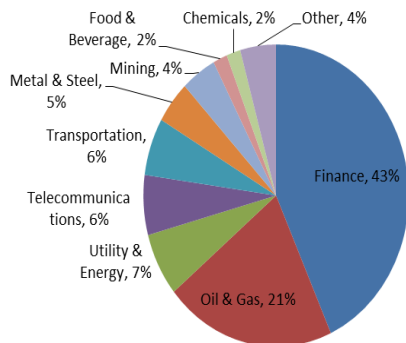
Emerging Americas



Emerging Middle East



Emerging Europe



Source: Dealogic

Apart from the finance sector, other large issuer groups of USD- and Euro- denominated debt tend to be export-oriented industries, which have a natural hedge against currency risk. Export-oriented industries have a natural hedge against currency risk, although the value of the natural hedge ratio varies depending on the industry and indeed the firm itself. This is because such industries tend to receive their revenues in hard currencies thereby reducing the difference between revenues and costs, if their local currency was to depreciate against the US dollar or Euro. Utilities, another big issuer group of USD and Euro-denominated debt are also somewhat shielded from currency risk since they can pass on increased costs to the consumer via their tariff structure.¹¹⁵ Nevertheless,

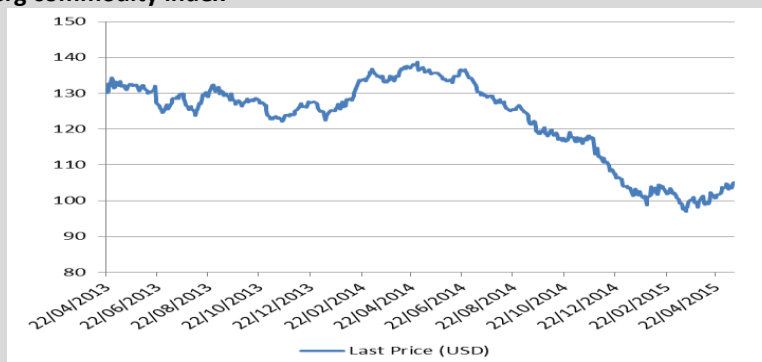
¹¹⁵ See Shamaila Khan, "EM debt Risk – the devil is in the detail", Financial Times, 2014

there are justifiable concerns around the impact of an appreciating dollar combined with the declining value of commodities and what this might mean for credit risk (see Box 3).

Box 3: Corporate debt and Commodity prices

Commodity prices fell drastically halfway through 2014 (see Figure 48). Between mid and end-2014, the price of crude oil fell around 44%.

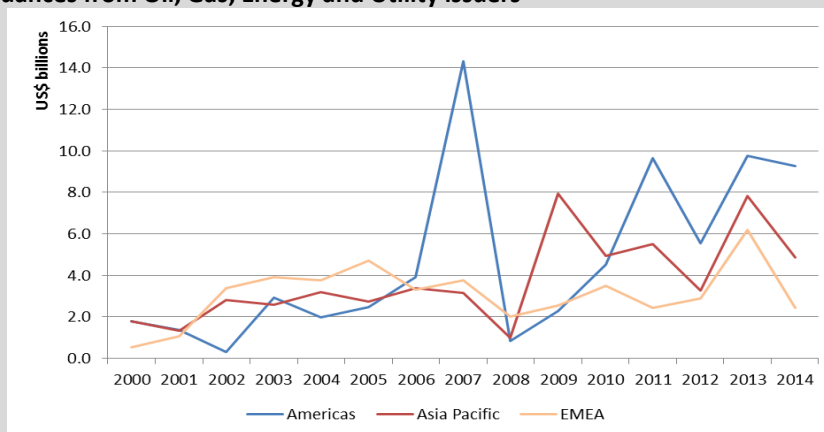
Figure 48: Bloomberg commodity index



Source: Bloomberg

Some commentators have pointed to the interaction between the declining price of commodities such as oil and rising debt levels of commodity producers.¹¹⁶ One concern is that lowering commodity prices will increase the risk of default of commodity-oriented firms. Looking at the data reveals that high yield issuance from Oil, Gas, Energy and Utilities issuers in emerging markets has been relatively low since 2000, albeit on an increasing trend since 2008 (see Figure 49). In 2014, issuance dropped across the emerging market regions equaling just \$9 billion in the Americas, \$5 billion in Asia Pacific and just over \$2 billion in EMEA.

Figure 49: HY issuances from Oil, Gas, Energy and Utility issuers

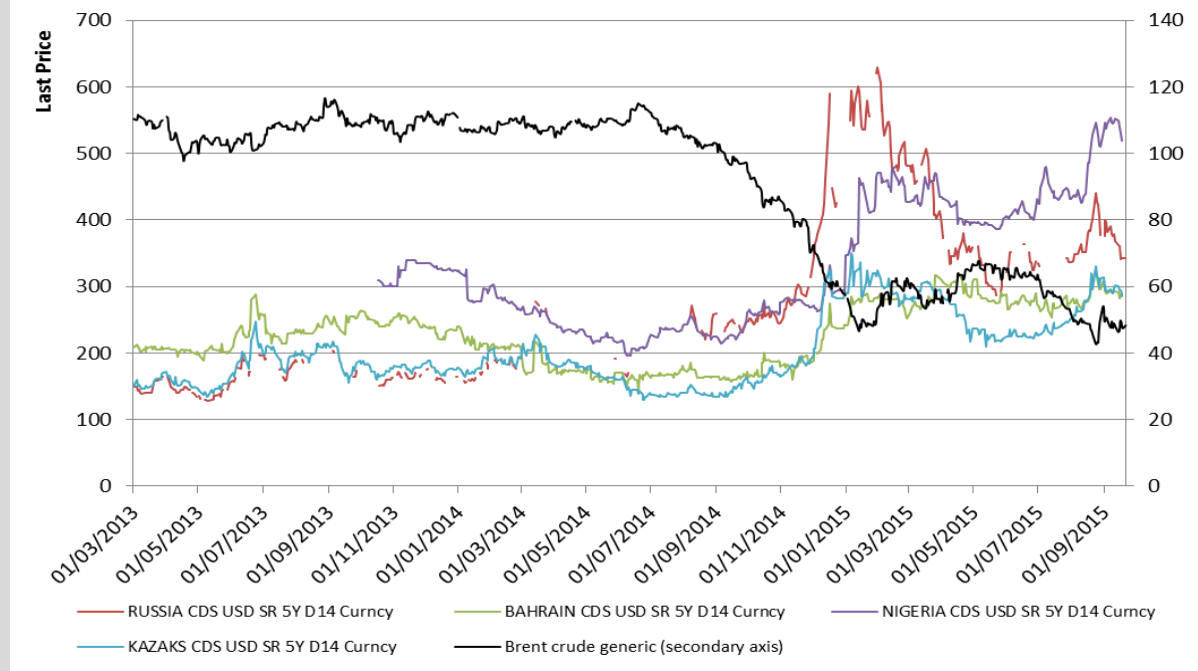


Source: Dealogic

Nevertheless, the default risk component of the yield on newly issued bonds from this sector will increase to reflect the rapidly decreasing commodity prices and, previously issued bonds will depreciate in value. We can test for this effect using the price of Sovereign CDS. Figure 50 plots the price of sovereign CDS in a selected number of oil producing countries and reveals what appears to be evidence of an inverse relationship between the recent drop in oil prices and increase in price (and thus yield) of selected sovereign CDS.

¹¹⁶ See Dietrich Domanski, Jonathan Kearns, Marco Lombardi, Hyun Song Shin, "Oil and Debt", BIS Quarterly Review, March 2015 [http://www.bis.org/pub/qtrpdf/r_qt1503f.pdf]

Figure 50: Sovereign CDS price of selected EMEs (primary axis) against Brent crude generic (secondary axis)

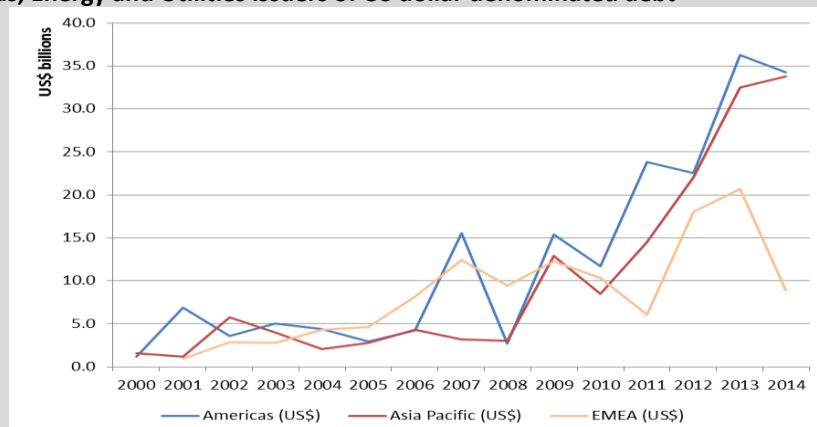


Source: Bloomberg. Note: comparative data not normalized

From a bond funds perspective, it is not clear what the tolerance for losses borne from this dynamic will be. One fear is that there will be a rush to secondary markets in order to offload the depreciated bonds, putting further downward pressure on price.

A further concern is that this theoretical scenario may be compounded in EMEs by an appreciating US dollar. USD-denominated issuances from Oil, Gas, Energy and Utility issuers in EMEs have been on a clear upward trend since 2000, peaking in 2013 (see Figure 51). Although it is worth noting that these volumes are still relatively small. In 2014, volumes reached \$34 billion in the Americas, \$34 billion in Asia Pacific and \$9 billion in EMEA - compared to the emerging market debt universe which has a size of \$6.9 trillion in 2014 and issuance volume reaching \$1.06 trillion.

Figure 51: Oil, Gas, Energy and Utilities issuers of US dollar denominated debt



Source: Dealogic

The exception is Emerging Asia, where issuance from the real-estate/property sector makes up a large chunk of total US and Euro-denominated currency issuance over the last five years. Most of this issuance (73%) has come from China, where the total value of US and Euro-denominated bond issuance from the real-estate/property sector between 2010 and 2014 was \$61 billion. In 2014 alone, USD-denominated bond issuance from the real-estate/property sector reached around \$20

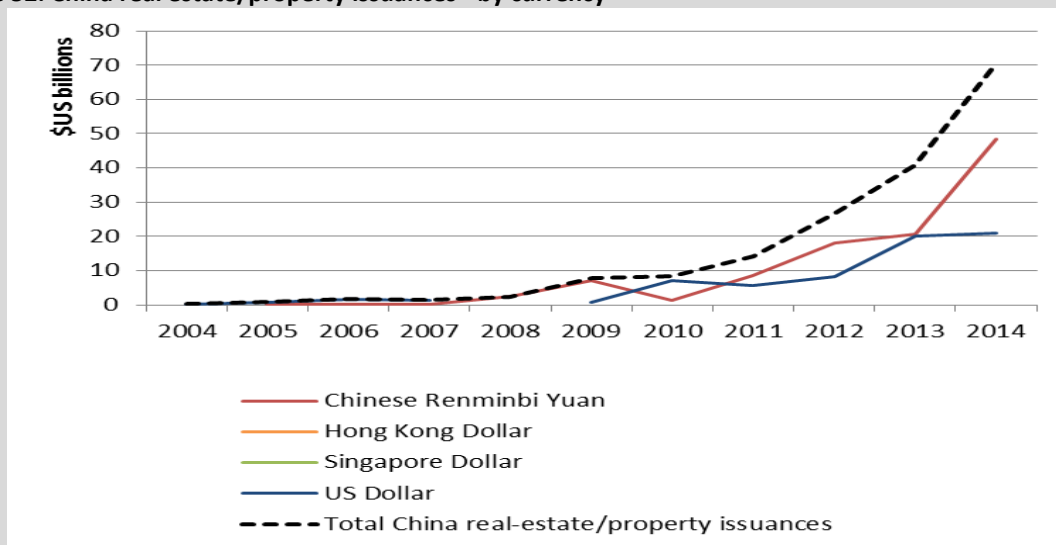
billion.¹¹⁷ The current US dollar-renminbi peg mitigates some currency exchange risk from a strengthening USD, at least in the near-term. Of those \$61 billion issuances, more than half are set to mature in five years or less and 93% are set to mature in 10 years or less. Only around 5% are perpetual issuances.¹¹⁸

Nevertheless, the extent of the impact of a large default(s) of a property developer in China is yet to be observed over the long term. Box 4 presents some additional data around this segment of the bond market in China and elaborates on the recent default of Hong Kong listed developer Kaisa.

Box 4: Real Estate/Property bond issuers - China case study

Growth in bond issuance from real estate/property developers in China has grown substantially over the last ten years. Between 2010 and 2014, issuance increased seven-fold, reaching around \$70 billion in 2014 (see Figure 52). USD issuances from this sector broke through after 2009 and have since been more or less on par with Renminbi issuances, until 2014, where growth in USD issuances flattened and Renminbi issuances more than doubled in a year. In 2014, just less than 1/3 of these issuances were in USD and almost 70% were in Renminbi.

Figure 52: China real estate/property issuances - by currency



Source: Dealogic

While the majority of issuances from the real estate/property sector are investment grade, the same cannot be said when looking only at USD-denominated bonds. Figure 53 shows that while high yield issuances made up only 20% of issuances from the real estate/property sector in China, for USD denominated bonds, HY issuances made up almost 60%. From 2006 to 2010, USD denominated bonds from the real estate/property sector were almost all high yield. This may signal a preference for issuing high yield bonds on international markets or differing criteria in rating between local and international credit rating agencies.

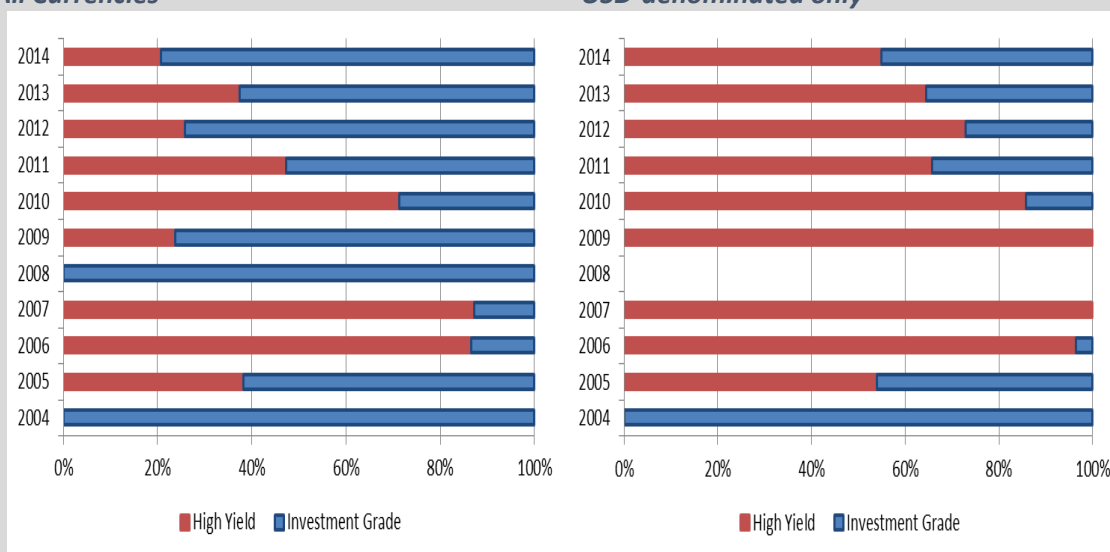
¹¹⁷ Data from Dealogic

¹¹⁸ Data from Dealogic

Figure 53: China Real Estate/Property - HY vs IG

All Currencies

USD-denominated only



Source: Dealogic

Issuer concentration for real estate/property issuers in China is not particularly high. Between 2010 and 2014, the top 10 real estate/property issuers in China accounted for one fifth of issuances from the sector. There are around 22 real estate/property issuers in China that have issued more than \$1 billion USD-denominated bonds over the last five year period. Looking only at USD-denominated bonds, the top ten real estate/property issuers account for around two fifths of all USD-denominated bonds from the sector.¹¹⁹

Early in 2015, Shenzhen-based and Hong Kong-listed Kaisa missed its interest payment on USD bonds, making it the first Chinese real estate/property issuer to risk defaulting on USD bonds. Some commentators have highlighted this as a potential test case for how vulnerabilities in the Chinese property bond market may have spillover effects, perhaps predicating a withdrawal of interest in Chinese property and real estate bonds more broadly.¹²⁰

A report from the World Bank notes that the real estate and property sector has been a key driver of growth but that this is already beginning to change as government policies work to gradually “tighten credit and supply mismatches”.¹²¹ This dynamic may, alongside oversupply issues imply a concurrent weakening of property prices and thus potential revenues for these issuers, which may put pressure on these issuers when it comes to servicing debt. A withdrawal of interest in investing in bonds from this sector may compound the issue.

Nevertheless, as shown in the previous charts, the vast majority of USD-denominated bonds are already high yield rated suggesting that they are predominantly taken up the ‘risk-taking sector’ of the investment community and not more risk-adverse investors such as pension funds. Further defaults may spillover to international markets, warding international investors from taking on further high yield issuances. However, since high yield issuances, especially USD-denominated high yield issuances, are quite small (\$11.5 for USD high yield in 2014), a withdrawal from investment in high yield USD-bonds from this sector alone would be an unlikely trigger for collapse.

¹¹⁹ Data derived from Dealogic.

