Corporate Bond Markets: A Global Perspective

Volume 1

April 2014

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, issues in emerging market corporate bond markets, have 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

This report presents the results of an in-depth study into corporate bond markets globally. The body of the report offers fact-based descriptions of notable developments and issues over the last thirteen years and looks forward to identify potential issues for further research. The main data sources underpinning the findings and conclusions in this report are: Dealogic, Bloomberg, Bank of International Settlements, Asian Bonds Online, SIFMA, IMF and the World Bank. Findings can be summarized under the following four key messages:

(1) Over the last decade or so, corporate bond markets have become bigger, more important for the real economy, and increasingly global in nature.

- Corporate bond markets have almost tripled in size since 2000, reaching $49 trillion in 2013. Growth stalled in the wake of this financial crisis as banks began deleveraging their balance sheets. However, the amount outstanding from non-financial firms has continued to expand.
- Market depth (amount outstanding as a percentage of GDP) has been increasing amongst developed and emerging markets, averaging 169% for developed markets and 24% for emerging markets in 2013. Deepening markets can suggest increasing reliance on corporate bond markets to meet the financing needs of an economy.
- Corporate bond financing has increased as a proportion of total global corporate financing (which includes corporate bond financing, bank financing and equity market financing). In 2004, corporate bond financing made up 24% of total financing, increasing to 25% in 2012. Bank lending still dominates, making up 52% of total financing in 2012.
- In 2013, corporate bond issuance, a measure of market activity, reached $3.2 trillion, compared to just $0.9 trillion in 2000. Twenty-seven new economies have recorded corporate bond issuances in the last 13 years, most of these economies are emerging markets. In fact, in 2013, emerging markets made up 30% of global issuances compared to just 5% in 2000.
- Interestingly, puttable bond issuances have soared in emerging markets since the onset of the crisis. In 2013, puttable bond issuances from emerging markets reached $47 billion, making up 5% of emerging market issuances. While offering a cheaper source of financing for corporates they can also lead to uncertainty around future cash flows from the issuer's perspective, especially as yields in the developed world begin to increase.
- Bond issuances offered on international markets have increased, with $1.8 trillion issued from developed markets and $320 billion in emerging markets in 2013. Specialized local issuances are also breaking into the global market e.g. Sukuk (Islamic) issuances. Sukuk issuances in emerging markets reached $24 billion in 2013. In developed markets, issuance in 2013 reached $472 million in 2013, double 2007 levels.

(2) Since the onset of the crisis in particular, corporate bond markets have begun to fill an emerging gap in bank lending and long-term financing and are showing potential for servicing SME financing needs.

- Bank lending is being substituted by corporate bond financing in some developed markets, such as the United States and those in Europe. Growth in loan provision by banks to non-financial firms in the United States and Europe declined markedly after the onset of the crisis. This contrasted with strong growth of corporate bond markets outstanding for non-financial firms.

- Yet in China bank lending to the real economy increased drastically after the onset of the crisis, accumulating $8.5 trillion between 2007 and 2013. Non-financial corporate bond outstanding also grew reaching $0.9 trillion in 2013.
- Bonds issued for financing long-term infrastructure projects have been on the increase since the outbreak of the crisis. Between 2000 and 2013, $171 billion worth of infrastructure bonds were issued. The majority of these issuance have happened post-2007, originating mostly from China.
- Small Medium Enterprises will benefit from further development of corporate bond markets and improved access, especially in emerging markets. Cross-border bank lending, equity flows and foreign direct investment to emerging markets have been unsteady or decreasing in the last few years. Yet, bond inflows to emerging markets have been on an upward trend, presenting an important funding channel for emerging market firms.
- Despite government bond issuance being high on historical levels, there is little evidence that this is crowding out productive investment through corporate bond markets, which have also been increasing strongly in terms of issuance.

(3) A search for yield is driving investment in corporate bond markets. A changing interest rate environment will create winners and losers.

- Corporate bond issuances can take a number of different forms:
  - *Financial vs. Non-Financial Firm issuance:* In 2013, two thirds of global issuance came from non-financial issuers. Financial issuances have been decreasing in developed markets. In emerging markets, both non-financial and financial issuances have been increasing;
  - *High Yield vs Investment Grade:* High yield issuances have increased in developed markets in the wake of the crisis, but have not grown significantly in emerging markets. In 2013, high yield issuances reached $550 billion;
  - *Local Currency vs Eurobond:* Local-currency issuances in both developed and emerging markets have increased since the onset of the crisis. Non-local currency issuances (Eurobond) have increased only in emerging markets;
  - *Issuances for refinancing purposes vs. for productive purposes:* Refinancing issuances have increased in both developed and emerging markets. Before the onset of the crisis, refinancing issuances in emerging markets were small;
  - *Short, medium and long-term:* Corporate bond issuance terms are generally long or medium-term. While short-term issuances increased after the onset of the crisis they still made up just 2% of total issuances in 2013.
- Each form of bond carries different elements of risk: interest rate risk, default risk, call risk, rollover risk, foreign exchange risk and liquidity risk.
- Accommodative monetary policies orchestrated by central banks in developed economies, have driven down interest rates and fuelled a search for yield, with higher yielding corporate bond products becoming increasingly popular.
- Relatively new or reemerging bond instruments such as Payment-In-Kind (PIK) and Contingent Capital (Contingent Convertible and Write-down bonds), which carry additional risks and potential for market manipulation, have also seen a strong increase in the last few years –

although still accounting for a tiny portion of the market ($18 billion and $15 billion respectively in 2013).

- On the whole, investment in relatively high yielding debt products (conventional high yield, PIK, Contingent Capital etc.) is small but not insignificant in the context of the corporate bond universe. As long as investors are well-informed, predominantly institutional and able to diversify risks, bond risks should likely be appropriately managed – although increasing interest rates in the near-term will create winners and losers.
- For example, an interest rate increase may actually have more impact on the value of investment grade issuances than on high yield issuances – if default rates remain at relatively low levels. In 2012, the default rate of high yield bonds was 3% compared to 4% for non-performing loans.
- For retail investors, participation in corporate bond markets is mainly via bond funds. Bond fund inflows surged in the years following the outbreak of the crisis. However, bond funds managers are able to diversify risks and hedge against interest rate changes, minimizing impacts.
- Individual issuances targeted directly at retail investors are small, driven mostly by issuers in the United States. Yet there has been some growth in the last few years. In 2013, retail issuances in developed markets reached $7 billion. Global data on this form of issuance is scarce. Further research could investigate the nature of this issuance and monitor the behavior of direct retail investors, especially when it comes to accounting for risk, as this market grows.