¹²⁰ Josh Noble, “Kaisa default risks waking China property bears”, January 2015;

¹²¹ World Bank, “China Economic Update”, October 2014

5.2 Roll-over risk

✧ *Emerging market firms may choose to refinance their existing debt through corporate bond markets. Often the motivation for doing so is due to a change in either the interest rate or default risk of the firm – two components that influence the yield on bond offerings. The reason for this is that if either or both the interest rate and default risk of the firm drop, the yield offered on bonds would also reduce, thereby reducing the borrowing costs for the firm. From a firm perspective, rather than continue paying out larger coupon payments than the new market conditions demand, it is more efficient to issue new bonds with the lower yield and use the proceeds to buy back the previously issued bonds.*

However, there is also rollover risk associated with refinancing of debt. Especially when current debt is set to mature and the interest rate and/or the default risk of the firm is on the increase. In this scenario, the cost of rolling over old debt into new debt increases causing financing issues for some firms.

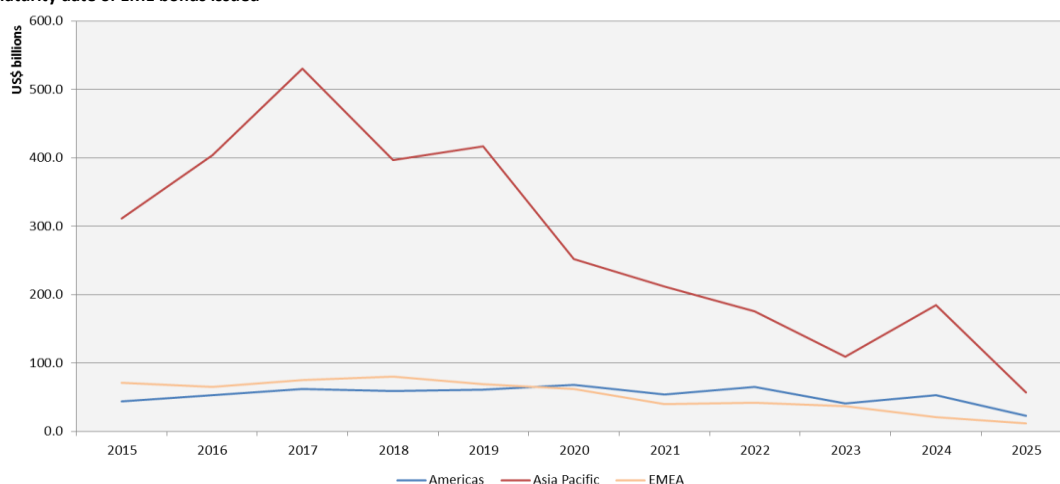
EME firms with bonds maturing the next few years may face roll over risk. This is especially pertinent if interest rates increase in the developed world, the USD strengthens against their local currencies and other internal and external factors impact the credit risk of their bonds.

In the next three years (2015-2017) around \$1.6 trillion worth of EME bonds is set to mature, with around a quarter of this USD- denominated. Figure 54 tracks the maturity date of issued bonds. From a regional perspective, during 2015-2017, \$0.2 trillion of debt is set to mature in Emerging Americas, \$1.2 trillion in Emerging Asia and \$0.2 trillion in Emerging EMEA. In both Emerging Americas and Emerging EMEA, just over half of this debt will be USD-denominated. In Emerging Asia the proportion is much lower at 14%. In total, between 2015 and 2017 \$375 billion worth of USD-denominated bonds from EMEs are set to mature.

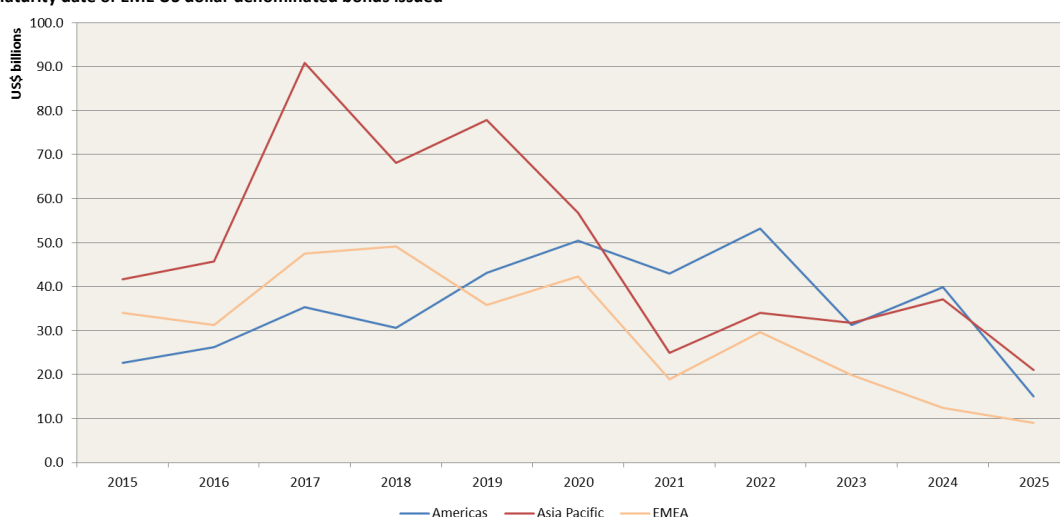
Between 2015 and 2020 around \$3 trillion worth of EME bonds is set to mature, with around 27% of this being US dollar-denominated. Between 2015 and 2020, \$348 billion of bonds are set to mature in Emerging Americas, \$2.3 trillion in Emerging Asia and \$423 billion in Emerging EMEA. In Emerging Americas, 60% of these bonds are USD-denominated, 16% in Emerging Asia and 57% in Emerging EMEA. In total, \$829 billion worth of USD-denominated bonds from EMEs are set to mature in the next six years.

Figure 54: Maturity schedule

Maturity date of EME bonds issued



Maturity date of EME US dollar denominated bonds issued



Source: Dealogic

Of this USD-denominated bonds set to mature in the next few years (2015-2017), the largest individual issuer group is the financial sector. Of the bonds set to mature in this period, the financial sector accounts for 63% in Emerging EMEA, 36% in Emerging Americas and 44% in Emerging Asia. In Emerging EMEA, the next largest issuer group is Oil & Gas (15%). In Emerging Americas, Oil & Gas is only slightly smaller than the Finance sector (34%). Lastly, in Emerging Asia, Real Estate/Property (18%) and Oil & Gas (13%) also have USD-denominated issuances set to mature.

In absolute value terms, no one issuer type of USD-denominated bonds is set to see more than \$65 billion worth of these bonds maturing in the next two years. In Emerging Asia, \$27 billion of USD-denominated issuances from the finance sector are set to mature between 2015 and 2017 and \$24 billion from the Oil & Gas sector are set to mature. In Emerging Asia, \$64 billion will mature in the finance sector and \$20 billion, \$26 billion in the Real Estate/Property segment and \$20 billion in the Oil and Gas segment. In Emerging EMEA, \$63 billion is set to mature in the finance sector and \$16 billion in the Oil and Gas segment.

USD-denominated issuances set to mature in the next few years are concentrated in a few jurisdictions. USD-denominated issuances set to mature in the next few years from the Oil, Gas, Energy, Utilities and Real Estate/Property sectors come mainly from China (29% of all EME issuances), Brazil (13%), South Korea (9%) and Russia (8%). The same type of issuances from the Finance sector come predominantly from South Korea (16%), Russia (15%), Brazil (10%), India (7%), the UAE (7%), China (6%), Qatar (5%) and Turkey (5%).

While rollover risk may very well be a reality given uncertain economic and financial conditions, the extent of this risk will depend on a number of factors requiring further research. For example, the sensitivity of EME firms to rollover risk may depend on how much of the issuance set to mature actually requires refinancing. In many cases, the maturing debt may not need to be refinanced as the project or asset does not require further financing. Furthermore, when it comes to USD-denominated debt, firms issuing on international markets may tend to be on the larger end of the scale meaning that the financing they receive through corporate bond markets may make up a relatively small portion of their total funding structure reducing vulnerability to the market. Lastly, from a systemic perspective, EMEs with large foreign exchange reserves may be able to cover trouble industries in difficult times.¹²² Further research on this issue may provide insight on these factors and the extent of rollover risk faced by EMEs.

¹²² See for further discussion Karina Bubeck, Anjali Doshi, Chelsea Konso, Erchen Yan, "Emerging Market Corporate Bonds: Systemic Risks or Sector Opportunity?", TIAA-CREF Asset Management [May 2015 https://www.tiaa-cref.org/public/pdf/Emerging_Mkt_Corp_Bond_White_Paper.pdf]

5.3 Secondary market liquidity risk

✧ *Based on the available data, and taking into account the increase of the EME corporate bond universe, the liquidity of EME corporate bonds on the US and EU secondary markets has remained relatively stable over the last five years, albeit tight. There is both a supply and demand story that can be understood to be contributing to these conditions. Nevertheless, further research and data gathering would support a more nuanced understanding of the nature of any risk facing EMEs.*

In the first volume of this report series,¹²³ the difficulty in assessing secondary market liquidity conditions was noted. Lack of data; abnormal but temporary global conditions (i.e. low interest rates) spurring primary market issuance; and ‘phantom liquidity’ pre-crisis¹²⁴ are all factors that may hinder understanding of the true trend in corporate bond secondary market liquidity and thus assessment of potential systemic impacts. Keeping this ambiguity in mind, this section of the report presents some available data, indicators and analysis in order to shed light on how EME corporate bonds fair on the US and European secondary markets.¹²⁵

EME financial markets have expanded in terms of size and depth in recent years while secondary market conditions are tight. Improved economic fundamentals as well as attractive yields compared to advanced economies have “encouraged a broader range of investors to increase their investment in the financial assets of emerging market economies.”¹²⁶ However, while primary markets boom in EMEs, domestic secondary markets for corporate bonds are generally small - if they exist at all.

Secondary markets allow previously issued securities to be traded further. Often the functioning of corporate bond secondary markets is compared with those of government bond or equity markets. However, it is important to note that corporate bonds differ from both equity and government bond offerings not only in terms of the nature of the contracts but also when it comes to the reasons for issuing and reasons for investing. In Corporate Bond Markets: Volume 1 – A Global perspective it was noted that:

Box 5: Equity, Government and Corporate bond secondary markets.

- *“Government bond market issuances tend to be standardized with trading already occurring in large volumes over centralized, electronic platforms.¹²⁷ In contrast, corporate bond issuance is sporadic, with varying issue sizes, contractual structures, maturities and coupons across issues. Companies may have hundreds of differing issues outstanding at any one time.¹²⁸ Furthermore, since bondholders are promised principal repayment once the bond matures, bondholders may choose to adopt a ‘buy-and-hold’ strategy.”*
- *“When investor purchases equity there is no promise of principal repayment. Instead, equity holders are part-owners (shareholders) of the firm and are promised dividend payments, based on a number of factors such as firm policy, market performance and market*

¹²³ Rohini Tendulkar, Gigi Hancock, “Corporate bond markets: A global perspective”, IOSCO Staff Working Paper, 2014

¹²⁴ ‘phantom liquidity’ refers to liquidity provided to the market on the back of potentially systemically risk practices. In this case it refers to liquidity added to corporate bond secondary markets pre-crisis by dealer banks because there was an incentive to take on bonds that investors wished to trade, since these bonds could be bundled into structured debt products such as CDOs.

¹²⁵ Data on domestic secondary markets in EMEs is not available to the author of this report.

¹²⁶ IMF, “Global Financial Stability Report: Moving from Liquidity- to Growth-Driven Markets”, April 2014

¹²⁷ Jean-Pierre Casey & Karel Lannoo, CEPS, ‘Europe’s Hidden Capital markets’ 2005

¹²⁸ See BlackRock, ‘Setting New Standards: The Liquidity Challenge II’, May 2013 which notes that large US-based issuers including GE, Citigroup and JP Morgan have over one thousand different bonds outstanding.

assessment of risk. A functioning secondary market is key to equity market performance. When investors purchase equity the intention is often not to simply be reimbursed for bearing risk through dividend payments, but to actually earn profit by selling the equity when share prices rise. In this way expected return on shares is a function of both anticipated capital appreciation and future dividends. However, if a firm defaults, equity owners may not receive compensation.

In comparison, corporate bonds are offered by firms to meet specific financing needs and become part of a firm's debt. A lowering interest rate environment may also spur additional corporate bond issuances as firms rush to take advantage of interest rates below historical levels.¹²⁹ If a firm defaults, it must pay off its debt first before other expenses are covered. From an investor perspective, purchasing a corporate bond essentially means that one is purchasing a future cash stream, based on the yield the bond offers at the time of purchase."

Source: Excerpts from "Tendulkar, Hancock, "Corporate Bond Markets: A Global Perspective", IOSCO Staff Working Paper, 2014.

As such, secondary markets for corporate bonds have traditionally been less active than those for government and equity markets. Furthermore, the predominant structure consists of a non-electronic, market-maker model rather than an all-to-all trading structure.

Nevertheless, having robust secondary markets for corporate bonds is still important element of financial market efficiency. A Green Paper from the European Commission noted: *"providing liquidity is an important function of secondary markets. Liquid and well-functioning secondary markets encourage investments in primary markets too, as this enables investors to sell their investments quickly and at low costs when needed."*¹³⁰ Another benefit is that markets can enhance the provision of information, including on price and volume of trades. For investors in particular, this information can help them make an informed decision which in turn encourages greater participation in the bond market.

Small secondary markets or low liquidity of corporate bonds is encapsulated in the concept of 'liquidity risk'. Liquidity risk reflects the difficulty in selling a bond on the secondary market and is usually incorporated into the yield of the offered bond. The less liquid the bond, the higher the yield offered in order to compensate. A recent study suggests that this dynamic is *"highly significant in explaining cross-sectional variation in yield levels and changes across rated and unrated categories, for both corporate and sovereign issuers. Liquidity risks appear to dominate credit risk in explaining cross-sectional variations in yield spreads for both corporate and sovereign debt instruments across all the emerging markets examined."*¹³¹

The April 2014 Global Financial Stability Report from the IMF highlights potential risk scenarios that may emanate from expanding foreign interest in EME debt, an illiquid secondary market and uncertain global conditions.¹³² As the low interest rate environment in advanced economies pushes foreign investors into EME's higher yielding debt, EMEs become more exposed to contagion, herding and shifts in global conditions. The end-2013 and beginning-2014 'taper tantrum' and bond sell-off, discussed in the first volume of this report series, is one example. Other potential scenarios include

¹²⁹ Christopher Barry, Steven Mann, Vassil Mihov and Mauricio Rodriguez, 'Corporate debt issuance and historical levels of interest rates' *Financial Management*, Vol 37, 2008. Additional issuance of corporate bonds based on expectations around interest rates is explained by the market timing hypothesis, see Baker, M., Wurgler, J. "Market timing and capital structure", *Journal of Finance*, 2002.

¹³⁰ European Commission, "Long-Term Financing of the European Economy", Commission Staff Working Document, 2013

¹³¹ John Hund, David Lesmond, "Liquidity and Credit Risk in Emerging Debt Markets", Tulane University

¹³² IMF, "Global Financial Stability Report: Moving from Liquidity- to Growth-Driven Markets", April 2014

hikes in the U.S. interest rate, and further appreciation of the dollar, further collapse of commodity prices and a normalization of growth rates in large EMEs.

As discussed in Section 5.1 and 5.2, issuing in one's local currency reduces currency mismatches from the issuer's perspective but transfers exchange rate risk from the issuer onto the foreign investor.¹³³ Conversely, issuing in non-local currency, if not hedged, incurs exchange rate risk for the issuer with potentially far reaching implications which will inevitably impact foreign investors as well.¹³⁴ One potential consequence of this could be missed yield payments, difficulties in maturing debt and bankruptcies, which could impact growth and reduce confidence in EME debt, contributing to rollover risk for some firms. In fact, a number of financial crises in emerging economies are attributable to the currency mismatch issue.¹³⁵

In the case of corporate bonds, such a dynamic may spur capital outflows as foreign investors seek to offload EME bonds on the secondary market. If the secondary markets that investors in these EME bonds have access to are limited in size and liquidity, this may prove difficult putting downward pressure on price. Furthermore, since a significant proportion of EME corporate bonds have been scooped up by asset managers,¹³⁶ where clients may choose to redeem funds at any time, the lack of a secondary market activity may mean that getting mark-to-market positions is difficult.

Available data suggests that liquidity of EME bonds on US and European secondary markets has not reduced significantly in the last few years. Nevertheless, there is divergence in terms of level and trend when it comes to bond turnover ratios in each EME region. Figure 55 show that, with the exception of Emerging Americas, where the ratio has grown, the turnover ratios in the EME regions have remained relatively flat. In Emerging Asia, the turnover is the lowest at 5% in 2014, compared to 12% in Emerging Middle East, 24% in Emerging Africa, 38% in Emerging Europe and 52% in Emerging Americas. Corporate bond markets in Asia are almost triple the size of those in Emerging Americas (the 2nd largest regional grouping in terms of corporate bond market size).

Further research may focus on explaining the divergence in the turnover ratio, and general secondary market activity, of EME bonds on US and European Secondary markets, and what implications this may have for primary market issuers in EMEs.

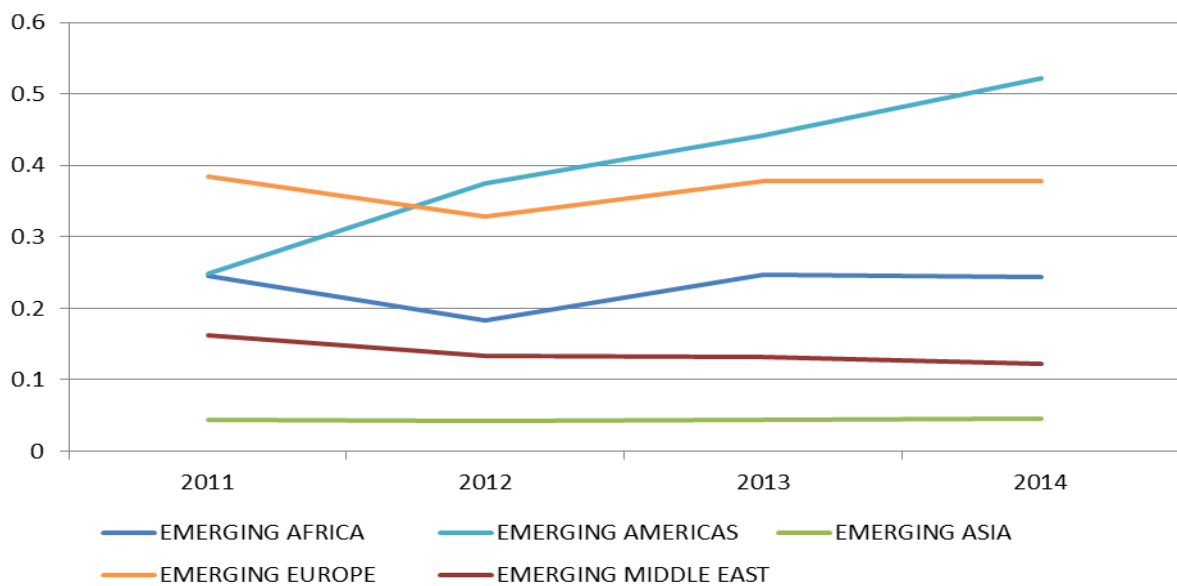
¹³³ Ibid

¹³⁴ See Stefanos Delikouras, Robert F. Dittmar, Haitao Li, "Do Dollar-Denominated Emerging Market Corporate Bonds insure Foreign Exchange Risk?", November 2012.

¹³⁵ Morris Goldstein and Philip Turner, "Controlling Currency Mismatches in Emerging Markets", April 2004,

¹³⁶ Hyun Song Shin, "The Second Phase of Global Liquidity and Its Impact on Emerging Economies", Keynote address at Federal Reserve Bank of San Francisco, Asia Economic Policy Conference, Nov 3-5 2013

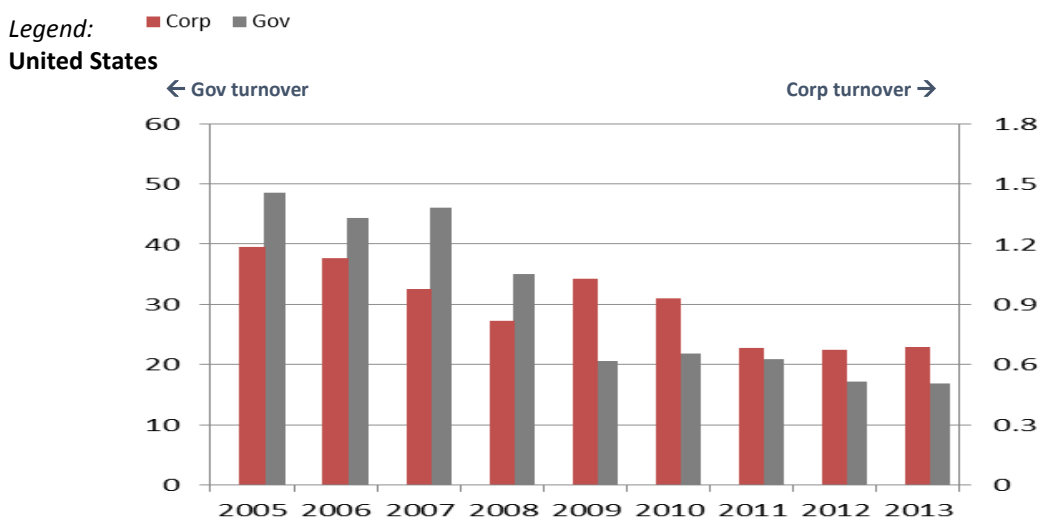
Figure 55: Ratio of trading volume on EU and US secondary markets to total outstanding – by region



Source: US secondary market data from TRACE and MarketAxess, European secondary market data from Trax, a subsidiary of MarketAxess

The ratio of trading of EME bonds on US and EU secondary markets over total bonds outstanding in each EME region is tight compared to the general liquidity of the US secondary markets. The first volume of this report series noted a decline in the bond turnover ratio on US secondary markets (see Figure 56). The bond turnover ratio was measured as the total trading (including of EME issued bonds) over US total bonds outstanding. By 2013, the bond turnover ratio for corporate bonds was just over 60%. A similar reduction was observed for the liquidity of Government bonds. For issuances from Emerging Africa, Emerging Middle East and Emerging Asia liquidity is less than half of this total US secondary market figure.

Figure 56: bond turnover ratio – United States (extract from 1st volume)



Source: SIFMA

However, bond turnover ratios are only one measure of liquidity and do not tell the whole story. Further research is needed. Bid-ask spreads are also considered to be a function of liquidity. The wider the spread (the difference between the price someone is willing to sell a bond and the price someone is willing to buy a bond on the secondary market) the less liquid the market is considered to be. In this way the bid-ask spread can be considered a ‘cost’ of trading – the cost of the illiquidity of the bond.

Another aspect of the bid-ask spread is the concept of 'latent liquidity'. This concept recognizes that a wide bid-ask spread, which may be interpreted as evidence of a lack of liquidity, can actually provide incentives to market-makers and other traders to enter the market and buy up bonds, thus increasing liquidity. This is because a wide spread provides more opportunity for profit to be made, making secondary market activity more attractive. Data on bid-ask spreads for emerging markets is not available to the author of this report.

The bond turnover ratio measures liquidity as trading activity over the size of the bond market. The ratio may decrease either due to the size of bond markets increasing at a faster rate than trading activity or due to trading activity decreasing at a faster rate than corporate bond market size. In the case of EMEs, the driving factor appears to be the denominator expansion of the corporate debt rather than a reduction in trading of EME bonds. In fact trading activity of EME bonds on US and European secondary markets has been relatively flat or even increasing across many, if not most of the EME's with data available.

However, one element that the annual bond turnover ratio does not capture is the drop off in liquidity of individual bonds in the periods after it has been issued. Some empirical evidence suggests that liquidity of corporate bonds reduces exponentially from time of issue.¹³⁷ Another element missed by the bond turnover ratio is that some bonds may be traded over and over while others are not traded at all. The disparity in the liquidity between individual bonds and at different times in a bond's life cycle are important elements to consider when discussing liquidity risk.

Further research may benefit from data gathering on bid-ask spreads of emerging market debt and closer investigation of the liquidity of individual EME bonds – and at different periods in their lifecycle. Consideration of both demand and supply factors (the 'buy and hold strategy', trading incentives etc.) also add nuance to the liquidity risk story. For example, while trading of EME bonds may be low compared to the size of primary markets, this may be precisely because a large amount of primary issuance reduces the need to buy bonds from the secondary markets (i.e. reduces buyer demand on the secondary market). If primary issuance drops off, bonds available on the secondary market may become more attractive (i.e. increase buyer demand on the secondary market).

¹³⁷ See MarketAxess, "Bond Turnover: the long and short of it", 2013:
<http://www.marketaxess.com/research/blog/single.php?permalink=bond-turnover-the-long-and-short-of-it-2013-09-05#.VXbSt2cw99A>

5.4 Systemic risk?

✧ *The emerging market corporate bond universe has expanded dramatically in size in recent years. Internal and external factors – such as currency, interest rate, roll over and idiosyncratic (e.g. fall in commodity prices) risk – may expose vulnerabilities in these markets, with potential systemic implications at the country-level. However, a close and granular look at the data suggests that, at least at this current juncture, the potential for these specific vulnerabilities in corporate bond markets to amount to global systemic risk may be small. This is not to say that EMEs do not face risk. Triggering events such as slowing growth in EMEs, a reversal of capital flows and general negative investor sentiment may impact the ability of EME firms to find the financing needed through bond markets, hindering their ability to continue and grow operations, with further impact on firm solvency and economic growth. Therefore, while the proportion of bonds vulnerable to the risks described in this report may seem small in the context of the EME corporate bond universe, EME corporate bond markets may still be vulnerable to spillovers.*

Global debt (households, governments, corporates and financials) reached \$199 trillion in the second quarter of 2014, according to a report by McKinsey.¹³⁸ Debt is accumulating rapidly in EMEs. According to data from the BIS, total outstanding debt from EMEs reached \$14 trillion in 2013. Almost half (\$6.4 trillion) of this comes from corporate bond markets. As such, investigation into whether accumulation of corporate debt in EMEs poses a potential systemic risk is a salient topic.

In financial terms the concept of ‘risk’ can be broken down into three distinct categories:

- Market Risk (systematic risk), which encapsulates uncertainty related to an entire market segment. This risk can manifest through volatility and is strongly related to the behavior or expected behavior/reaction of market participants to certain events (e.g. and interest rate hike). This risk can be mitigated through hedging.
- Residual Risk, a reflection of general uncertainty that comes with any specific investment – after market risk has been mitigated. This risk can be mitigated through diversification.
- Systemic Risk, is a more broad concept. Systemic risk is defined by the Financial Stability Board as “*the risk of disruption to the flow of financial services that is (i) caused by an impairment of all or parts of the financial system; and (ii) has the potential to have serious negative consequences for the real economy*”.

The risks mentioned previously in this chapter can be broadly categorized according to this taxonomy. Currency mismatch risk and interest rate risk can be considered market risks that can be hedged. Roll over risk, liquidity risk and other idiosyncratic risks can be categorized as residual risk. These types of risks can be balanced through diversification but also through hedging (e.g. through buying CDS and other insurance).

Individually, these risks do not necessarily imply systemic risk. However, these risks can also interact with each other. Tightening secondary market liquidity can expand the credit risk associated with an investment in a bond due to roll-over risk.¹³⁹ Similarly, currency mismatch risk can also be compounded by idiosyncratic risks such as a drop in commodity prices and impact roll-over risk, contributing to credit risk. Interest rate risk can also impact roll-over risk and exacerbate liquidity

¹³⁸Richard Dobbs, Susan Lund, Jonathan Woetzel and Mina Mutafchieva, “Debt and (not much) deleveraging”, McKinsey & Company, February 2015

¹³⁹Zhiguo He and Wei Xiong, “Rollover Risk and Credit Risk”, *Journal of Finance*, April 2012

risk (see Volume 1 for further discussion). These possible interactions suggest a basis for assessing the potential for systemic risk in EME corporate bond markets.

In taking such a perspective there are two large contextual transitions relevant to discussion on EME corporate debt to be considered. Firstly, EME corporate bond markets are shifting from being markets largely driven by monetary policy in AEs; towards a market that will be driven more by fundamentals.

Over the last few years the fast growth in corporate bond issuance in EMEs is notable, stimulated by monetary policies in the AEs. But it also represents an important ‘financial deepening’, whereby as an economy and its financial markets mature, the provision and access to financial products and activities expand.¹⁴⁰ It is this increase in issuance which is the dominant factor in the tightening of some liquidity measures such as the bond turnover ratio – while trading activity indicators are not necessarily declining and are instead increasing in some cases.

Secondly, discussions of risks emanating from EME ‘corporate debt’ may require a shifting away from treating EME corporate debt as a homogenous source of risk and towards recognition of its diversity and need for more granular, country-level and even firm-level assessment.

To underscore this last point, we can construct a few scenarios to understand the current vulnerability posed by the expanding EME corporate bond universe. All data reported in the below examples are sourced from Dealogic, unless otherwise indicated.

Scenario (1) - The strengthening US dollar and currency mismatch risk

Over the most recent five-year period (2010 to 2014) around \$1 trillion of issuances from EMEs were USD-denominated. On the face of it, this may suggest significant exposure to currency mismatch risk from EME firms. Taking a more granular approach, we notice firstly that these issuances are spread unevenly across 66 separate countries. Furthermore, 30% of these issuances are from EMEs who either use the USD as their primary or alternative currency or where their currency is pegged to the USD (20% individually from Chin). Firms issuing in USD from these EMEs are not as vulnerable to currency mismatch risk posed by a strengthening USD. This leaves around \$700 billion (70%) of USD issuances between 2010 and 2014 from EME firms theoretically vulnerable to a strengthening of the USD. Of course, in practice, pegged currencies may still be vulnerable to shock depreciations and therefore currency mismatch risk (see Box 6 on China’s recent currency devaluation).

Of the 70% of USD-denominated issuances from vulnerable EMEs, only in Brazil, Russia and Mexico did issuance of USD-denominated corporate bonds between 2010 and 2014 reach around the \$100 billion mark.¹⁴¹ However, in Brazil, 33% of their USD-denominated issuances come from export-oriented industries such as Oil & Gas, Forestry and Paper and Mining. In Russia, 29% comes from these industries and in Mexico 38% comes from these industries. Export-oriented industries are less exposed to currency mismatch risk due to their natural hedge (their revenues tend to be in hard currencies such as USDs, matching their non-local currency liabilities). As such, of this \$700 billion of USD-denominated issuances from EMEs between 2010 and 2014 – only around \$527 billion would likely be vulnerable to currency mismatch risk (see Figure 58) – equivalent to around \$100 billion of

¹⁴⁰ See for further discussion Karina Bubeck, Anjali Doshi, Chelsea Konsko, Erchen Yan, “Emerging Market Corporate Bonds: Systemic Risks or Sector Opportunity?”, TIAA-CREF Asset Management [May 2015 https://www.tiaa-cref.org/public/pdf/Emerging_Mkt_Corp_Bond_White_Paper.pdf]

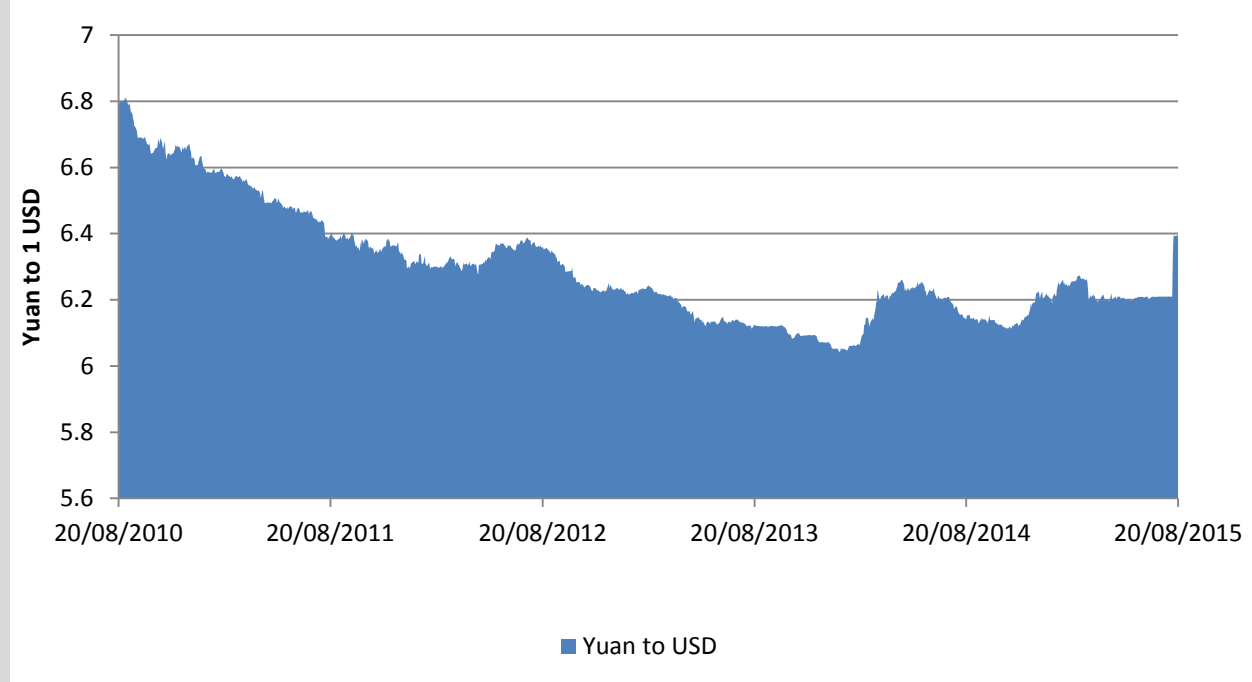
¹⁴¹ In South Korea and India issuance of USD-denominated corporate bonds was around the \$50 billion mark. In Chile, Turkey, Indonesia, Columbia issuance of USD-denominated corporate bonds between \$20 and \$40 billion. In Peru, Israel, South Africa, Thailand and Kazakhstan issuance of USD-denominated corporate bonds was between \$10 and \$20 billion.

issuance a year. Of this, issuances from Brazil (\$107 billion) makes up 20%, Russia (\$70 billion) makes up 13% and both Mexico and South Korea make up 11% each (around \$59 billion each). For India, Chile and Turkey issuance volumes are small but still significant at around \$25 and \$40 billion over five years.