(4) Secondary markets are also transforming to adapt to a new economic and regulatory environment. Understanding the nature and reasons for this transformation is key in identifying future potential systemic risk issues and opportunities for market development.

- There is still uncertainty around the consequences of an interest rate shock on corporate bond secondary markets and what this means from a systemic risk perspective.
- Before the crisis, dealer banks were able and willing to provide liquidity to the markets since (1) a profit could be made from opaqueness around bid-ask spreads and (2) illiquid bonds could be packaged into structured debt products such as Collateralized Debt Obligations, offering further profit.
- In the second case, liquidity risk was kept artificially low while systemic risk was introduced into the system. For the purposes of this report, this liquidity is termed ‘phantom liquidity’ and refers to the injection of secondary market liquidity due to the proliferation of potentially systemically risky practices. Taking the United States as an example due to data availability:
- After the onset of the crisis, regulatory and internal bank risk controls curtailed the issuance of certain structured debt products. Following almost the same trend, dealer inventories of corporate bonds shrunk. Investors holding bonds now face increased liquidity risk, including retail investors participating via bond funds and exchange-traded bond funds.
- Dealers stepping away from their market maker role, could signal a reduced ability of the secondary market to absorb shocks in the case of a widespread bond sell-off e.g. as interest rates continue to rise. Even though trading is increasing, a number of research studies on the subject suggest that trading volume figures are being propped up by a small number of bonds being traded over and over.

- In the case of widespread redemptions, bond funds have a raft of tools they can use to minimize any hit to the value of their fund and ensure investors are redeemed in a timely manner. However turbulence in the secondary markets may undermine investor confidence.
- After this period of adjustment, new investors will most likely seek higher compensation for the liquidity risk they face. This means that issuing firms may have to price higher liquidity risk into the bond yield offered – increasing the cost of borrowing.
- To lower this liquidity risk (and thus the cost of borrowing), markets could transform through increased usage of multi-dealer electronic trading platforms that allow non-primary dealer actors to provide liquidity. This may require some standardization of bond issuance, a move that could erode the tailored financing nature of corporate bond markets compared to equity markets and other forms of financing.
- There is already evidence that such a transformation is taking place. The 'miniature stress test' of the late 2013 bond sell-off highlighted the resilience of the secondary markets. Trade sizes momentarily declined and there was an uptick in the use of electronic trading platforms during this period.
- Ultimately, as markets transform, issuing firms may choose to either standardize issuance in order to decrease liquidity risk and thus borrowing costs; or continue to issue tailored bonds but at a premium to account for reduced liquidity. This could result in a segmented market similar to listed equity and private equity markets; or standardized and over-the-counter derivative markets.
- Further research could explore what this new market structure would mean from a market development, systemic risk and investor protection perspective, especially with around $11.3 trillion worth of corporate debt due to mature in the next seven years (2014-2020). Almost $3 trillion of this will be refinancing issuances.

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❑ Chapter 1 – Introduction

Corporate bond markets can be considered an important ingredient in economic growth, financial stability and economic recovery, particularly in the wake of the crisis. [2] They provide a key capital funding flow to firms allowing them to expand, innovate, offer employment, and provide the goods and services societies demand.

Supranational bodies, such as the G20, have recently highlighted the valuable role of securities markets, including corporate bond markets,[3] in terms of providing long-term financing.[4] The International Monetary Fund (IMF), European Bank for Reconstruction and Development (EBRD) and Organization for Economic Co-Operation and Development (OECD) also released a joint 'diagnostic framework' in July 2013 encouraging and guiding the development of local currency bond markets.[5] In 2004 and 2011, IOSCO released reports looking into different aspects of corporate bond markets (*see below*).

Building on this previous work, this series of reports provides an up-to-date and global perspective of corporate bond market trends since 2004 (2000 where data allows), and identifies particular issues that may require further consideration from the perspective of market efficiency, systemic risk and investor protection.

Purpose of this Report Series

IOSCO recognizes the importance of sound development of global corporate bond markets. Accordingly, as part of IOSCO's mission and objectives,[6] member regulators agree to monitor, regulate and develop corporate bond and other securities markets, while:

1. Protecting investors;[7]
2. Ensuring markets are fair, efficient and transparent; and
3. Reducing systemic risk.[8]

IOSCO has already provided insights into some aspects of corporate bond markets. 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.[9] The report noted the potential for significant growth in EM corporate bond markets, but also highlighted that corporate bond markets remained under-developed in many EMs, particularly relative to bank credit and equities markets.

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[2] See Asli Demirguc-Kunt, Erik Feyen, Ross Levine, "The Evolving Importance of Banks and Securities Markets", NBER Working Paper No. 18004, April 2012; IMF, EBRD, OECD, "Local Currency Bond Markets – A Diagnostic Framework", July 2013; Levine, Ross and Zervos, Sara, Stock Markets, Banks, and Economic Growth, World Bank Policy Research Working Paper, December 1996; Patara Thumrongvit, Yoonbai Kim, Chong Soo Pyun, "Linking the missing market: The effect of bond markets on economic growth", *International Review of Economics and Finance,* Vol 27, June 2013; Nils H. Hakansson, 'The role of a corporate Bond Market in an Economy – and in Avoiding Crises', Dec 1998*;* 'Economic Importance Corporate Bond Markets', ICMA, March 2013

[3] In November 2011, G20 endorse an action plan to support the development of local currency bond markets.

[4] G20 Communique, 2013

[5] IMF, EBRD, OECD, "Local Currency Bond Markets – A Diagnostic Framework", July 2013

[6] IOSCO Objectives and Principles of Securities Regulation [see http://www.iosco.org/library/pubdocs/pdf/IOSCOPD154.pdf

[7] IOSCO has set up a new Committee on Retail Investors issues. Also see IOSCO's recent report, 'Investor Education: Initiatives Relating to Investment Services', February 2013.

[8] See IOSCO, 'Securities Markets Risk Outlook 2013-2014', October 2013

[9] 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]:

In addition, in 2004 IOSCO published a report investigating corporate bond market transparency.[10] 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 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 developed and emerging markets. IOSCO also has launched a *data gathering project,* aimed at addressing data shortages in securities markets in EMs.