Box 6: China and currency devaluation

In August 2015, China’s currency was allowed to devalue against the US dollar. Between the 10th and 13th of August, the Yuan dropped around 3% against the USD, a four year low (see Figure 57). This devaluation was followed by other emerging market currencies.¹⁴²

Figure 57: Yuan against USD



Source: Bloomberg

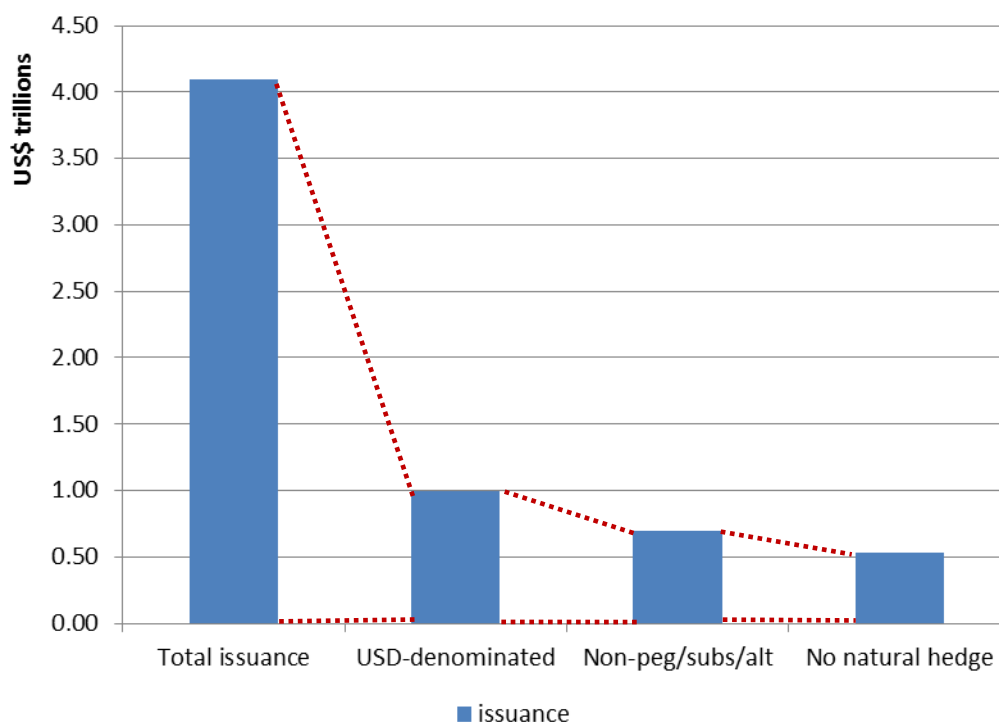
The move followed the announcement by the People’s Bank of a new policy concerning the valuation of the Yuan.¹⁴³ Essentially, instead of basing the value of the Yuan solely on previous day movements, the valuation would now take into account market forces. Some commentators¹⁴⁴ notes that this new policy allows for more sudden appreciations and depreciations. In fact, the sudden depreciation this August constitutes the largest one day fall in ten years.

¹⁴² For example the currencies of Kazakhstan, Vietnam, Turkey and India

¹⁴³ Keith Bradsher, “China Turned to Risky Devaluation as Export Machine Stalled”, New York Times, August 17, 2015

¹⁴⁴ Phillip Inman, Martin Farrer, Fergus Ryan, “China stuns financial markets by devaluing yuan for second day running”, The Guardian, Wednesday 12 August, 2015

Figure 58: (Scenario 1) Currency miss-match risk - vulnerable bond issuance between 2010 and 2014



Source: derived from Dealogic data

Note: Read as total issuance from EMEs; of this total USD-denominated issuance; of this issuance from EMEs with currency not pegged to USD and/or which don't use the USD as main or alternative currency; of this issuances from sectors without natural hedge.

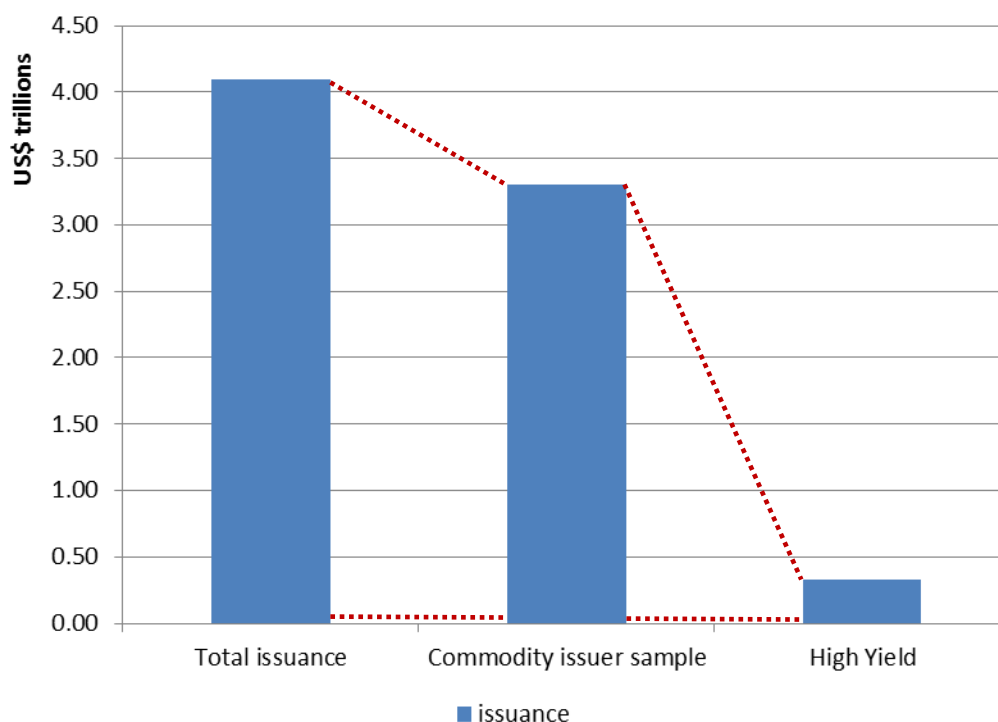
Scenario (2) – Falling commodity prices and credit risk

The risks posed by falling commodity prices can also have implications for firms needing to service debt (credit risk) from these sectors. Taking a sub-sample of hard commodity issuers (issuance from Oil & Gas, Mining, and Forestry and Paper), we see that between 2010 and 2014 there were around \$3.3 trillion billion of issuances from EMEs. This confirms that issuers vulnerable to falling commodity prices indeed make up a significant part of the overall EME corporate debt universe.¹⁴⁵

Difficulties in servicing debt in the event of falling commodity prices are more pronounced for high yield issuers. However, across the EMEs under investigation, only around 10% of export-oriented issuances are high yield (\$331 billion between 2010 and 2014), a relatively small number.

¹⁴⁵ Almost half of this figure (48%) came from China. 42% came from South Korea, Russia, India, Brazil, Mexico, Malaysia, Thailand, Taiwan and the United Arab Emirates. In South Korea, total issuance between 2010 and 2014 reached \$456 billion. In Russia, India and Brazil total issuance was around the \$200 billion mark. In Mexico, Malaysia and Thailand issuance was between \$130 and \$70 billion. In Taiwan, the United Arab Emirates and Chile issuance was between \$40 billion and \$50 billion. In Turkey, Columbia, Saudi Arabia, Indonesia, Qatar and the Philippines, issuance was between \$20 and \$40 billion. For the rest of the EMEs issuance was less than \$20 billion.

Figure 59: (Scenario 2) Commodity-based issuers - vulnerable bond issuance between 2010 and 2014



Source: derived from Dealogic data

Note: Read as total issuance from EMEs; of this issuance from selected commodity export-oriented issuers; of this high yield issuances.

Of these high yield issuances, 26% come from Russia.¹⁴⁶ 20% of these issuances come from China.¹⁴⁷ Issuances from India and Brazil together make up 23% of high yield issuances from these export-oriented sectors (reaching \$45 billion and \$34 billion respectively).¹⁴⁸ Mexico, South Korea, Philippines and Indonesia all have issuance totals between 2010 and 2014 greater than \$10 billion but less than \$25 billion. In the Philippines and Indonesia, high yield issuances make up more than half of total issuances from these sectors in these two countries. For the majority of other EMEs with issuance in these sectors, more than half of their issuance is also high yield. However, in general issuance volumes in these countries are low - only in the Ukraine and Jamaica was high yield issuance greater than \$5 billion over five years. As such, of the \$3.3 trillion issuances from EMEs coming from the selected export-oriented industries over the last five years, only \$331 billion are particularly vulnerable to issues in servicing debt.

Of note is the interaction with this risk with the appreciation of the US dollar. Commodity industries tend to be export-oriented and the appreciation of the dollar may actually be a net positive. This is because EME export-oriented firms will be earning in USD while their costs remain in the depreciating local currency. Also commodity contracts are normally struck in USD.

¹⁴⁶ In Russia, just less than half (43%) of all issuances from these sectors are high yield (\$87 billion).

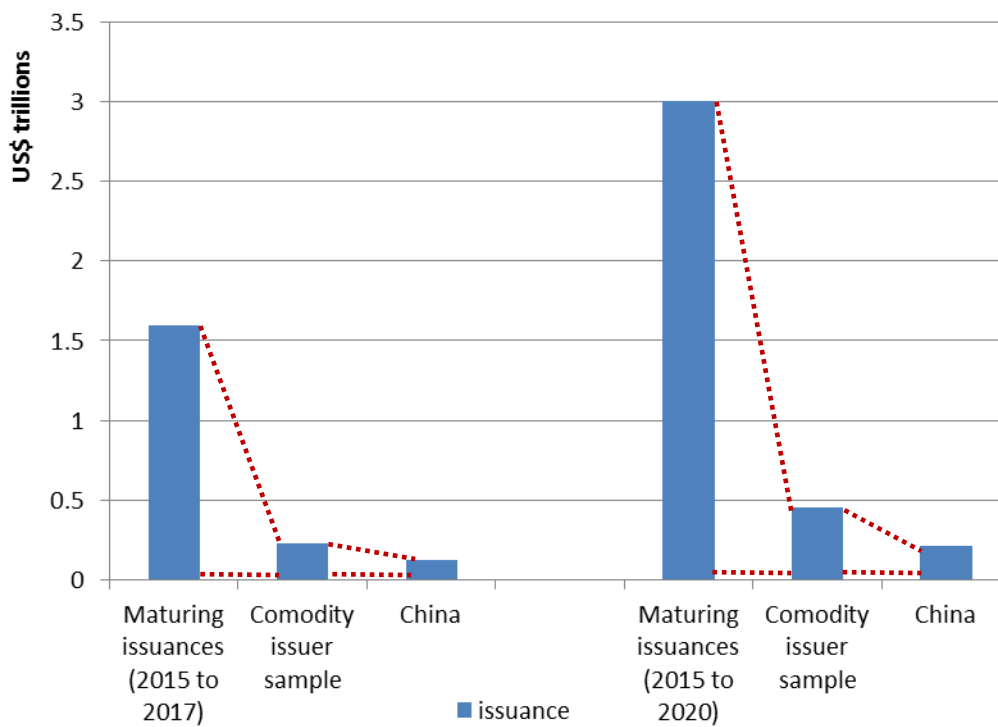
¹⁴⁷ In China, just 4% of issuances from these sectors are high yield (\$68 billion).

¹⁴⁸ In India, these high yield issuances make up a quarter of issuances from these sectors. In Brazil these issuances make up one fifth.

Scenario (3) – Roll-over risk exacerbated by falling commodity prices

In terms of roll-over risk, we can investigate a few different scenarios. In this scenario, further dwindling of commodity prices may hit the earnings of a group of issuers making it difficult for them to rollover their debt. In the next three years (2015 to 2017) around \$229 billion worth of issuances from these sectors is set to mature. In the next six years (2015-2020) around \$456 billion worth of issuances are set to mature. Around half of these issuances set to mature over the next three and six year period come from China (\$123 billion set to mature in the next three years and \$212 billion set to mature in the next six years). In Russia, Brazil, South Korea and Mexico between \$10 and \$15 billion of these issuances are set to mature in the next three years and between \$25 billion and \$45 billion of these issuances are set to mature in the next six years. For the rest of the EMEs with issuances set to mature from these sectors, maturity volume for each country is less than \$7 billion over the next three years and less than \$10 billion in the next six years. Figure 60 presents this break-down in graphical form.

Figure 60: (Scenario 3) rollover risk and falling commodity prices - vulnerable bond issuances between 2010 and 2014



Source: derived from Dealogic data

Note: Read as total maturing issuances from EMEs; of this maturing issuances from selected commodity export-oriented issuers; of this maturing issuances from China alone.

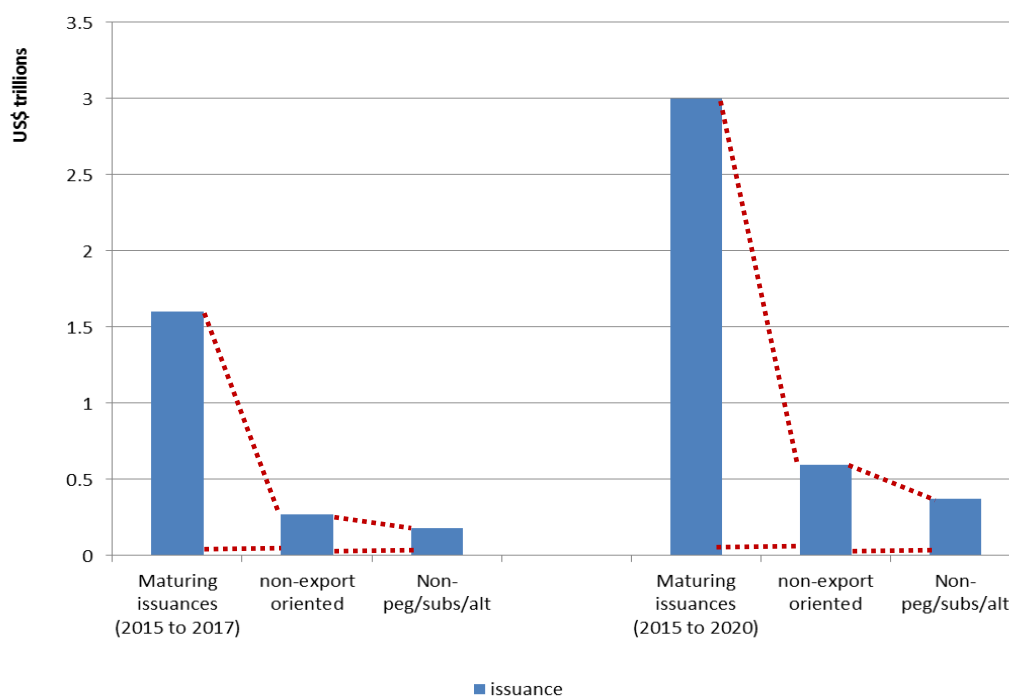
Scenario (4) – Roll-over risk exacerbated by strengthening US dollar

In this scenario, strengthening of the US dollar may exacerbate roll-over risk for USD-denominated issuances from EMEs, specifically those that may not have a natural hedge (e.g. export-oriented). If we look at the maturity schedule for EME issuances from non-export-oriented issuers in USD we see that in the next three years \$268 billion is set to mature across all EMEs. In the next six years \$593 billion is set to mature. Around one third of these issuances set to mature in the next three years and around 38% of these issuances set to mature in the next six years come from EMEs with

currencies pegged to or substituted by the US dollar, where currency mismatch risk is mitigated.¹⁴⁹ In other words, in the next three years, just \$180 billion of issuances in USD from non-export-oriented industries and from countries whose currencies are not pegged to or substituted by the USD will mature - \$370 billion in the next six years. This breakdown is provided in Figure 61.

Of the \$180 billion, 22% come from South Korea, 18% come from Russia, 13% come from Brazil, 8% from India and 8% from Mexico and 4% from Turkey. Of the \$370 billion, 16% comes from Russia, 16% comes from Brazil, 14% comes from South Korea, 10% comes from India, 9% comes from Mexico, 6% comes from Turkey and 3% comes from Indonesia. High yield issuances make up around a quarter of these issuances with about \$68 billion high yield issuances from EME firms set to mature in the next three years and \$146 billion set to mature in the next six years. Most of these High Yield issuances are coming from Russia, Brazil and Mexico. For the rest of EMEs, issuance volumes set to mature of these high yield issuances are less than \$4 billion in the next three years and less than \$10 billion in the next six years.

Figure 61: (Scenario 4) Roll-over risk and a strengthening USD – vulnerable bond issuances between 2010 and 2014



Source: derived from Dealogic data

Note: Read as total maturing issuances from EMEs; of this maturing issuances from non commodity export-oriented issuers (selected); of this maturing issuances from EMEs with currency not pegged to USD and/or which don't use the USD as main or alternative currency.

A closer look at the current vulnerabilities stemming from liquidity risk

From a systemic risk perspective, the volumes of corporate bonds from EME firms particularly vulnerable to currency mismatch, credit, rollover and other idiosyncratic risks such as falling commodity prices in this sample are quite small compared to the EME corporate bond universe.

Unsurprisingly, most of the issuance that can be deemed 'vulnerable' in the aforementioned scenarios comes from the largest EME economies (in terms of GDP). In the first scenario, most of the vulnerable issuances are coming from Brazil, Russia, Mexico and South Korea, India, Chile and Turkey

¹⁴⁹ 20% of USD non-export oriented issuances set to mature in the next three years come from China, 17% come from South Korea, 14% come from Russia and 10% come from Brazil.

to a lesser extent. In the second scenario, vulnerable issuances mainly come from Russia and China with significant issuance volumes also coming from India, Brazil, Mexico, South Korea, Philippines and Indonesia. In the third scenario, vulnerable issuances come predominantly from China, followed by Russia, Brazil, South Korea and Mexico. Lastly, in the fourth scenario issuances from South Korea, Russia, Brazil, India, Mexico and Turkey may be vulnerable.

A concern from a systemic risk perspective is that triggering events affecting corporate debt, along the line of what was described in the above scenarios, combined with an illiquid secondary market could have potential implications for financial stability. If corporate bonds cannot be offloaded through the secondary market, unwinding positions could become prohibitively expensive, further exacerbating market stress in a 'sell-off scenario' as investors adjust their risk preferences.

In assessing this potential source of systemic risk in the context of EME corporate bonds, there are three dimensions to consider:

- (1) According to a report from Black Rock,¹⁵⁰ the majority of emerging market corporate and sovereign debt is held by dedicated emerging market portfolios. These portfolios are owned by institutional investors such as local market insurance companies, pension funds and strategic institutional investors. They are mainly buy-and-hold investors where secondary market liquidity is not such an urgent concern.¹⁵¹ In other words, they are holding for yield, to match their liability duration. The relative illiquidity of EME corporate bonds can actually be attractive to buy-and-hold investors, since these bonds tend to offer superior returns.¹⁵² A very small proportion is held by retail mutual funds and an even smaller proportion is held by ETFs.¹⁵³
- (2) In many of the above scenarios, EME issuance of 'vulnerable' corporate bonds is small. Furthermore, the market and residual risks faced can be and are hedged e.g. through the derivatives market.

Trading activity, on US and European secondary markets, of EME bonds varies significantly. Of the EMEs identified through the scenario analysis, there is an even split between those with declining and those with increasing bond turnover ratios over the last four years (see Figure 62).

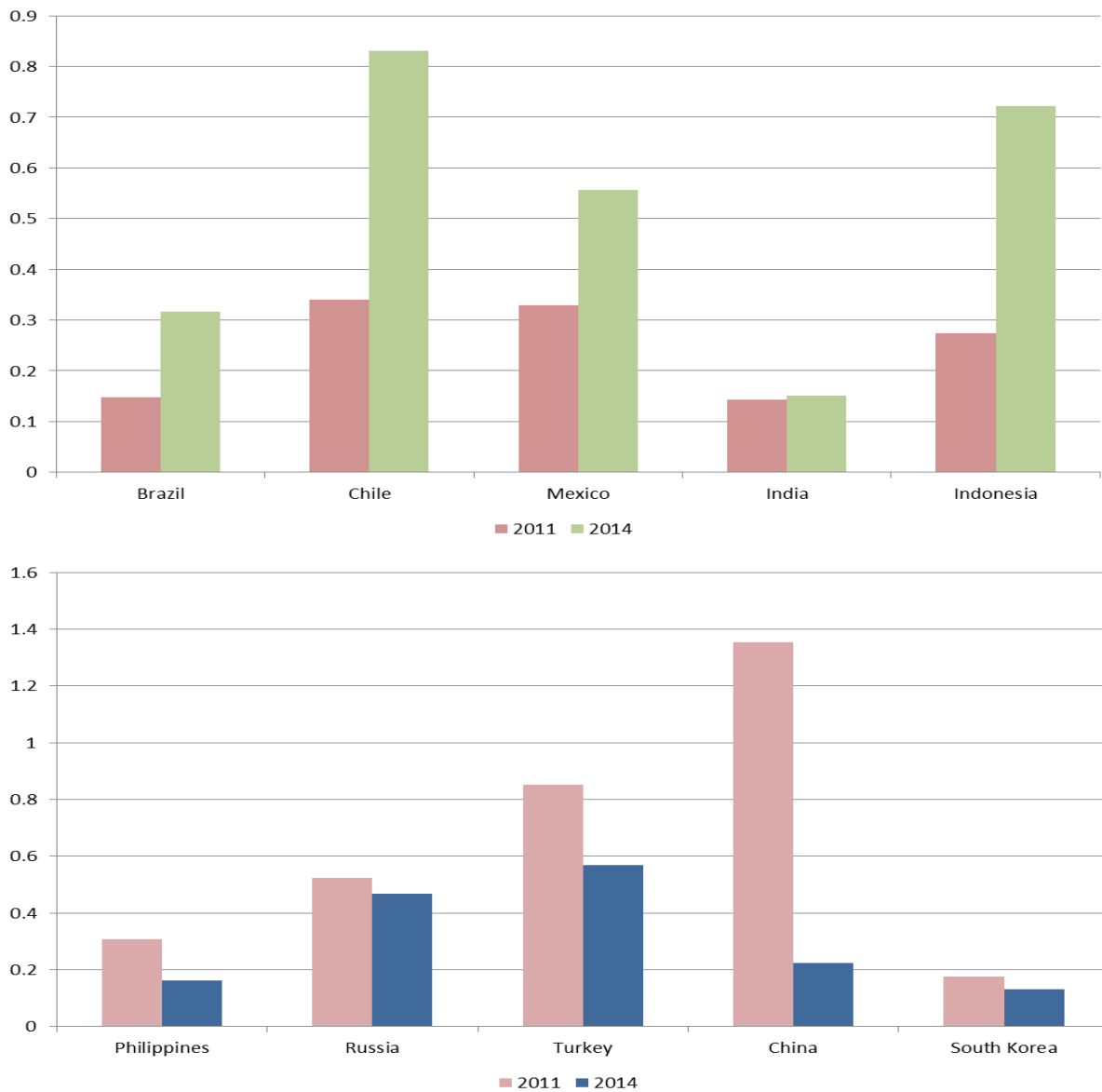
¹⁵⁰ Black Rock, "Who Owns the Assets", Viewpoint, September 2014

¹⁵¹ CMM Research Note, "Market Liquidity in Emerging Markets: How bad is it?", Institute of International Finance, June 1, 2015,

¹⁵² Black Rock, "The Liquidity Challenge", June 2014

¹⁵³ Black Rock, "Who Owns the Assets", Viewpoint, September 2014

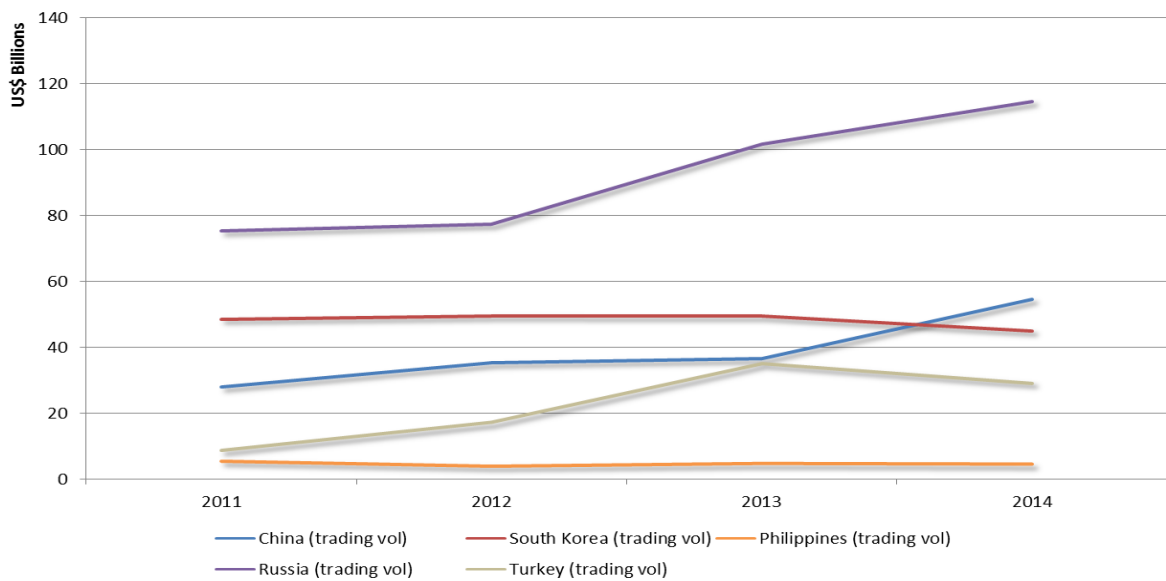
Figure 62: Bond turnover ratios (Trading of EME bonds on US/European secondary markets over country outstanding) comparison - selected EMEs



Source: US secondary market data from TRACE and MarketAxess, European secondary market data from Trax, a subsidiary of MarketAxess

In those selected EMEs with declining bond turnover ratio, firms from Russia and China, the largest issuers of ‘vulnerable’ bonds in the group have seen increased trading activity of their bonds over the last four years (see Figure 63)

Figure 63: Trading activity comparison - selected EMEs



Source: US secondary market data from TRACE and MarketAxess, European secondary market data from Trax, a subsidiary of MarketAxess

Analysis of the available data suggests that while the ingredients of potential systemic risk may indeed exist in the EME corporate bond universe, at least in aggregate, the vulnerability itself is spread across different EMEs. Further monitoring of developments in EME corporate bond markets may be useful in understanding how these risks evolve going forward. However, assessments from a systemic risk perspective should include a country- and firm-level differentiation.

Chapter 6: Conclusion and Further Topics for Research

The analysis in this report aims to be fact-based and descriptive and is based on extensive data gathering and analysis efforts. The findings can be broken down around three main themes:

1. *Corporate bond market development;*
2. *Corporate bond market activity;*
3. *And risks and vulnerabilities.*

- *Corporate bond market development*

On point 1, the data presented in this report confirm that corporate bond markets in EMEs, while small compared to bank and equity market sectors are growing in size and constitute an increasingly important financing channel. Concerted policy focus appears to be one underpinning factor in the robust development of some EME corporate bond markets. In a number of cases, policy measures put in place to increase the resiliency and robustness of the financial sector in the wake of these crises has laid the foundations for the further development of corporate bond markets.

Other factors related to the development of corporate bond markets cover a suite of economic, financial and institutional elements. Results from econometric regression indicate that domestic corporate bond market development is related predominantly to general financial development and infrastructure-based improvements in an economy. While international corporate bond market development is also related to institutional health. Additional possible determinants of corporate bond market development, requiring further analysis and data, include the impact of international credit rating services and tax treatment.

- *Corporate bond market activity*

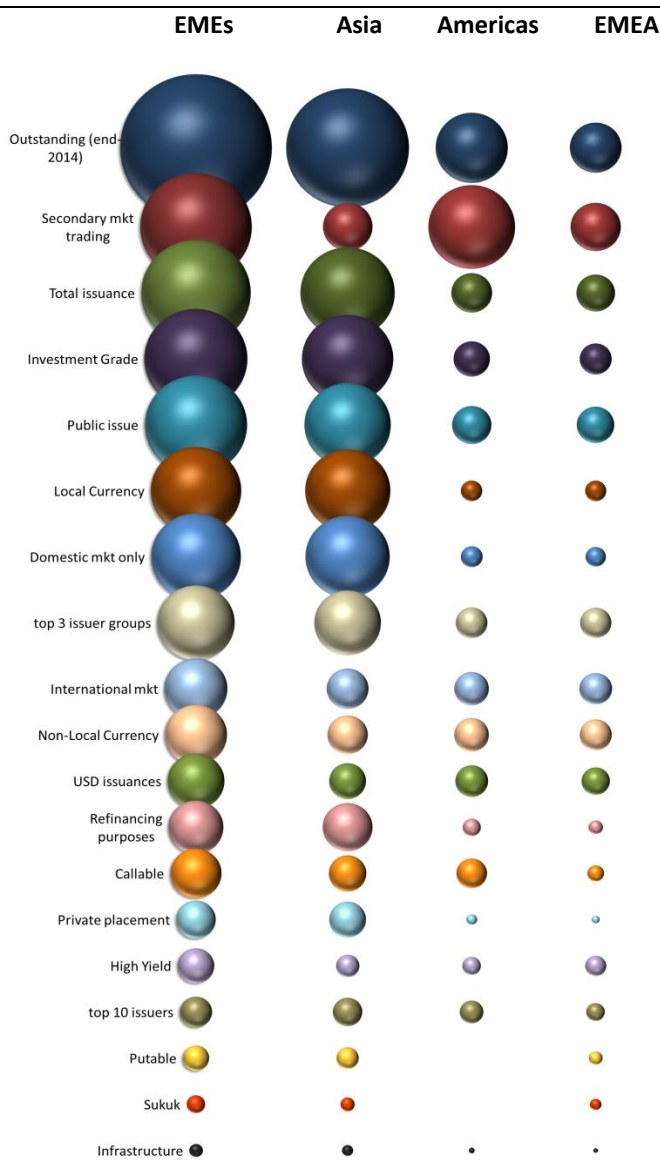
On point 2, some of the findings of the analysis in the report can be summarized and visualized in Figure 64. On the y-axis, this Figure tracks the size (\$ value) of various dimensions of corporate bond markets in EMEs (between 2011 and 2014). On the x-axis, this breakdown is applied across the three emerging market regions. For this period, in aggregate, corporate bond market outstanding (end 2014) is greater than secondary market trading (between 2011 and 2014). Secondary market trading is on par with total issuance. The vast majority of issuance is investment grade (89%) and publically issued (87%). Further the majority of issuances are in local currencies (68%) and available on domestic markets only (67%). The top three issuer groups (Finance, Construction /Building, Oil & Gas) make up half of all issuances in the period. Issuances in Non-Local currencies are mostly USD-denominated (84%).

Refinancing issuances and callable issuances make up a small proportion of total issuances (25% and 22% respectively). A smaller amount of issuances are privately placed (13%) and an even less are high yield rated (11%). The top 10 individual issuers account for 8% of total issuances. Puttable, Sukuk and Infrastructure issuances make up less than 7% of total issuances in the period.

This aggregate profile is most representative of Emerging Asia. This is not surprising since issuances from Emerging Asia make up 74% of all issuance from EMEs. One interesting difference between the aggregate EME and Emerging Asian profile is that in the latter case, outstanding and issuance far out shines secondary market trading. Other than that, most of the issuances are investment grade (94%), publically issued (85%), in local currency (82%) and on domestic markets only (80%). The top three issuer groups account for half of total issuances. Non-local currency

issuances are on par with issuances on international markets (18%-20%), and USD issuances seem to make up the vast majority of non-local currency issuances (85%). Refinancing issuances make up almost one third of all issuances. Callable and privately placed issuances account for around 15% each of all issuances. Top ten issuers account for 1/10 of all issuances. High Yield, Putable, Sukuk and Infrastructure issuances each make up less than 7%.

Figure 64: breakdown of markets (2011-2014)



In Emerging Americas, the profile is quite different. Here secondary market trading over the last four years is larger than outstanding in 2014. Total issuance from this region accounts for 14% of issuances from EMEs. Similar to Emerging Asia, most of this issuance is investment grade (79%) and publically issued (93%). However, unlike in Emerging Asia, the majority of issuance is in non-local currency (65%) and available on international markets (72%). 89% of non-local currency issuances are USD-denominated. The top three issuer groups account for a comparatively larger percentage of all issuances in the region (60%), compared to Emerging Asia. Callable issuances also represent a larger proportion of total issuances (56%), while refinancing issuances constitute a smaller proportion (19%). A very small proportion of issuances are privately placed (7%), infrastructure issuances make up just 2% and there are no putable or Sukuk issuances in the region, during the period.

The profile of Emerging EMEA mirrors more closely the profile of Emerging Americas, but with some differences. Firstly, secondary market trading issuance from this region is on par with outstanding and larger than issuance over the period 2011-2014. Issuances from this region made up just 12% of issuances from EMEs.

Source: IOSCO Research Department based on data from Dealogic, BIS, internal data gathering and local authority websites.

In line with the other regions, the majority of issuances are investment grade (70%).

They are also mostly publically issued (96%). Similar to Emerging Americas but different to Emerging Asia, most issuances are in nonlocal currency (70%) and available on international markets (71%). 78% of non-local currency issuances are USD-denominated. The top three issuers account for 66% of all issues, a higher proportion than in Emerging Asia and Emerging Americas. High Yield issuances account for 30% of issuances from the region, also a higher proportion than the other two regions. Refinancing and callable issuances account for a relatively small proportion of total issues (14% and 18% respectively). The top 10 individual issuers account for a relatively significant proportion of total issuances (23%). Putable issuances account for 13% of total issuances

in the region, the highest proportion across the regions. Sukuk issuances account for 9% of issuances and infrastructure issuances account for just 1%.

These profiles highlight the heterogeneity of the nature of corporate bond markets across EMEA regions. In recognizing this heterogeneity, this report has provided analysis at both the country- and regional-level. Such a granular perspective is also important when assessing risks and vulnerabilities.

- *Risks and vulnerabilities*

On point 3, growing corporate bond markets may represent a transition towards financial deepening in EMEs, with plenty of associated benefits. At the same time, the rate of growth, especially in the context of macro-economic and political developments at the global scale may expose vulnerabilities.

These vulnerabilities may manifest through currency mismatch risk and credit risk; roll-over risk; and secondary market liquidity risk. Individually, these risks do not necessarily imply systemic risk. However, these risks can also interact with each other. Triggering factors may include developments such as falling commodity prices, appreciation of hard currencies (e.g. USD), hike in interest rates in the developed world; and the bursting of asset bubbles (e.g. in the real estate sector).

While these vulnerabilities may have far-reaching implications at the country-level, especially when taking into account other macro-economic factors; a closer, more granular look at the data suggests that, at least currently, the potential for these specific vulnerabilities in corporate bond markets to amount to global systemic risk may be small, relatively speaking. This is not to say that EMEs do not face risk. Triggering events such as slowing growth in EMEs, a reversal of capital flows and general negative investor sentiment may impact the ability of EME firms to find the financing needed through bond markets to continue and grow operations, with further impact on economic growth.

The interaction with liquidity risk is also not so clear-cut. Liquidity conditions in EMEs vary significantly. Of the EMEs identified as having 'vulnerable' bond issuance through the analysis of various scenarios, there is an even split between those with declining and those with increasing bond turnover ratios over the last four years.

Further research on risks and vulnerabilities will benefit from continuing to recognize the diversity across EMEs – and need for granular, country-level and even firm-level assessment.

Further research

This report attempts to paint a comprehensive picture of EME corporate bond market development, activity and vulnerabilities. Nevertheless, data gaps still remain that somewhat constrain the reach of the analysis. In order to overcome these constraints, focus for useful additional data gathering efforts and research could include:

- *Secondary Markets*
 - Trading volume (activity) on domestic secondary markets across EMEs;
 - Trading volume of EME bonds over their life-cycle;
 - Data on bid-ask spreads for EME bonds;
 - Information on the type of trading platforms available e.g. OTC vs exchange vs other;
 - Information on Pre- and post-transparency conditions.