To support this work, the purpose of this staff working paper series is threefold:

(1) To provide the IOSCO membership (as the global body of securities markets regulation) and the public at large with a global and country-level overview of the functionality of corporate bond markets over the last decade, based on available data. Indicators and data gathered will feed into the IOSCO Research Departments recently developed *statistical website.*[11]

(2) To present a data-driven analysis of corporate bond markets globally, identifying issues in terms of market development and presenting them in a broader economic and financial landscape.

(3) Identify data gaps and provide a foundation for future research and policy work, relating back to IOSCO's mission of investor protection, reduction of systemic risk and encouragement of sound and efficient securities markets.

What are corporate bonds?

For the purposes of this report, corporate bonds have been defined to include all bonds except those issued by national and local governments, and supranational organizations.[12] As such, corporate bonds include those issued by financial and non-financial institutions.

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 bonds are traded amongst market participants and investors. Corporate bonds may be secured or unsecured.[13] They can take many forms including vanilla,[14] zero-coupon,[15] payment in kind (PIKs),[16] Sukuk[17],

[10] IOSCO, 'Transparency of Corporate Bond Markets', 2004 [http://www.cnmv.es/publicaciones/IOSCO_mercados.pdf]
[11] See www.iosco.com/research
[12] Asset backed securities, supra sovereign and agency bonds and medium-term notes are not included in the data
[13] Secured bond refers to a bond secured by an issuer's pledge of a specific asset. If default occurs, the issuer must pass over the asset as collateral. Unsecured bonds are not collateralized.
[14] A straight or 'vanilla' corporate bond refers to a traditional bond that involves an investor (lender) purchasing a bond at its face value, receiving periodic interest payments from the bond issuer (borrower) and receiving the full principal back once the bond matures.
[15] A zero-coupon bond (or discount bond) is bought at a 'discount' – so that the bondholder purchases the bond at a lower price than its face value. The borrower does not pay interest payments (coupons) during the duration of the bond, however when it matures the investor gains back the full value even though they bought it at a discount.
[16] PIKs do not include cash flow from the issuer of the bond to the bondholder, while the bond is held. Instead, interest is accrued during the holding period and paid back at time of maturity. PIKs tend to be viewed as high-risk but can be attractive since they sometimes include stock options – allowing the lender to buy equity in a firm at a fixed price.
[17] 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-

CoCos[18] and structured.[19] These issues can vary widely in terms of the coupon payments, maturities, issue amounts, credit ratings, and contractual features.[20]

From an issuer's perspective, corporate bonds can be used to raise capital to invest in business activities, refinance existing debt and balance portfolios. From an investor's perspective, corporate bonds can be invested in individually, as part of a fund (bond fund) or used to underpin structured products as a way to diversify counterparty risk. Direct investors in corporate bonds are predominantly institutional. However both retail and institutional investors may choose to invest in bond funds. Investors can hold bonds till maturity (buy and hold strategy) and receive yield payments, or trade bonds on the secondary market.

Broadly, corporate bonds may be classified as investment grade or high yield.[21] Classification into these categories is primarily decided based on the rating given to the bond by credit rating agencies and is generally derived from the level of risk associated with a bond. The marketplace itself assesses and indicates this level of risk by demanding and offering a certain yield over a benchmark (usually the US Treasury yield curve).[22]

Structure

This staff working paper series is divided into three separate volumes. **Volume I (global)** provides a view of how global corporate bond markets have changed, comparing developed and emerging markets. In recognizing the heterogeneity within the regions, **Volume II (emerging markets)** and **Volume III (developed markets)** provides more granular country-by-country data and analysis.

The structure of this Volume (Volume I) is as follows

Chapter 1 briefly defines corporate bonds and highlights some of the benefits associated with well-developed corporate bond markets. **Chapter 2** outlines the methodology used to compile and analyze the available data and to overcome data limitations – such as comparability issues and some large data gaps. It also presents the indicators underpinning the analysis of market size and development, importance and activity across jurisdictions. **Chapter 3** identifies some major trends related to corporate bond market development, over the last decade. **Chapter 4, 5, 6** identifies some major themes in the recent economic and financing landscape that may be relevant for corporate bond markets globally. **Chapter 7** concludes by identifying areas for further research.

Securities Commission Malaysia report, released 2013), the IOSCO 2013 *Risk Outlook*, and the IOSCO Statistics Web Portal (http://www.iosco.org/research/?section=statistics).

[18] A CoCo bond or 'contingent convertible bond' has two prices - a conversion price and a contingent conversion price. The conversion price is the price for exchanging or 'converting' a bond for stocks. The contingent conversion price is a higher price that must be met before the bond can be converted.

[19] Structured bonds are hybrid instruments consisting of a bond (which holds a large portion of the principal invested) and some other form of instrument such as a derivative that holds the rest.

[20] Contractual features can include use of principal for capital expenditure (CAPEX) e.g. to purchase fixed assets in order to increase firm value and productivity; and use of principal for daily funding needs.

[21] Classifications depend on the rating agency.

[22] The yield is equal to the compensation for risk of non-payment and as usually measured based on two components: inflation and risk of default. The higher the yield, the higher the perceived risk that needs to be compensated.

❑ Chapter 2 – Methodology

IOSCO has a diverse membership covering both developed and growth and emerging markets. Corporate bond market trends and characteristics can differ significantly within and between these categories. As such, data has been gathered and assessed at the aggregate level as well as individually for 91 jurisdictions - 23 developed market datasets and 68 emerging market datasets.[23]

A methodology for overcoming data limitations inherent in the sample, processing the large dataset and facilitating analysis, has been developed for all three volumes of this report series. This chapter describes the approach used for **Volume I** only.

Building a Global Perspective

This report presents global and regional level aggregated data, derived from the following countries:

Argentina	Australia	Austria	Azerbaijan	Belgium	Bulgaria	Bahrain	The Bahamas	Belarus
Barbados	Bermuda	Botswana	Brazil	Canada	China	Croatia	Chile	Colombia
Costa Rica	Cyprus	Czech Republic	Denmark	Dominican Republic	Estonia	El Salvador	Egypt	Finland
France	Germany	Greece	India	Hong Kong	Hungary	Indonesia	Ireland	Israel
Italy	Iceland	Jordan	Japan	Jamaica	Jersey	Kazakhstan	Kenya	Kuwait
Lebanon	Luxem-bourg	Latvia	Lithuania	Malaysia	Malta	Macao	Mexico	Mozambique
Morocco	Mexico	Nigeria	Netherlands	New Zealand	Norway	Oman	Poland	Portugal
Philipp-ines	Peru	Panama	Pakistan	Qatar	Rom-ania	Russia	Saudi Arabia	Slovakia
Slovenia	South Korea	Spain	Singapore	Sri Lanka	Sweden	Switzerland	South Africa	Chinese Taipei
Thailand	Trinidad and Tobago	Tunisia	Turkey	United Kingdom	United States	United Arab Emirates	Ukraine	Vene-zuela
Vietnam								

This list has been selected based predominantly on (comparable) data availability. Nevertheless, for some of the countries in the sample, a full set of corporate bond markets data is not available. This is indicated in the body of the report.

The authors adopted an inductive, exploratory (content-driven) approach: first collecting all available (comparable) data, performing a literature and media analysis and developing indicators to interpret the collected information (see Annex A for a description). Based on the outcomes of this first step, the authors have identified a number of trends and issues that are (1) used to frame the data presentation and analysis in this report; and (2) spur future research efforts.

The indicators used have been specifically chosen or developed to outline global fixed income market conditions, identify global trends, and compare conditions in and among developed and emerging economies. This report also produces rankings; and uses time series and trend analysis. Analysis is supported by literature review where appropriate.

[23] These jurisdictions were selected on the basis of the availability of complete and comparable data.

The data presented in this report series is disclosed on a historical period of approximately 2000-2013. The exact period used for each indicator, however, depends on specific data availability and is therefore not consistent across the whole report series. In general, the data points of 2004, 2007 and 2013 have been selected to underpin most of the analysis. The starting date of 2004 was chosen due to relatively high data availability across both developed and emerging countries in this year; with the midpoint of 2007 chosen to mark the crisis. 2013 data has been annualized from data extracted end September 2013, unless otherwise indicated.

Caveats

The number of major data sources used to support analysis was capped at seven in total, in order to manage analysis and maintain comparability. The main data sources underpinning the findings and conclusions in this report are therefore: Dealogic, Bloomberg, Bank of International Settlements, Asian Bonds Online, SIFMA, IMF and the World Bank. Indicators, charts and graphs have been developed by the authors, unless otherwise indicated.

September 30 2013 marks the end of the general data gathering exercise for this report series, unless otherwise indicated. However, at the time of publishing it is acknowledged that 2013 Q4 was characterized by heightened anticipation over an end to US quantitative easing, with implications for many of the trends and figures reported.[24] Where possible, figures have been updated or 2013 Q4 conditions have been elaborated in the text.

Aggregate groupings and selected jurisdictions do not and are not intended to, reflect judgment on current international boundaries. Availability of data varied 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.

Rankings are based on data available through Bank of International Settlements (BIS), Bloomberg, Asian Bonds Online (ABO) and Dealogic. Individually, these data sources provide only partial information and so the authors have combined data sources where appropriate to create as complete a dataset as possible.[25] Given the incompleteness of the datasets, rankings and comparable figures should not be considered absolute. They are merely a method for discerning broad trends from a global perspective.

Of particular note: corporate bond market size and depth can be inferred from the value of total amount outstanding of corporate debt. However, the definition of 'corporate debt or bonds' can differ depending on which data source is used. It is important to note that for this report, valuations of corporate bond market size are based on data from the BIS and ABO. This is because, combined, these data sources represent a large sample of countries. Furthermore, these datasets include a similar definition of corporate bond outstanding and are thus comparable e.g. both data sets allow derivation of corporate bond outstanding for non-financial *and* financial corporations.

Data on issuance volumes from Dealogic, does not include the following form of debt in the figures: preferred share, asset-backed, mortgate-backed, sovereign, local authority, supranational, covered, US agency, non-US agency, medium-term note, short-term debt, money market.

[24] See IOSCO Securities Markets Risk Outlook 2013-14, October 2013

[25] For example, BIS data provides accurate data on corporate bonds amount outstanding (when compared to Bloomberg), however Bloomberg covers more countries. Asian Bonds Online provides corporate bonds amount outstanding for some EMs. Dealogic provides data on issuance volumes only but covering a number of DM and EMs.

❑ Chapter 3 – Corporate Bond Market Development

Well-developed corporate bond markets can be considered an important element in enduring financial stability and economic growth. [26] Over the last decade, corporate bond markets have grown both in terms of size and in terms of their importance to the real economy. This growth is not just restricted to developed markets. A number of emerging markets have nurtured well-developed corporate bond markets as access to and activity within corporate bond markets has increased globally.

Issuances in both emerging and developed markets include high yield, investment grade, those in local and non-local currency (Eurobonds); refinancing issuances; and those issued from either financial or non-financial issuers. The demand and supply factors underpinning these different issuances can vary and as such, markets for these bonds have developed somewhat differently, especially after the onset of the crisis.

3.1 Market Size and Depth

Global corporate bond markets have almost tripled in size since 2000; however growth stabilized with the onset of the crisis. Figure 1 presents the growth trend between 2000 and 2013 of corporate bonds amount outstanding (a measure of market size) at the global level and for developed and emerging markets. The first graph shows total amount outstanding of corporate bonds and includes both financial and non-financial outstanding. This trend is compared with GDP growth, to show the size and growth of global corporate bond markets, relative to the economy. What is revealed is that growth was strong for corporate bonds outstanding, relative to GDP, in the pre-crisis period.[27] The compound annual growth rate (CAGR) of GDP between 2000 and 2007 (the pre-crisis period) averaged 7% while the CAGR of corporate bond markets was 11%. After the onset of the crisis however, growth of corporate bond markets stabilized, with a CAGR of 2%, growing from $44 trillion in 2007 to $49 trillion in 2013. GDP growth also retreated during this period but not as much, with a CAGR of 4%. This trend is reflected in developed and emerging markets.

Flattening growth in global corporate bonds outstanding post-crisis is attributable to deleveraging in the financial sector in developed markets, as well as economic recession. However, in terms of the real-economy, global corporate bond markets continue to increase in size. The second graph in Figure 1, compares total outstanding from financial corporations and total outstanding from non-financials. This chart shows differing trends between these two categories. Between 2000 and 2007, the CAGR for financial outstanding was 12%, while the CAGR for non-financial outstanding was 8%. After the onset of the crisis, non-financial outstanding continued to grow at a CAGR of 8% increasing to $16 trillion in 2013. In contrast, financial outstanding faced a negative growth trend with a CAGR of -1%, reaching $33 trillion in 2013.