- Further research may focus on explaining the divergence in the turnover ratio, and general secondary market activity, of EME bonds on US and European Secondary markets specifically, and what implications this may have for primary market issuers in EMEs.
- *Investor characteristics*
 - One significant data gap constraining the analysis in this report concerns investor characteristics. Useful additional data could include:
 - Types of investors: retail vs institutional; industry groupings etc.
 - Predominant investor strategies (buy and hold etc.)
 - Local vs foreign investor breakdown
 - Investor concentration
- *Issuance:*
 - Characteristics of firms that issue debt
 - Underwriter concentration
 - Credit enhanced issuances
 - Private rebate issuance structures
- *Regulatory environment:*
 - Regulation/disclosure regimes
 - Tax treatment
 - Bankruptcy laws
- *Other areas:*
 - Other forms of financing available to EME firms e.g. securitization
 - Use of hedging products including examination of the CDS market for EME firms
 - Access to international and local credit rating agencies

Technical Appendix 1 – Correlation Analysis

Data

Correlation analysis is used to examine the relationship between a number of economic, financial and institutional conditions in EMEs and:

- (1) Corporate bond market size:
 - a. Average corporate bonds outstanding between 2004-2013.
- (2) Corporate bond market importance in relation to the real economy
 - a. Average corporate bonds outstanding as a percentage of GDP between 2004 and 2013.
- (3) Corporate bond market growth:
 - a. Compound annual growth rate of corporate bond outstanding between 2004 and 2013 approx.

A Kendall tau non-parametric correlation test (see [Annex 1.1](#) for description) is selected to investigate relationships, using 62 EMEs as a basis (see [Annex A](#) for list of countries). Corporate bond market data is split into domestic outstanding and international outstanding, due to the differing factors (types of investors, motivations for lending, infrastructure needs etc) underpinning these two corporate bond markets.¹⁵⁴ The variables under investigation are listed in Table 3. A statistical description of the data is provided in [Annex 1.2](#). Data is incomplete for some EMEs. All data points have been used where available.

Table 3: Variables for analysis

<i>The economic factors under consideration include:</i>	<i>The financial factors under consideration include:</i>
<ul style="list-style-type: none"> • Gross Domestic Product • Per Capita Gross Domestic Product • Foreign Direct Investment, stock • Government bonds • Consumer Price Index 	<ul style="list-style-type: none"> • Size of banking sector • Size of Equity markets • Number of listed companies • Population with account at financial institution (financial inclusion) • Marginal Corporate Tax rate
<i>Country conditions:</i>	<i>Institutional factors under consideration include:</i>
<ul style="list-style-type: none"> • Country credit risk premium • Political Stability and Absence of violence/terrorism • Ease of doing business • Control of corruption 	<ul style="list-style-type: none"> • Government Effectiveness • Regulatory Quality • Rule of Law • Credit depth of information

¹⁵⁴ Domestic corporate bond outstanding includes local currency corporate bonds issued for domestic investors and by domestic lenders. International corporate bond encapsulates everything else.

Method:

For the purposes of this report, a Kendall Tau non-parametric rank correlation coefficient is used to identify possible associations between the variables under consideration. A list of variables used, including sources and descriptions are given in [Annex B](#).

A Kendall Tau correlation has been chosen to underpin this analysis for a number of reasons. Most of the data under analysis is not normally distributed. This property negates the use of the more commonly used Pearson product-moment correlation. The Kendall Tau allows identification of trends in non-normally distributed data through ranking, which is less sensitive to outliers. The coefficient measures the difference between concordant and discordant rank pairs in a dataset and as such can capture non-linear dependencies between variables. In addition, Kendall's Tau allows better interpretation of the strength of associations between variables, compared with Spearman's rho correlation.

For all statistical analyses in the body of this report, the level of significance is set at $P < 0.05^{**}$ or $P < 0.01^{***}$ in the tables. Correlations were calculated using the Gretl statistics pack.

Results:

Correlation matrices for domestic corporate bond markets are provided in [Annex 1.3](#). The results of the correlation analysis confirm that a confluence of different factors is associated with domestic and international corporate bond market size and growth over the last decade.

Corporate bond market size

A raw measure of corporate bond market size can be derived from the total outstanding amount of corporate bonds. For domestic corporate bond markets, the Kendall Tau test indicates a statistically significant and positive correlation between domestic corporate bond market size in a country and:

- Size of domestic banking sector (0.73 ± 0.17 ; $P < 0.01$)¹⁵⁵
- Size of Foreign Direct Investment (0.64 ± 0.16 ; $P < 0.01$)
- The size of the real economy (GDP) (0.61 ± 0.16 ; $P < 0.01$)
- Equity Market size (0.59 ± 0.17 ; $P < 0.01$)
- Government bond market size (0.50 ± 0.17 ; $P < 0.01$)
- Number of Listed companies (0.47 ± 0.18 ; $P < 0.01$);
- International corporate bond market size (0.47 ± 0.16 ; $P < 0.01$);
- Importance of domestic banking sector (0.32 ± 0.17 ; $P < 0.01$)
- Extent of Business Disclosure (0.31 ± 0.17 ; $P < 0.01$)
- Growth of domestic banking sector (0.19 ± 0.17 ; $P < 0.05$)
- Growth of Equity Markets (0.20 ± 0.18 ; $P < 0.05$)

A significant and negative correlation between domestic corporate Bond Market Size in a country and:

- Country risk premium (-0.23 ± 0.17 ; $P < 0.1$); GDP

For international corporate bond markets, a different set of correlations were recorded. The Kendall Tau test indicates a statistically significant and positive correlation between international corporate bond market size in a country and:

¹⁵⁵ First figure is correlation coefficient, second figure is standard error, P figure indicates level of significance.

- Size of domestic banking sector (0.51±0.17; P<0.01)
- Equity Market Size (0.48±0.17; P<0.01)
- Foreign Direct Investment (0.47±0.16; P<0.01)
- The size of the real economy (GDP) (0.40±0.16; P<0.01)
- Government Bond market size (0.33±0.17; P<0.01)
- Importance of domestic banking sector (0.24±0.17; P<0.01)
- Government effectiveness (0.25±0.16; P<0.01)
- Number of listed domestic companies (0.20±0.18; P<0.01)
- GDP per capita (0.19±0.17; P<0.01)
- Rule of Law (0.18±0.16; P<0.01)

A significant and negative correlation between international corporate bond market size in a country and:

- Country Risk Premium (-0.26±0.17; P<0.01)
- Consumer Price Index (-0.17±0.17; P<0.01)

Corporate bond market importance to the economy

The importance of corporate bond markets to an economy can be broadly indicated by the level of corporate bond outstanding as a percentage of GDP. This indicator is also an additional 'size' indicator which takes into account the size of corporate bond outstanding relative to the overall size of the economy.

The Kendall Tau test indicates a statistically significant and positive correlation between domestic corporate bond market importance in a country and:

- Domestic corporate bond market size (0.87±0.16; P<0.01)
- Size of domestic banking sector (0.65±0.17; P<0.01)
- Foreign Direct Investment (0.54±0.17; P<0.01)
- Equity market size (0.46±0.17; P<0.01)
- International corporate bond market size (0.41±0.16; P<0.01)
- Domestic corporate bond market growth (0.40±0.16; P<0.01)
- Government bond market size (0.40±0.17; P<0.01)
- Importance of domestic banking sector (0.40±0.17; P<0.01)
- No of listed companies (0.38±0.18; P<0.01)
- Extent of Business Disclosure (0.27±0.17; P<0.01)
- Government effectiveness (0.22±0.16; P<0.01)
- GDP (0.50±0.16; P<0.01)

A significant and negative correlation between domestic corporate bond market importance in a country and:

- Country Risk Premium (-0.25±0.17; P<0.01)
- Difficulty of doing business (-0.21±0.17; P<0.05)
- Consumer Price Index (-0.21±0.17; P<0.05)

The Kendall Tau test indicates a statistically significant and positive correlation between international corporate bond market importance in a country and:

- Size of international corporate bond markets (0.47±0.16; P<0.01)
- Importance of Foreign Direct Investment in an economy (0.22±0.16; P<0.01)
- GDP per capita (0.30±0.17; P<0.01)
- Control of corruption (0.29±0.16; P<0.01)
- Political Stability (0.21±0.16; P<0.05)
- Government effectiveness (0.36±0.16; P<0.01)
- Rule of Law (0.31±0.16; P<0.01)
- Consumer Price Index (0.20±0.16; P<0.05)

A significant and negative correlation between international corporate bond market importance in a country and:

- Number of listed companies (-0.24±0.18; P<0.05)
- Difficulty of Doing Business (-0.22±0.17; P<0.05)
- Growth in GDP per capita (-0.21±0.17; P<0.01)
- Financial Inclusion growth (-0.20±0.17; P<0.05)
- Country Risk Premium (-0.20±0.17; P<0.05)
- GDP Growth (-0.17±0.16; P<0.05)

Corporate bond market growth in size

Corporate bond market growth has been calculated as the CAGR for the period 2004-2013 (where data allows). Growth is an important characteristic of corporate bond market development. While corporate bond markets may be small (in terms of size or importance to the economy) for some jurisdictions, they may be experiencing relatively high growth rates compared to some larger markets.

The Kendall Tau test indicates a statistically significant and positive correlation between domestic corporate bond market growth in a country and:

- Size of domestic banking sector (0.39±0.17; P<0.01)
- Growth of domestic banking sector (0.19 ±0.17; P<0.05)
- Domestic corporate bond market size (0.44±0.16; P<0.01)
- Government bond market size (0.31±0.17; P<0.01)
- Importance of domestic banking sector (0.29±0.17; P<0.01)
- Government bond market growth (0.20±0.17; P<0.05)
- Growth of domestic banking sector (0.19 ±0.17; P<0.05)
- Government bond market importance (0.18±0.17; P<0.05)
- Equity market size (0.37±0.17; P<0.01)
- Equity market growth (0.19±0.18; P< 0.05)
- Foreign Direct Investment size (0.64±0.16; P<0.01)
- International corporate bond market size (0.47±0.16; P<0.01)
- Extent of Business Disclosure (0.20±0.17; P<0.05)
- Number of listed companies (0.32±0.18; P<0.01)
- GDP (0.37±0.16; P<0.01)

The Kendall Tau test indicates a statistically significant and positive correlation between international corporate bond market growth in a country and:

- Equity market growth (0.19±0.18; P<0.05)

Annex 1.1: Kendall Tau Explanation

The Kendall tau correlation coefficient is calculated using the following formula:

$$\tau = \frac{C - D}{C(n, 2)}$$

Where C is the number of concordant pairs and D is the number of discordant pairs. Concordant and discordant pairs are calculated in a sample with two variables: x (x_1, \dots, x_n) and variable y (y_1, \dots, y_n).

Here, if two distinct pairs of variables are selected from the sample they will be classified as concordant if:

$$(x_a > x_b \text{ and } y_a > y_b) \text{ or } (x_a < x_b \text{ and } y_a < y_b)$$

They will be classified as discordant if:

$$(x_a > x_b \text{ and } y_a < y_b) \text{ or } (x_a < x_b \text{ and } y_a > y_b)$$

They will be classified as neither if:

$$(x_a = x_b \text{ and } y_a = y_b)$$

There are $C(n, 2)$ possible ways of choosing two distinct pairs of (x_a, y_a) and (x_b, y_b) .

The purpose of using the Kendall tau is to test the following hypothesis for the corporate bond market development indicators and the listed variables:

H_0 : No relationship between the variables

H_A : Relationship between the variables

Annex 1.2: Summary statistics - Correlations

	Dom corp bond growth	Dom corp bond size	Int corp bond growth	Int corp bond size	Dom corp bond growth	Dom bond size %gdp	Int bond size %gdp growth	Int corp bond size %gdp	Equity size %gdp
Mean	0.015	54.787	0.055	10.149	-0.015	0.078	-0.026	0.252	0.474
Median	0.000	0.392	0.137	2.438	0.000	0.004	0.022	0.041	0.335
Minimum	-1.000	0.000	-1.000	0.000	-1.000	0.000	-1.000	0.000	0.005
Maximum	0.911	1768.240	0.650	121.508	0.676	0.791	0.446	11.604	2.054
Std. Dev.	0.296	232.091	0.364	19.753	0.210	0.161	0.308	1.396	0.393
C.V.	20.041	4.236	6.676	1.946	13.944	2.062	12.040	5.543	0.829
Skewness Ex.	-1.814	6.302	-1.992	3.505	-2.425	2.797	-2.205	7.971	1.568
kurtosis	6.771	42.150	3.592	14.309	13.651	7.514	4.789	62.289	3.226
5% Perc.	-1.000	0.000	-1.000	0.031	-0.265	0.000	-1.000	0.001	0.030
95% Perc.	0.268	339.446	0.456	58.078	0.158	0.542	0.305	0.338	1.196
IQ range	0.132	11.849	0.222	9.933	0.022	0.086	0.180	0.101	0.538
Missing obs.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	13.000
	Gov bond growth	Gov bond size	Gov bond growth	Gov bond size %gdp	Equity growth	Equity size	Equity size %gdp growth	Ease of Doing Business Growth	Ease of Doing Business Size
Mean	0.214	16.106	0.114	16.106	0.077	18560.600	-0.002	0.001	76.631
Median	0.175	4.555	0.090	4.555	0.075	2863.820	0.001	0.024	73.000
Minimum	-0.099	0.011	-0.159	0.011	-0.093	14.165	-0.149	-0.320	6.500
Maximum	0.759	356.203	0.695	356.203	0.630	334211.000	0.454	0.167	180.500
Std. Dev.	0.230	46.709	0.196	46.709	0.109	47804.700	0.089	0.088	39.893
C.V.	1.071	2.900	1.723	2.900	1.423	2.576	47.283	68.174	0.521
Skewness Ex.	0.696	6.359	0.738	6.359	2.173	5.095	2.352	-1.517	0.267
kurtosis	-0.356	43.200	0.036	43.200	9.382	29.683	10.847	2.849	-0.614
5% Perc.	-0.094	0.137	-0.154	0.137	-0.078	172.095	-0.125	-0.199	18.200
95% Perc.	0.722	70.868	0.461	70.868	0.247	97778.000	0.110	0.105	146.100
IQ range	0.340	12.877	0.265	12.877	0.125	13332.300	0.092	0.067	61.000
Missing obs.	6.000	6.000	5.000	6.000	10.000	8.000	15.000	8.000	8.000
	Extent of Business Disclosure Growth	Extend of Business Disclosure	Marginal Corporate Tax Rate Growth	Marginal Corporate Tax Rate	FDI growth	FDI	FDI size %gdp growth	FDI size %gdp	GDP per capita growth
Mean	0.014	5.573	-0.015	0.237	0.140	64.667	0.032	0.751	0.071
Median	0.000	5.444	0.000	0.250	0.129	28.481	0.031	0.567	0.071
Minimum	0.000	1.000	-0.134	0.000	0.018	0.369	-0.181	0.074	-0.010
Maximum	0.196	10.000	0.046	0.550	0.485	507.767	0.296	7.033	0.173
Std. Dev.	0.031	2.456	0.030	0.093	0.077	97.005	0.074	0.884	0.041
C.V.	2.236	0.441	2.035	0.391	0.552	1.500	2.355	1.176	0.586
Skewness Ex.	3.651	0.056	-1.926	-0.224	1.600	2.933	0.714	5.431	0.121
kurtosis	16.444	-0.918	5.828	1.707	4.529	9.036	2.166	35.805	-0.313
5% Perc.	0.000	2.000	-0.068	0.030	0.044	2.246	-0.067	0.149	0.000
95% Perc.	0.075	10.000	0.023	0.350	0.276	334.673	0.189	1.664	0.145
IQ range	0.015	4.222	0.028	0.106	0.094	66.326	0.094	0.571	0.059