In developed markets, total outstanding from financial firms was still greater than the outstanding amount from non-financial firms in 2013 ($33 trillion vs. $13 trillion), although the gap has been

[26] See Patara Thumrongvit, Yoonbai Kim, Chong Soo Pyun, "Linking the missing market: The effect of bond markets on economic growth", *International Review of Economics and Finance,* Vol 27, June 2013

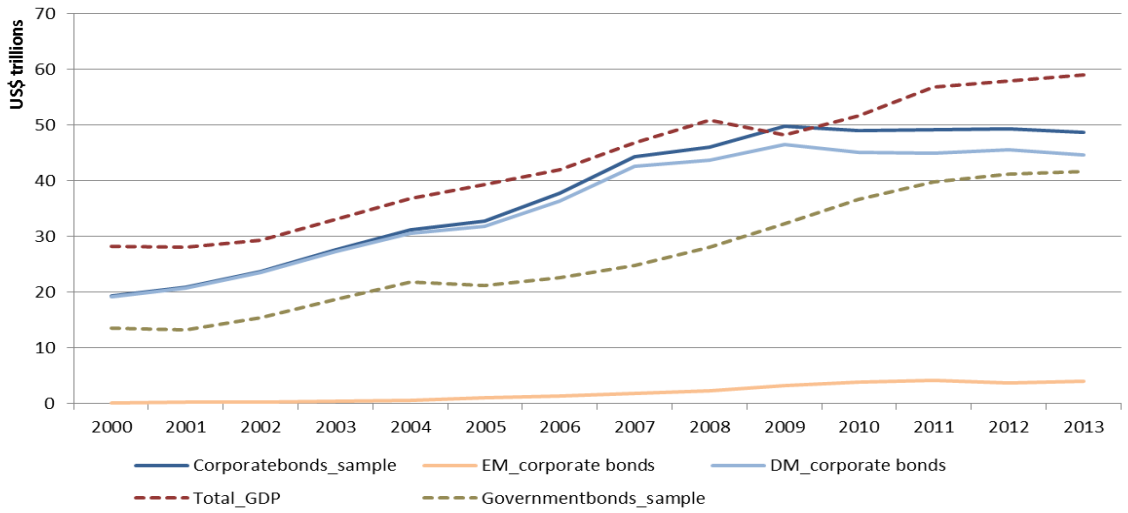
[27] The pre-crisis period refers to 2000-2007 for the purposes of this report.

shrinking since 2009. In emerging markets, non-financial outstanding had effectively overtaken financial outstanding ($3 trillion vs $1 trillion) by 2013.

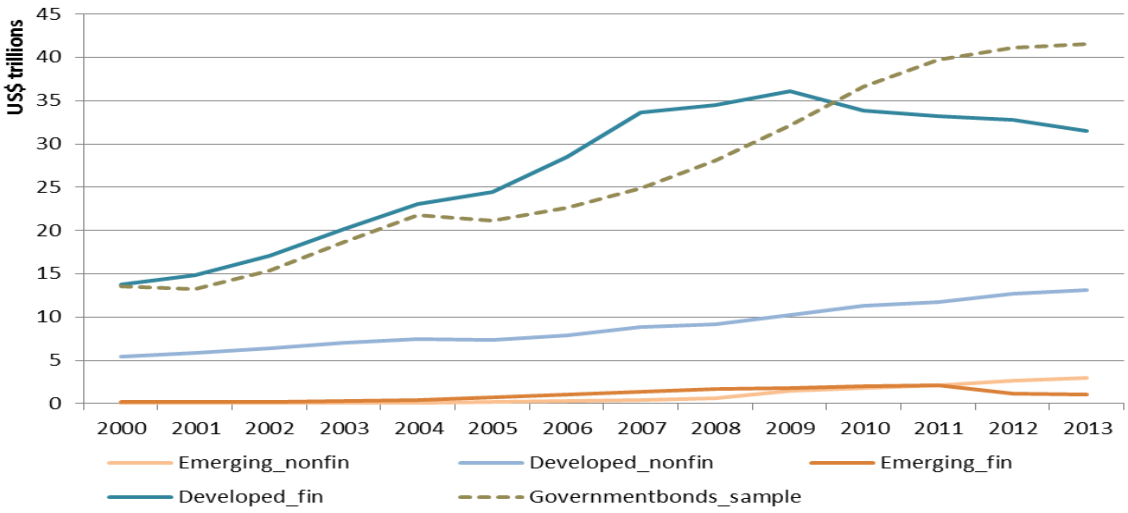
The changing issuer make-up reflects deleveraging in the financial sector. By 2009, the cross-border activities or banks as well as interbank lending adjusted to new slower economic conditions, more cautious investor sentiment, and stricter regulatory circumstances. The new business model of banks saw a shrinking of balance sheets and refocus on business in the domestic economy. Corporate debt,[28] previously issued to fund expansion of banking activities, thus reduced.

Figure 1: Corporate Bonds, government bonds (amount outstanding) and GDP

Financial and non-financial combined



Financial and Non-financial disaggregated



Source: BIS (total debt securities, sum of financial and non-financial corporations), AsianBondsOnline (ABO), SIFMA data for the US. IMF
Note: All aggregated figures e.g. Developed, Emerging and World, are calculated based only on the countries analyzed for this report and where data is available. Data for some major economies is not included in the corporate and government bond market size total due to unavailability e.g. India, Mexico, Brazil, New Zealand, Switzerland. Note 2: 2013 figure as of March 2013 Note 3: Totals include data derived from ABO, which means that aggregate measures may differ from BIS analysis. Note 4: BIS and ABO data on corporate bonds outstanding includes issuances from both non-financial and financial corporations (public and private companies.

Non-financial firms include a diverse range of issuer types. According to Dealogic, the ten major non-financial issuer types between 2000 and 2013 in developed markets include Utility & Energy, Telecommunications, Oil & Gas, Insurance, Healthcare, Computers & Electronics, Transportation,

[28] Especially unsecured and covered bonds

Food & Beverage, Auto/Truck and Retail. In emerging markets the ten major issuer types since 2000 include Oil & Gas, Utility & Energy, Construction/Building, Transportation, Telecommunications, Metal & Steel, Real Estate/Property, Mining, Chemicals, Food & Beverage.