Missing obs.	4.000	4.000	4.000	4.000	2.000	1.000	1.000	1.000	7.000
	GDP per capita	No listed companies growth	No listed companies	Fin Incl growth	Fin Incl	Control of Corrup	Control of Corrup growth	Pol stab	Pol stab growth
Mean	10497.500	-0.004	383.297	0.704	19.636	-0.016	-0.015	-0.138	-0.152
Median	7505.620	0.000	132.900	0.123	15.779	-0.150	-0.031	-0.055	-0.064
Minimum	280.603	-0.327	7.333	-0.571	1.201	-1.096	-2.711	-2.375	-13.623
Maximum	72406.400	0.282	4953.300	13.176	112.803	1.433	2.909	1.196	5.693
Std. Dev.	11298.800	0.074	765.645	2.324	18.079	0.697	0.786	0.857	1.963
C.V.	1.076	20.594	1.998	3.302	0.921	42.517	51.819	6.194	12.929
Skewness Ex.	3.173	-0.524	4.334	4.841	2.940	0.414	0.251	-0.394	-4.394
kurtosis	13.515	8.753	21.702	22.721	11.520	-0.740	4.337	-0.687	31.995
5% Perc.	1147.670	-0.117	12.060	-0.225	2.906	-1.048	-1.326	-1.645	-1.852
95% Perc.	27163.500	0.091	1851.100	3.154	42.831	1.336	1.343	1.043	1.839
IQ range	9400.060	0.033	337.200	0.429	17.984	1.007	0.504	1.486	0.598
Missing obs.	7.000	14.000	14.000	7.000	6.000	1.000	1.000	1.000	1.000
	Gov effectiveness	Gov effectiveness growth	Reg qual	Reg qual growth	Rule of law	Rule of law growth	Credit risk premium	GDP	GDP growth
Mean	0.175	8.325	0.194	-0.024	0.002	-0.052	0.044	160.302	0.105
Median	0.117	-0.017	0.286	-0.034	-0.067	-0.022	0.029	53.378	0.099
Minimum	-1.298	-4.885	-1.581	-13.966	-1.536	-12.546	0.008	0.692	0.013
Maximum	1.394	563.637	1.476	3.773	1.434	12.155	0.150	2173.220	0.243
Std. Dev.	0.674	68.358	0.729	1.894	0.740	2.219	0.037	317.588	0.051
C.V.	3.855	8.211	3.756	79.607	370.156	42.813	0.841	1.981	0.484
Skewness Ex.	0.024	8.059	-0.412	-5.727	0.077	-0.223	1.350	4.281	0.494
kurtosis	-0.904	62.971	-0.328	41.920	-1.139	26.157	0.897	22.201	-0.102
5% Perc.	-0.955	-0.811	-1.338	-0.477	-1.095	-1.454	0.008	4.832	0.024
95% Perc.	1.244	3.289	1.312	2.317	1.118	1.131	0.128	792.402	0.205
IQ range	1.063	0.435	1.062	0.539	1.328	0.433	0.043	131.921	0.071
Missing obs.	1.000	1.000	1.000	1.000	1.000	1.000	4.000	0.000	0.000
	CPI	CPI growth	Credit priv sector	Credit priv sector growth	Credit priv sector % GDP	Credit priv sector % GDP growth			
Mean	6.162	-0.018							
Median	4.866	-0.016							
Minimum	1.409	-0.211							
Maximum	24.594	0.363							
Std. Dev.	4.114	0.090							
C.V.	0.668	5.027							
Skewness Ex.	1.941	1.142							
kurtosis	5.475	4.228							
5% Perc.	2.113	-0.168							
95% Perc.	12.169	0.111							
IQ range	5.493	0.095							
Missing obs.	3.000	8.000							

Annex 1.3: Kendall Tau Matrices

Domestic Corporate Bond Markets

	Dom Corp Bond Market Size	Dom Corp Bond Market Growth	Gov Bond Market Size	Gov Bond Market Growth	Gov Bond Market Impor	Gov Bond Market Impor Growth	Equity Market Size
[1] <i>Dom Corp Bond Market Size</i>			0.496***		0.496***		0.585***
[2] <i>Dom Corp Bond Market Growth</i>	0.438***		0.311***	0.202**	0.311***	0.184**	0.370***
[3] <i>Dom Corp Bond Market Size (% GDP)</i>	0.873***	0.396***	0.397***				0.457***
[4] <i>Dom Corp Bond Market Growth (% GDP)</i>	0.198**	0.640***	0.201**	0.187**		0.198**	0.233**
	Equity Market Growth	Equity Market Impor	Equity Market Import Growth	FDI Size	Int Corp Bond Market Size	Ease of Doing Business	Extent of Business Discl.
[1] <i>Dom Corp Bond Market Size</i>	0.194**			0.640***	0.472***		0.305***
[2] <i>Dom Corp Bond Market Growth</i>	0.267***			0.460***	0.227***		0.195**
[3] <i>Dom Corp Bond Market Size (% GDP)</i>				0.542***	0.410***	(-)0.212**	0.271***
[4] <i>Dom Corp Bond Market Growth (% GDP)</i>	0.208**	0.217**	0.206**	0.235***			
	No. Listed Domestic Companies	Political Stability Growth	Gov Effect	Rule of Law Growth	Country Credit Risk Premium	GDP	CPI
[1] <i>Dom Corp Bond Market Size</i>	0.462***					0.614***	
[2] <i>Dom Corp Bond Market Growth</i>	0.315***					0.366***	
[3] <i>Dom Corp Bond Market Size (% GDP)</i>	0.376***		0.222**		(-)0.250***	0.495***	(-)0.214**
[4] <i>Dom Corp Bond Market Growth (% GDP)</i>	0.209**	0.226***		(-)0.183**			
	Dom credit to priv sector	Dom credit to priv sector growth	Dom Credit to priv sector import	Dom credit to priv sector impor growth			
[1] <i>Dom Corp Bond Market Size</i>	0.732***	0.203**	0.323***	0.203**			
[2] <i>Dom Corp Bond Market Growth</i>	0.393***	0.195**	0.290***	0.194**			
[3] <i>Dom Corp Bond Market Size (% GDP)</i>	0.647***	0.166*	0.396***	0.166*			

[4] <i>Dom CorpBond Market Growth (% GDP)</i>	0.346***	0.250***	0.207**	0.250***
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Note: Only correlations significant at the P>0.01 and P>0.05 are shown.

International Corporate Bond Markets

	International Corporate Bond Market Size	International Corporate Bond Market Growth	Foreign Direct Investment Size	Foreign Direct Investment Size (% GDP)	Government Bond Market Size	Government Bond Market Size (% GDP)
[1] International Corporate Bond Market Size			0.471***		0.332***	0.332***
[2] International Corporate Bond Market Growth						
[3] International Corporate Bond Market Size (% GDP)	0.470***			0.216***		
[4] International Corporate Bond Market Growth (% GDP)		0.763***				
	Equity Market Size	Equity Market Growth	Equity Market Growth (% GDP)	Ease of Doing Business	GDP per capita	GDP per capita growth
[1] International Corporate Bond Market Size	0.483***				0.185**	
[2] International Corporate Bond Market Growth		0.192**	0.189**			
[3] International Corporate Bond Market Size (% GDP)				(-)0.216**	0.301***	(-)0.208**
[4] International Corporate Bond Market Growth (% GDP)						
	No. Listed Domestic Companies	Financial Inclusion Growth	Control of Corruption	Political Stability	Government Effectiveness	Rule of Law
[1] International Corporate Bond Market Size	0.203**				0.245***	0.180**
[2] International Corporate Bond Market Growth						
[3] International Corporate Bond Market Size (% GDP)	(-)0.243***	(-)0.199**	0.288***	0.213**	0.364***	0.310***
[4] International Corporate Bond Market Growth						

	(% GDP)	Country Credit Risk Premium	GDP	GDP Growth	Consumer Price Index
[1]	International Corporate Bond Market Size	(-)0.261***	0.399***		(-)0.173**
[2]	International Corporate Bond Market Growth				
[3]	International Corporate Bond Market Size (% GDP)	(-)0.196**		(-)0.168**	(-)0.202**
[4]	International Corporate Bond Market Growth (% GDP)				

Note: Only correlations significant at the P>0.01 and P>0.05 are shown.

Technical Appendix 2 – Fixed Effects Regression Using Panel Data

Research methodology

This study involves a fixed effects regression using panel data. Panel data combines cross-sectional and time series data. The fixed effects method can help provide an empirical basis for suggesting causal relationships. Firebaugh, Warner, Massgolia explain “*Fixed effects models provide a way to estimate causal effects in analyses where units.... are measured repeatedly over time. The beauty of the fixed effects method is that it can eliminate the effects of confounding variables without measuring them or even knowing exactly what they are, as long as they are stable over time.*”¹⁵⁶

This study is based on a panel database with 62 cross-sectional units (countries – see [Annex A](#) for list) and 10 time periods (2004-2013). In total, the dataset has 13, 365 observations however the panel is unbalanced with 275 missing values. A description of the data is presented in [Annex 2.1](#). Data has been gathered from a number of different sources to populate the panel.

(a) Variables

The selection of independent and dependent variables for investigation has come from three sources. Firstly, a review of the literature was performed to narrow down potential variables which may have determinant qualities for corporate bond market development, specifically in emerging markets. Secondly, a correlation analysis was performed on these variables using Kendall Tau’s non-parametric rank correlation. Results are presented in [Technical Appendix 1](#).

Based on these two methods, a list of variables was refined. An ‘institutional quality’ composite indicator was created from the averages of the scores for ‘rule of law’, ‘regulatory quality’ and ‘government effectiveness’. Political stability and control of corruption were dropped since this effect is captured under the country risk premium indicator. Equity Market size showed high correlation with banking sector size, GDP and FDI and was dropped in favour of using number of listed domestic companies. The Ease of doing business indicator also had to be excluded due to lack of time series data. Lastly the marginal corporate tax rate was dropped since there was little correlation between this variable and any indicator of corporate bond market development under investigation. Two additional dependant variables were added to the analysis, domestic corporate bond market activity and international corporate bond market activity. Furthermore, for comparison purposes, total corporate bond market size, depth and activity were included in the regression analysis.

Using these variables, a correlation matrix was produced to check for multi-collinearity. The initial correlation matrix showed high correlation (>0.7) between GDP, bank sector size, FDI size and government bond market size. To overcome this issue, the base set of indicators were refined further in the context of current theoretical understandings about the relationship between financial, economic and institutional factors and corporate bond market development.

¹⁵⁶ Glenn Firebaugh, Cody Warner, Michael Massoglia, “Fixed Effects, Random Effects, and Hybrid Models for Causal Analysis”, *Handbook of Causal Analysis for Social Research*, March 2013

The dependant variables used are domestic corporate bond market size, depth and activity; international corporate bond market size, depth and activity; and total corporate bond market size, depth and activity.

It is worth noting that international corporate bond market size, depth and activity may be positively related to domestic corporate bond market size. As international corporate bond markets develop, even if a domestic investor base is lacking, the infrastructure needed to support domestic corporate bond markets may increase, as may the level of comfort for firms in finding financing through fixed income markets. Since the characteristics of international vs domestic bond issuances differ, evidence suggests that domestic and international bond markets may act as complements as opposed to substitutes.¹⁵⁷ However, both international and domestic corporate bond market size show high correlation with other independent variables and have thus been eliminated from the model.

The importance of having a large government bond market on the development of corporate bond markets has been extensively discussed in the literature. On one hand, a large government bond market can facilitate corporate bond market development by providing a benchmark yield curve, mobilizing an investor base, introducing familiarity with the bond market, increasing information exchange on prospective bond issuers, and providing a hedging tool for interest rate risk.¹⁵⁸ On the other hand, a large government bond market can act to crowd out investment in the corporate bond market, especially if government bonds experience preferential tax treatment.¹⁵⁹ In this case, the relationship could be negative or positive or cancelled out. Government bond market size is used as an independent variable in the regression.

While equity and bond markets are very different in terms of their structure, the types of contracts involved and the reasons for both issuing and investing in these markets, a well-developed equity market usually goes hand in hand with a well-developed corporate bond market. One of the differences between equity and bond markets is the need for reliable financial infrastructures. Equity markets can generally pop up even in countries where financial infrastructure is lacking and rule of law is weak, unlike bond markets.¹⁶⁰

In turn, equity markets can assist in mobilizing an institutional investor base and a borrowing class, increasing demand for more robust financial market infrastructure - needed for supporting corporate bond market development.¹⁶¹ As such equity market development should be positively correlated with corporate bond market development. On the other hand, equity and debt markets can often act as substitutes. While equity often constitutes a cheaper source of capital than corporate bonds, conditions such as interest rates can affect the cost-trade-offs making corporate debt more appealing. Furthermore, issuing corporate bonds provides a source of financing without giving up equity in a firm, making it an attractive alternative. As such the relationship between these two variables could be positive and negative. In the regression analysis, the number of listed domestic firms is used as an independent variable to capture this effect.

¹⁵⁷ Juan Carlos Gozzi, Ross Levine, Maria Soledad Martinez Peria, Sergio L. Schmukler, "How Firms Use Domestic and International Corporate Bond Markets", *NBER Working Paper*, January 2012

¹⁵⁸ World Bank IMF, "Developing Government Bond Markets: A Handbook", July 2001; Borenstein, Cowan, Eichengreen, Panizza, "On the Verge of a Big Ban? Bond Markets in Latin America, Cambridge, MIT Press, 2008

¹⁵⁹ Barry Herman, Jose Antonio Ocampo, Shari Spiegel (eds) "Overcoming Developing Country Debt Crises", Oxford University Press, 2010

¹⁶⁰ Luc Laeven, "The Development of Local Capital Markets: Rational and Challenges", IMF Working Papers, 2014

¹⁶¹ *ibid*

Firms wanting to issue bonds rely on investment banks for expertise in designing the issue, underwriting services, finding buyers, providing liquidity and acting as guarantors. At the same time, growing corporate debt markets could act as a substitute for traditional banking.¹⁶² As such, having a robust banking sector could prove to be an important element in developing an active corporate bond markets, but the relationship could be either positive or negative. A robust banking sector can be measured by the size of bank assets as a percentage of GDP, the ratio of non-performing loans to total loans and the bank spread. These variables are added to the regression model.

Two other measures of both equity market size and the size of the banking sector are total market capitalization and the size of credit to the private sector. Both these indicators are highly correlated making it difficult to explore these potential determinants individually in the model. Instead, a composite indicator has been developed as the sum of market capitalization as a percentage of GDP and credit to the private sector as a percentage of GDP. This indicator provides insight into the depth of the financial sector in an economy. Equity and banking sectors traditionally develop before corporate bond markets in an economy and as such the size and depth of the financial sector should be positively related with corporate bond market development.

Foreign Direct Investment (FDI) occurs when an investor acquires ownership interest in an enterprise in a foreign country. The importance of Foreign Direct Investment in an economy, the FDI stock as a percentage of GDP, can signify the openness of an economy. In addition, FDI can be a useful financing channel for emerging markets, filling current account deficits, providing financing where domestic sources are scarce and facilitating the transfer of the technology, skills and information necessary for capital markets to grow into players on the global stage.¹⁶³ As such, as FDI becomes more important in an economy, we expect corporate bond market development to increase, particularly international corporate bond market size.

Robust institutions can explain differences in levels of economic development and behaviour in an economy.¹⁶⁴ Likewise, institutional quality, measured here as government effectiveness, regulatory quality and rule of law, is recognized as an important bedrock in the development of financial markets.¹⁶⁵ Such infrastructure reduces uncertainty around financial market transactions, contract enforcement, corruption and transparency, facilitating sound capital transformation. Strong institutional quality should have a positive relationship with corporate bond market development.

The level of economic development, measured as the Gross Domestic Product (GDP), is a well-established determinant of financial market development. A high level of economic growth and development is usually associated with strong infrastructure, a large issuer and investor base and attractiveness as an investment destination on the global stage – all factors that can contribute to growth in corporate bond markets.¹⁶⁶ However, since GDP is highly correlated with other independent variables under analysis, GDP per capita has been used. While we would expect to see a positive relationship between the level of economic development and

¹⁶² John Hawkins, "Bond Markets and banks in emerging economies", BIS Paper no 11, The development of bond markets in emerging economies, June-July, pp. 42-48, 2002

¹⁶³ Libor Krkoska, "Foreign direct investment financing of capital formation in central and eastern Europe", Working paper, European Bank for Reconstruction and Development, 2001.

¹⁶⁴ Rodrik, D. (2007). *One economics, many recipes: globalization, institutions and economic growth* Princeton, Princeton University Press.; Shirley, M. M. (2005). *Institutions and Development*. Handbook of New Institutional Economics. C. Ménard and M. S. (eds). Dordrecht, Springer.

¹⁶⁵ World Bank, "Institutional Foundations for financial markets", Financial Sector Indicators Note: 5, 2006;

¹⁶⁶ See IOSCO, "The Development of Corporate Bond Markets in Emerging Market Countries", May 2002

corporate bond market development, smaller economies with a lower level of economic development tend to experience more and faster growth in GDP per capita than larger (in terms of GDP) markets. As such, while we would expect those economies with a high level of economic development to have larger corporate bond markets, the relationship between these two indicators may be negative due to the nature of the regression.

The Consumer Price Index (CPI) is an indicator of inflation. A rapidly increasing CPI suggests rapid inflation and can have an impact on bond prices. Essentially, a high rate of inflation will lead to a higher rise in yield of new issuances to compensate for inflation risk. This will reduce the value of previously issued bonds. Furthermore, volatility in the CPI can hint at instability in macroeconomic factors, reducing confidence in financial markets, including bond markets. As such, we expect to see a negative relationship between CPI and corporate bond market development. However, since this indicator is primarily a demand-indicator and such considerations are usually only taken into account by experienced bond investors, the effect may be marginal in emerging markets with relatively smaller corporate bond markets. Furthermore, in the literature it is the perception of inflation which is cited as having an impact on bond returns rather than actual inflation, which may reduce the predictive power of this indicator for corporate bond market size and depth (which are cumulative indicators), but still be relevant for corporate bond market activity.

Another variable affecting the risks (and yields) associated with corporate bonds is the country risk premium. This premium refers to the perception of country specific factors which could exacerbate risks of investing in the financial instruments originating in said country. These risks could include political risks, exchange rate risk and sovereign risk.

The predictive power of the CPI and country risk premium individually on corporate bond market development may be small and can have both positive and negative impacts on corporate bond market development, particularly corporate bond market activity. For example while increasing CPIs and country risk premiums suggest more risk in investing in emerging market bonds of those countries, it can also result in higher yields making investment more attractive for both domestic and foreign investors. However, for those economies facing both high inflation and with high country risk premiums the negative impact on corporate bond market development may be more pronounced. As such, the indicator CPI*Country Risk has been created to account for this context.

A further description of the dependent and independent variables, including data sources is given in [Annex 2.2](#).

(b) Correlation matrix and summary statistics

Both dependent and independent variables were put in the standardized form. A correlation matrix was generated which showed relatively low correlations amongst the independent variables suggesting low chance of severe multi-collinearity problems in the model. Summary statistics are provided in Annex 2.1.

(c) Selection of regression model

In order to select the correct model for running a multiple regression, firstly a pooled OLS model¹⁶⁷ was generated for each model under investigation. Next a Breusch-Pagan test was

¹⁶⁷ With robust standard errors to account for heteroskedasticity in the error terms.

applied to each model to test the adequacy of the pooled OLS model. For each model the null hypothesis of adequacy was rejected in favor of the random effects model.