The economic recession has also seen strong increase in government bonds outstanding. For the countries where data is available, total government bonds outstanding reached $42 billion in 2013, compared to $14 billion in 2000 (see Figure 1). In the literature and economic theory, debate exists over the impact of growth in this market on private sector financing opportunities – including corporate bond financing (See Box 1). As mentioned, non-financial corporate debt servicing is still increasing steadily, despite elevated government bonds outstanding. However, as accommodative monetary policies such as asset purchasing programs and quantitative easing in the developed world are reversed, long-term interest rates will increase (see *Chapter 4*). Further research could explore the implications of this in the context of potential crowding out of corporate debt and what this may mean for economic growth, especially as economies move towards market-based financing (*see Chapter 6*).

Box 1: Crowding out and Crowding in

The neoclassical 'crowding out' theory suggests that under certain conditions, such as recession, an increase in government bond issuance will transfer a portion of investment away from private sector enterprises and towards financing public debt.[29] This is because a surge in government issuance can inflate interest rates – increasing borrowing costs for private markets[30] and making the sovereign debt of certain countries more attractive than even corporate high yield issuances. This effect can be exacerbated by shallow financial markets and decreased reliance on bank lending for corporates. [31] An exacerbating factor also suggests that a high amount of external government debt could deter foreign credit to the private sector in that country due to an increased vulnerability to a sovereign debt crisis.[32]

The Keynesian 'crowding in' theory proposes instead that government debt, if incurred to stimulate the economy, will actually support investment in private sector enterprises, for example by improving investor confidence. Specifically, regular and standardized issuance of government debt can play a key role in the development of corporate bond markets. In emerging markets, robust government bond markets can encourage and mobilize an investor base that can be tapped into by corporate bond issuers.[33] Lastly, Ricardian Equivalence may suggest that where government debt is serviced through bond issuance rather than increased taxation, potential investors are left with more liquidity to inject into the private sector.[34]

[29] Robert Barro, 'Government Spending in a Simple Model of Endogenous Growth', *Journal of Political Economy*, vol 98, 1990; Habib Ahmed and Stephen M Miller, 'Crowding-out and crowding-in effects of the components of government expenditure', *Contemporary Economic Policy*, vol 18, 2000; Manmohan Kumar and Jaejoon Woo 'Public debt and growth', IMF Working Paper, WP/10/174, July 2010.

[30] See Fernando Broner, Aitor Erce, Alberto Martin, Jaume Ventura, 'Sovereign Debt Markets in Turbulent Times: Creditor Discrimination and Crowding-Out Effects', October 2013

[31] Peter Claeys, Rosina Moreno, Jordi Surinach, 'Debt, interest rates, and integration of financial markets', *economic modelling*, 2012

[32] Senay Agca and Oya Celasum, 'How does Public External Debt Affect Corporate Borrowing Costs in Emerging Markets', IMF Working Paper, December 2009

[33] Benjamin M Friedman, "Crowding out or Crowding in? The Economic Consequences of Financing Government Deficits", NBER working paper No. 284, 1979

[34] Barro (1974)).

The 'gap-filling' hypothesis suggests that where government bond issuance is absorbed by the public sector, as a result of accommodative monetary policies, interest rates remain low and corporate bonds continue to present as an attractive channel of liquidity.[35]

The largest corporate bond markets are located primarily in developed markets, however global concentration is reducing and some emerging markets are catching up. In 2013, developed markets effectively accounted for 92% of global corporate bond market size. However, when taking outstanding from financial firms out of the equation, the size of emerging and developed corporate bond markets is much closer. In 2013, total outstanding for non-financial firms in developed markets was only four times as large as that of emerging markets. [36]

Figure 2 provides rankings based on the size of corporate bond markets.[37] Since 2004, the makeup of the top 10 markets (excl the US) has stayed relatively stable. However, concentration of corporate bond outstanding in these markets and the United States (US) together has been reducing. In 2004, these markets and the US combined accounted for 94% of total amount outstanding but by 2013, they accounted for just 87%. In particular, the United States share of global corporate bonds outstanding has been shrinking steadily over this period – accounting for 51% in 2004, 49% in 2007 and 44% in 2013.

In the meantime, some emerging markets have been catching up. In 2013, the emerging markets of China, South Korea,[38] Russia, Malaysia and Thailand all ranked in the top 20 (excl the US) in terms of size of their corporate bond markets. Meanwhile, the developed markets of Portugal, Singapore, Hong Kong, Finland and Greece ranked in the smallest 19.

Nevertheless, there is a large disparity in size between the largest and smallest markets. In 2013, the total amount outstanding of the United States was $21 trillion; for the top 10 markets (excl. the US) the average amount was $2 trillion; and for the smallest 10 markets the average amount was $18 billion.

[35] Jeremy Stein, Robin Greenwood and Samuel Hanson "A Gap-Filling Theory of Corporate Debt Maturity Choice". The Journal of Finance Vol. LXV, 3 June, 2010

[36] According to ABO and BIS data. Although not all countries are captured in this dataset, the countries included cover a significant part of global corporate bond markets.

[37] derived from BIS and ABO data

[38] Data for South Korea was not available for 2004 and 2007.

Figure 2: Size rankings

2004 (31 108 US$, bns)			2007 (44 289 US$, bns)			2013 (March) (48 645 US$, bns)		
1	United States	15891.1	1	United States	21492.0	1	United States	21036.1
2	Japan	3504.9	2	United Kingdom	3670.3	2	Japan	3670.0
3	Germany	2429.0	3	Japan	3497.9	3	United Kingdom	3467.6
4	United Kingdom	2255.0	4	Germany	2940.4	4	France	2396.7
5	France	1340.8	5	France	2036.2	5	Germany	2082.1
6	Netherlands	1054.0	6	Netherlands	1657.2	6	Netherlands	1826.7
7	Italy	839.7	7	Spain	1403.4	7	Italy	1624.6
8	Australia	611.4	8	Italy	1249.4	8	China*	1572.4
9	Canada	491.8	9	Australia	1103.8	9	Australia	1428.6
10	Denmark	457.5	10	China	1060.9	10	Spain	1365.0
11	Spain	448.8	11	Denmark	665.1	11	South Korea*	1142.7
12	China	336.8	12	Canada	664.5	12	Ireland	1119.3
13	Sweden	239.5	13	Sweden	435.7	13	Canada	821.8
14	Austria	237.1	14	Austria	380.2	14	Luxembourg	723.8
15	Ireland	160.8	15	Ireland	373.9	15	Denmark	680.2
16	Norway	149.4	16	Norway	260.6	16	Sweden	617.0
17	Belgium	123.7	17	Belgium	148.3	17	Norway	415.1
18	Luxembourg	104.8	18	Russia	145.8	18	Austria	364.8
19	Finland	78.5	19	Luxembourg	137.8	19	Russia	305.3
20	Portugal	68.9	20	Malaysia	130.7	20	Belgium	263.8
21	Hong Kong SAR	63.3	21	Finland	120.0	21	Malaysia	219.5
22	Singapore	62.1	22	Portugal	114.7	22	Thailand	218.8
23	Russia	32.0	23	Thailand	111.6	23	Portugal	218.4
24	Argentina	26.0	24	Singapore	97.8	24	Singapore	196.7
25	Thailand	25.8	25	Hong Kong SAR	75.3	25	Hong Kong SAR	165.8
26	Poland	18.1	26	Israel	57.9	26	Finland	161.6
27	Israel	17.6	27	Indonesia*	45.0	27	Israel	93.0
28	Hungary	12.3	28	Argentina	43.6	28	Greece	89.2
29	Philippines*	7.0	29	Czech Republic	38.1	29	Poland	74.3
30	Greece	6.7	30	Poland	32.8	30	Czech Republic	55.4
31	Cyprus	4.9	31	Greece	29.9	31	Indonesia*	53.2
32	Slovakia	3.8	32	Hungary	24.5	32	Argentina	42.9
33	Croatia	2.2	33	Cyprus	12.4	33	Hungary	36.1
34	Slovenia	1.8	34	Philippines*	9.9	34	Turkey	33.4
35	Malta	1.1	35	Slovakia	7.8	35	Philippines*	27.3
36	Turkey	0.4	36	Vietnam	5.3	36	Vietnam	12.4
			37	Croatia	3.8	37	Cyprus	8.2
			38	Slovenia	2.7	38	Slovakia	5.6
			39	Turkey	1.3	39	Croatia	4.3
			40	Malta	1.2	40	Slovenia	4.2
						41	Malta	1.5

Source: BIS (total debt securities, sum of financial and non-financial corporations), AsianBondsOnline (ABO) corporate bond value. Countries marked with an (*) are ABO data. Note 1: last available data ends September 2013. Note 2: BIS data on US corporate bonds outstanding differs from SIFMA data. This is because BIS data includes non-financial and financial corporations, including outstanding of bonds from central banks. BIS data is used here for cross-country comparability purposes, as ABO data also includes financial corporation issuance covering central banks. Note 3: Since rankings include data derived from ABO, proportional measures may differ from BIS analysis. For example, according to BIS reporting countries only.

The depth of these markets (outstanding as a percentage of domestic GDP) has increased in both developed and emerging markets. Corporate bond market depth is an alternative measure of size, indicating the size of a market compared to the domestic economy. It can also give some information on the importance of a market to the economy.[39] Deepening capital markets suggest that they are being increasingly tapped into to meet the financing needs of an economy.

Figure 3 presents country rankings based on market depth. Market depth for corporate bond markets globally averaged 57% of domestic GDP in 2004, increasing to 64% in 2007 and then to 98% in 2013. On average, developed markets had the deepest corporate bond markets with a market depth of 169% in 2013. [40] While corporate bond markets in emerging markets are, on average, less deep than developed markets, there has been a clear deepening trend since 2004 – with market depth equaling 12% in 2004, 21% in 2007 and 24% in 2013. Furthermore, some emerging markets actually have deeper markets than some developed markets. The emerging markets of Malaysia,

[39] In this report, market depth is used in the context of 'financial market depth'. According to the World Bank, corporate bond market depth can give some indication of the importance of these markets relative to the economy and the general financial structure. It can be calculated as the size (amount outstanding) of the market relative to GDP (see: http://econ.worldbank.org).

[40] 117% in 2013 when excluding Luxembourg

Thailand and South Korea had corporate bond markets greater than 50% of their GDP. Meanwhile, the developed markets of Canada and Greece had market depth lower than 50% of their GDP.

As with market size, there is a large disparity between the deepest and shallowest markets. The top 10 countries (excl Luxembourg) had an average market depth of 171% in 2013. The shallowest 10 markets had an average market depth of 8% in 2013. Luxembourg alone has boasted the deepest markets since 2004, equaling almost 1200% of GDP in 2013.

Figure 3: Market Depth rankings

	2004 (% of GDP)		2007 (% of GDP)		2013 (March) (% of GDP)	
1	Luxembourg	307.1%	Luxembourg	268.0%	Luxembourg	1195.6%
2	Denmark	186.9%	Denmark	213.6%	Ireland	506.7%
3	Netherlands	172.6%	Netherlands	211.5%	Netherlands	228.2%
4	United States	129.4%	United States	148.4%	Denmark	209.8%
5	United Kingdom	101.5%	Ireland	143.9%	United Kingdom	139.3%
6	Australia	93.3%	United Kingdom	128.4%	United States	125.8%
7	Germany	89.0%	Australia	116.8%	Sweden	111.8%
8	Ireland	86.2%	Austria	101.2%	Spain	100.7%
9	Austria	81.3%	Spain	97.2%	Portugal	99.6%
10	Japan	75.3%	Sweden	94.2%	Australia	96.0%
11	Sweden	66.1%	Germany	88.3%	South Korea*	95.4%
12	France	65.1%	Japan	80.3%	France	87.5%
13	Norway	57.5%	France	78.7%	Austria	87.3%
14	Singapore	55.1%	Malaysia	67.5%	Norway	80.5%
15	Italy	48.3%	Norway	66.2%	Italy	78.5%
16	Canada	48.3%	Italy	58.7%	Japan	73.3%
17	Spain	42.9%	Cyprus	56.8%	Malaysia	70.3%
18	Finland	41.4%	Singapore	55.0%	Singapore	68.4%
19	Portugal	37.1%	Portugal	49.4%	Finland	62.3%
20	Belgium	34.2%	Finland	48.7%	Germany	57.9%
21	Cyprus	31.2%	Canada	45.6%	Thailand	54.6%
22	Malta	19.1%	Thailand	45.2%	Belgium	52.0%
23	China	17.4%	Israel	33.1%	Canada	45.0%
24	Argentina	17.1%	Belgium	32.2%	Cyprus	37.8%
25	Thailand	16.0%	China	30.4%	Greece	36.7%
26	Israel	13.4%	Czech Republic	21.1%	Israel	34.1%
27	Hungary	12.0%	Hungary	18.0%	Czech Republic	27.9%
28	Slovakia	8.9%	Argentina	16.8%	Hungary	27.6%
29	Philippines*	7.7%	Malta	15.1%	China*	19.6%
30	Poland	7.1%	Russia	11.2%	Malta	15.6%
31	Russia	5.4%	Slovakia	10.4%	Poland	14.5%
32	Croatia	5.3%	Indonesia*	10.4%	Russia	14.4%
33	Slovenia	5.2%	Greece	9.8%	Philippines*	10.0%
34	Greece	2.9%	Poland	7.7%	Slovenia	9.0%
35	Turkey	0.1%	Vietnam	6.8%	Argentina	8.9%
			Philippines*	6.7%	Croatia	7.3%
			Croatia	6.4%	Vietnam	7.3%
			Slovenia	5.8%	Indonesia*	6.1%
			Turkey	0.2%	Slovakia	5.7%
					Turkey	4.1%
					Indonesia*	2.2%