Next, the Hausman test was conducted to choose between the random or fixed effects regression technique. In each case, the null hypothesis that the random effects model is consistent was rejected, in favor of the fixed effects model. Lastly, the fixed effects model was used for each model under investigation, using robust error correction, to account for any heteroscedasticity in the error terms.

The basic regression model is as follows:

$$y_{it} = \beta X_{it} + \alpha_i + \epsilon_{it} \quad i = 1, \dots, 62; t = 1, \dots, 10$$

Where i is the cross-sectional dimension and t is the time dimension. y_{it} is the dependent variable across the time and cross-sectional dimension. β is a vector of the coefficients. The error term ϵ_{it} is different for each cross-sectional unit at each point in time and the error term α_i varies across cross-sectional units but not across time.

(a) Results

The models were run through the Gretl statistical package using the fixed effects panel model command with robust standard errors (Arellano) and produced the following output:

Table 4: Fixed Effects Regression Estimates

Dep. Var.	Dom corp size	Int corp size	Tot corp size	Dom corp depth	Int corp depth	Tot corp depth	Dom corp activ.	Int corp activ.	Tot corp activ.
const	0.08772** (0.03506)	0.1960** (0.06883)	0.09985** (0.03253)	0.4487** (0.06492)	-0.1824** (0.02677)	0.2905** (0.05894)	0.03968 (0.04354)	0.3094** (0.1205)	0.09296* (0.05152)
FDI Impor.	0.07844 (0.06602)	-0.05098 (0.1207)	0.07166 (0.06754)	-0.03795 (0.1205)	0.8078* (0.4185)	0.3565 (0.2602)	0.3187 (0.2124)	0.2550 (0.1983)	0.3251 (0.2055)
Gov bond mkt Size	0.6670** (0.01943)	0.1375 (0.1104)	0.6538** (0.01210)	0.02773 (0.02184)	0.01187 (0.01414)	0.02909 (0.01947)	1.014** (0.05321)	0.5448** (0.09746)	1.006** (0.03148)
GDP per capita	0.05839 (0.08311)	0.7473** (0.2735)	0.1145 (0.08168)	0.6117** (0.2835)	-0.2745 (0.2500)	0.3837 (0.2962)	-0.06344 (0.1214)	1.111** (0.3868)	0.1595 (0.1394)
Instit. qual	0.2800 (0.1822)	0.5451* (0.3231)	0.3125* (0.1786)	-0.1732 (0.2631)	0.2720 (0.1897)	-0.01524 (0.2343)	0.02961 (0.2613)	0.3540 (0.4430)	0.1117 (0.2336)
No. listed comp.	0.1457** (0.05153)	0.3362** (0.07381)	0.1667** (0.05053)	0.01390 (0.05135)	0.08437** (0.03950)	0.05230 (0.03588)	0.1331 (0.1462)	0.4060** (0.08524)	0.1988 (0.1378)
Bank spread	-0.1987 (0.1263)	-0.7652** (0.1956)	-0.2512* (0.1314)	0.02629 (0.1079)	-0.2524* (0.1521)	-0.09925 (0.08164)	0.2076** (0.09049)	-0.8835** (0.2018)	0.006599 (0.06733)
Non perf. loans	-0.003971 (0.03422)	0.04257 (0.02711)	-0.0005118 (0.03278)	-0.01195 (0.03558)	0.08098** (0.03942)	0.02888 (0.03564)	0.01961 (0.01958)	0.09824 (0.08243)	0.03363* (0.01931)
Fin sec depth	-0.03139 (0.02095)	-0.08704* (0.05155)	-0.03705* (0.02007)	0.2572** (0.06867)	-0.06366 (0.05935)	0.1862** (0.07189)	-0.1901 (0.1575)	-0.1077 (0.1096)	-0.1888 (0.1549)
Bank impor	0.09652** (0.03664)	0.1840 (0.1616)	0.1074** (0.03090)	0.02737 (0.1030)	0.008733 (0.04689)	0.02728 (0.08945)	0.08094 (0.08831)	-0.4212 (0.2808)	-0.01039 (0.03555)
Country risk*CPI	-0.02693* (0.01613)	-0.04351 (0.04359)	-0.02935* (0.01691)	0.001031 (0.03157)	0.01952 (0.01879)	0.01026 (0.03024)	-0.04533 (0.03212)	-0.1267** (0.05681)	-0.06421* (0.03603)
n	271	271	271	271	271	271	265	271	271
R2	0.9698	0.8613	0.9710	0.9435	0.7522	0.9352	0.9140	0.8289	0.9270
lnL	-10.2	-178.7	-2.736	-64.48	-50.53	-58.84	-152.2	-232.7	-130.5
SE of Reg.	0.272733	0.507876	0.265319	0.333210	0.316486	0.326349	0.467480	0.619886	0.425058

Note: Standard errors in parentheses * indicates significance at the 10 percent level ** indicates significance at the 5 percent level

The evidence obtained from the study suggests that for domestic corporate bond market size, the coefficients of government bond market size, number of listed domestic companies, Country Risk Premium multiplied by CPI and the importance of bank credit in the economy are significant. Domestic corporate bond market size increases between 0.63 and 0.71 standard deviations for a 1 standard deviation increase in government bond market size; between 0.05 and 0.25 standard deviations for a 1 standard deviation increase in the number of listed companies; between 0.24 and 0.17 standard deviations for a 1 standard deviation increase in the importance of the banking sector in the real economy; between -0.09 and 1.18 standard deviations for a 1 standard deviation increase in institutional quality; and between 0.06 and 0.00 standard deviations for a 1 standard deviation decrease in CPI*Country Risk indicator.

International corporate bond market size increases between 0.21 and 1.29 standard deviations for a 1 standard deviation increase in GDP per capita; between 0.19 and 0.48 standard deviations for a 1 standard deviation increase in the number of listed companies; between 1.15 and 0.38 standard deviations for a 1 standard deviation decrease in the bank spread; and between 0.19 and 0.00 standard deviations for a 1 standard deviation decrease in the depth of the financial sector.

Total corporate bond market size increases between 0.63 and 0.68 standard deviations for a 1 standard deviation increase in government bond market size; between -0.04 and 0.66 standard deviations for a 1 standard deviation increase in institutional quality; between 0.07 and 0.27 standard deviations for a 1 standard deviation increase in the number of listed companies; between -0.51 and 0.01 standard deviations for every 1 standard deviation increase in the bank spread; between -0.08 and 0.00 standard deviations for every 1 standard deviation in financial sector depth; between 0.05 and 0.17 standard deviations for every 1 standard deviation increase in the depth/importance of the banking sector in the economy; and between 0.06 and 0.00 standard deviation for a 1 standard deviation decrease in the CPI*Country Risk indicator.

Domestic corporate bond market depth increases between 0.05 and 1.17 standard deviations for a 1 standard deviation increase in GDP per capita; and between 0.12 and 0.39 standard deviations for a 1 standard deviation increase in the financial sector depth of an economy. International corporate bond market depth increases between -0.02 and 1.63 standard deviations for a 1 standard deviation increase in the importance of Foreign Direct Investment in an economy; between 0.07 and 0.16 standard deviations for a 1 standard deviation increase in the number of listed domestic companies; between -0.55 and 0.05 standard deviations for a 1 standard deviation increase in the bank spread; and between 0.00 and 0.16 standard deviations for a 1 standard deviation increase in the percentage of nonperforming loans. Total corporate bond market depth increases between 0.05 and 0.33 standard deviations for a 1 standard deviation increase in the financial sector depth in an economy.

Domestic corporate bond market activity increases between 0.91 and 1.12 standard deviations for a 1 standard deviation increase in the size of corporate bond markets; and between 0.03 and 0.34 standard deviations for a 1 standard deviation increase in the bank spread. International corporate bond market activity increases between 0.35 and 0.74 standard deviations for a 1 standard deviation increase in government bond market size; between 0.35 and 1.88 standard deviation increase for a 1 standard deviation increase in GDP per capita; between 0.24 and 0.57 standard deviations for a 1 standard deviation increase in the number of listed domestic companies; between 1.28 and 0.49 standard deviations for every 1 standard

deviation decrease in the bank spread; and between 0.24 and 0.02 standard deviations for every 1 standard deviation decrease in the CPI*Country Risk indicator. Lastly, total corporate bond market activity increases between 0.94 and 1.07 standard deviations for a 1 standard deviation increase in the size of government bond markets; between -0.00 and 0.07 standard deviations for a 1 standard deviation increase in the percentage of non-performing loans; and between 0 and 0.14 standard deviations for a 1 standard deviation decrease in the CPI*Country Risk indicator.

Annex 2.1 - Summary Statistics - Regression

Panel Data, Summary Statistics, using the observations 1:01 - 62:10
(missing values were skipped) (non-standardized)

	Dom corp size	Int corp size	Dom corp depth	Int corp depth	Dom corp activity	Int corp activity	FDI impor.	Gov bond size	GDP per capita
Mean	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Median	-0.23	-0.35	-0.46	-0.37	-0.19	-0.36	-0.21	-0.22	-0.30
Minimum	-0.23	-0.46	-0.49	-0.73	-0.19	-0.39	-0.77	-0.28	-0.87
Maximum	10.63	8.35	5.55	6.16	14.53	9.87	8.56	12.41	6.90
Std. Dev.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
IQ range	0.04	0.44	0.46	0.96	0.03	0.31	0.60	0.18	0.91
	Instit. Qual.	No. listed comp.	Non-perf. loans	Bank spread	Bank assets impor	CPI*Count. Risk	Tot corp bond size	Tot corp bond depth	Tot corp bond activity
Mean	0.00	0.00	0.00	0.00	-0.01	0.00	0.00	0.00	0.00
Median	-0.08	-0.32	-0.40	-0.27	-0.09	-0.36	-0.24	-0.35	-0.23
Minimum	-2.87	-0.48	-0.91	-1.77	-2.09	-3.88	-0.26	-0.76	-0.24
Maximum	1.91	6.71	7.49	5.67	3.90	8.52	10.35	5.34	13.81
Std. Dev.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
IQ range	1.49	0.38	0.85	0.66	1.47	0.56	0.08	0.91	0.11
	Finsec depth								
Mean	0.00								
Median	-0.25								
Minimum	-1.30								
Maximum	6.66								
Std. Dev.	1.00								
IQ range	1.02								

Annex A – List of countries

- Argentina
- Bahrain
- Barbados
- Brazil
- Bulgaria
- Chile
- China
- Chinese Taipei
- Columbia
- Costa Rica
- Croatia
- Cyprus
- Czech Republic
- Egypt
- El Salvador
- Estonia
- Ghana
- Hungary
- India
- Indonesia
- Iran
- Israel
- Jamaica
- Kazakhstan
- Kuwait
- Latvia
- Lebanon
- Liberia
- Lithuania
- Malaysia
- Mauritius
- Mexico
- Morocco
- Nigeria
- Oman
- Pakistan
- Panama
- Paraguay
- Peru
- Philippines
- Poland
- Qatar
- Romania
- Russia
- Rwanda
- Saudi Arabia
- Serbia
- Slovakia
- Slovenia
- South Africa
- South Korea
- Sri Lanka
- Thailand
- Trinidad and Tobago
- Tunisia
- Turkey
- Ukraine
- United Arab Emirates
- Uruguay
- Venezuela
- Vietnam

Annex B – Description of data sources

Variable	Description	Source
Domestic corporate bond market size	The size of domestic corporate bond markets globally was synthesized from a number of databases from 2004 to 2013. The data takes the form of total amount outstanding in US\$ billions.	IOSCO research department calculations based on data from BIS, ABO, ECB, Dealogic, IOSCO internal data gathering exercises and local authorities
Domestic corporate bond market depth	The importance of domestic corporate bond markets in an economy, also known as the depth, is calculated by dividing the size of the domestic corporate bond market by the GDP of that country from 2004 to 2013. This data takes the form of a percentage.	IOSCO research department calculations based on data from BIS, ABO, ECB, Dealogic, IOSCO internal data gathering exercises and local authorities GDP based on IMF data.
International corporate bond market size	The size of international corporate bond markets globally was synthesized from a number of databases from 2004 to 2013. The data takes the form of total amount outstanding in US\$ billions.	IOSCO research department calculations based on data from BIS, ABO, ECB, Dealogic, IOSCO internal data gathering exercises and local authorities
International corporate bond market depth	The importance of international corporate bond markets in an economy, also known as the depth, is calculated by dividing the size of the domestic corporate bond market by the GDP of that country from 2004 to 2013. This data takes the form of a percentage.	IOSCO research department calculations based on data from BIS, ABO, ECB, Dealogic, IOSCO internal data gathering exercises and local authorities GDP based on IMF data.
Domestic corporate bond market activity	Activity is measured as total volume of issuance in US\$ bills. Data has been delineated as ‘domestic issuances’ based on the criteria of ‘issued on domestic market’ and not issued on	Dealogic

	'foreign or global markets' and in local currency.	
International corporate bond market activity	Activity is measured as total volume of issuance in US\$ bills. Data has been delineated as 'international issuances' based on the criteria of 'issued on foreign or global markets' or in non-local currency	Dealogic
Size of the Real Economy (GDP)	Calculated as the gross domestic product, US\$ billions.	World Bank/IMF
Gross Domestic Product per capita	Calculated as GDP divided by population.	World Bank/IMF
Size of Government bond markets	Calculated as the total amount of government bonds outstanding, US\$ billions.	Bloomberg
Importance of Government bond markets	Calculated as the total amount of government bonds outstanding, US\$ billions, divided by GDP	Bloomberg, World Bank/IMF
Size of Foreign direct investment (FDI)	Calculated from Foreign Direct Investment stock, inflows, in US\$ billions. FDI refers to an investment made to acquire lasting interest in enterprises operating outside of the economy of the investor. Further, in cases of FDI, the investor's purpose is to gain an effective voice in the management of the enterprise. The larger the FDI into an economy, the more open that economy tends to be.	UNCTAD
Importance of Foreign Direct Investment (FDI)	Calculated from Foreign Direct Investment stock, inflows, in US\$ billions, divided by GDP.	UNCTAD, World Bank/IMF
Banking sector size	Size of banking sector calculated as domestic credit to private sector as a % of GDP, multiplied by GDP. Domestic credit to private sector refers to financial resources provided to the private sector by financial corporations, such as through loans, purchases of nonequity securities, and trade credits and other accounts receivable, that establish a claim for repayment. For some countries these claims include credit to public enterprises. The financial corporations include monetary authorities and deposit money banks, as well as other financial corporations where data are available (including corporations that do not accept transferable deposits but do incur such liabilities as time and savings deposits). Examples of other financial corporations are finance and leasing companies, money lenders, insurance corporations, pension funds, and foreign exchange companies.	World Bank
Equity Market size	Equity market capitalization calculated as market capitalization in US\$ billions. Total market capitalization in an economy represents the total dollar market value of all listed company's outstanding shares and indicates size of equity markets.	World Bank
Financial Sector size	Calculated as size of banking sector plus equity market capitalization.	World Bank
Banking sector depth/importance	Calculated from domestic credit to private sector as a % of GDP.	World Bank

Equity Market depth/importance	Equity market capitalization in US\$ billions as a % of GDP.	World Bank, Bloomberg
Financial Sector Depth/Importance	Calculated from domestic credit to private sector as a % of GDP and equity market capitalization in US\$ billions as a % of GDP.	World Bank, Bloomberg
Institutional Quality index	<p>Created as an average of the following World bank worldwide governance indicators - the higher the ranking the better the score:</p> <p>Government Effectiveness Index Government Effectiveness (GE) captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.</p> <p>Regulatory Quality Index Regulatory Quality captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.</p> <p>Rule of Law Index Rule of Law captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.</p>	World Bank
Business extent of disclosure index	Disclosure index measures the extent to which investors are protected through disclosure of ownership and financial information. The index ranges from 0 to 10, with higher values indicating more disclosure.	World Bank
Marginal Corporate Tax Rate	The amount of tax paid on a company's last dollar of taxable income.	KPMG
Consumer Price Index	CPI is one of the most frequently used statistics for identifying periods of inflation or deflation. This is because large rises in CPI during a short period of time typically denote periods of inflation and large drops in CPI during a short period of time usually mark periods of deflation.	
Country Risk Premium	The additional risk associated with investing in an international company rather than the domestic market. Macroeconomic factors such as political instability, volatile exchange rates and economic turmoil causes investors to be wary of overseas investment opportunities and thus require a premium for investing.	NYU Stern/World Bank
Non Performing Loans	Calculated from bank nonperforming loans to total gross loans are the value of nonperforming loans divided by the total value of the loan portfolio (including nonperforming loans before the deduction of specific loan-loss provisions). The loan amount recorded as nonperforming should be the gross value of the loan as recorded on the balance sheet, not just the amount that is overdue.	World Bank
Bank Assets	Calculated as Bank Assets as a percentage of GDP.	Helgilibrary

importance	<p>Banking assets are everything that a bank owns, including loans, securities, and physical assets such as buildings. Bank assets are typically listed on the left-hand side of a bank's balance sheet. Bank liabilities are what a bank owes, or how bank assets are funded, and are listed on the right-hand side of a bank's balance sheet. Net worth is the difference between assets and liabilities and is called equity.</p>	
Bank spread	<p>The Bank spread is the interest rate spread, which is the interest rate charged by banks on loans to private sector customers minus the interest rate paid by commercial or similar banks for demand, time, or savings deposits. The terms and conditions attached to these rates differ by country, however, limiting their comparability.</p> <p>The bank spread is an indication of the banking sector's profitability. The greater the spread, the more profitable the banking sector is likely to be.</p>	World Bank

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