Source: Bank of International Settlements, ABO data on amount outstanding against GDP data from IMF. Note: countries marked with (*) derived from ABO data.

Interestingly, countries with relatively large corporate bond markets do not necessarily have relatively deep corporate bond markets, and vice versa. There are some countries that register in the top 10 in terms of corporate bond market size, but not in terms of corporate bond market depth – and vice versa (see Table 1 for some examples). Volume II and III of this report series will analyze the bond markets of specific countries to decipher such trends.

Table 1: Size and Depth ranking comparison

Country – 2013 rankings	Size	Depth
Japan	2	16
France	4	12
Germany	5	20
Italy	7	15
China	8	29
Luxembourg	14	1
Denmark	15	4
Portugal	23	9

A more comprehensive and broad dataset on corporate bonds amount outstanding, would allow improved understanding of relative market size and depth across emerging and developed markets. The dataset underpinning these rankings covers a small set of emerging market countries. A Bloomberg dataset includes more emerging markets and positions Jamaica, the Bahamas, Argentina, South Korea and the United Arab Emirates in the top 10 in terms of depth, in 2013. Iceland, which dominated in 2004 and 2007, dropped to the tail of the rankings in 2013. This suggests that additional emerging and developed markets may enjoy larger corporate bond market size and depth than indicated in the provided rankings. However, the Bloomberg ranking only provides information on exchange-traded bonds – a fraction of total amount outstanding. Further data collection on total amount outstanding would assist in better understanding of bond market size and depth across a larger number of developed and emerging markets.

3.2 Market Access, Issuance Activity and Importance

Firms have been increasingly active in corporate bond markets over the last decade, despite a dip in activity in 2009/2010. Corporate bond market issuance volume provides an indication of activity in the primary market. Issuance volumes are flow indicators and thus can be sporadic as corporates generally issue to meet particular financing needs rather than at set intervals. Nevertheless, a high or rising level of issuance can suggest that access to corporate bond markets is improving (e.g. costs have lowered), as firms tap into these markets to meet financing needs.

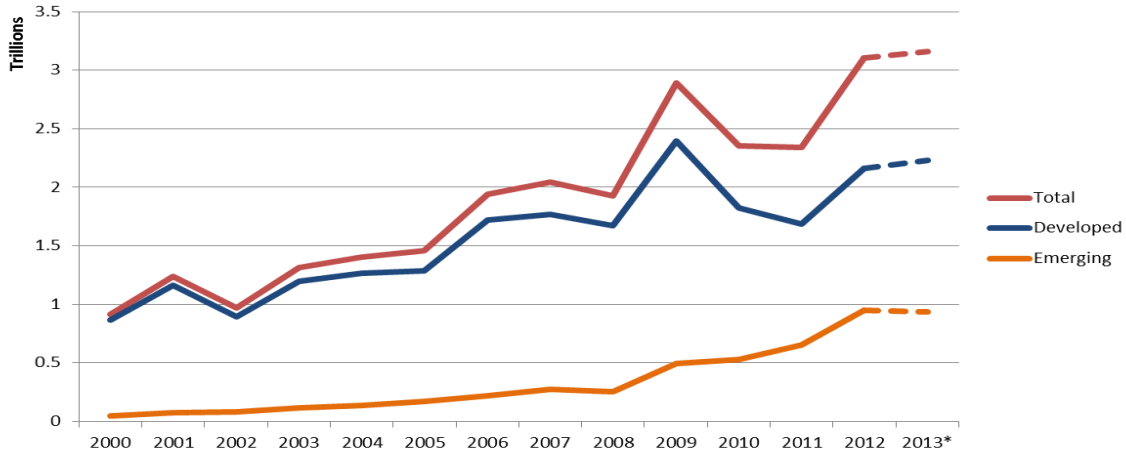
Figure 4 presents trends in corporate bond issuance volumes over the period 2000 to 2013. The data reflects issuance of corporate bonds only and does not include asset-backed securities, supra/state/agency bonds or medium-term notes. In 2000 issuance volume was around $0.9 trillion. By 2013 issuance volume had reached around $3.2 trillion. According to the data provider Dealogic, corporate bond market activity has been recorded for 27 new economies in the last 13 years, particularly emerging markets. In 2000, 54 countries recorded a total of 3330 corporate issuances. By 2013, this figure had risen to 81 countries (8140 issuances). This could indicate that firms in more countries now have access to bond markets and/or be related to data availability improving over the last decade.

After the onset of the crisis the issuance levels in developed and emerging markets began converging. Emerging market issuances jumped in 2009, increased strongly each year after and reaching $934 billion in 2013. In contrast, issuance in developed markets has been more volatile - issuance activity also jumped in 2009, reaching $2.4 trillion before reducing to $1.6 trillion in 2011,

as the emerging euro-crisis took hold. By 2013, issuance activity had rebounded somewhat reaching $2.3 trillion.[41]

Breaking down this data[42] confirms a widening global distribution of corporate bond market activity**.** In 2013, emerging markets constituted around 30% of total issuances vs just 5% in 2000. The origination of issuances has also changed at the regional level. Since 2000, issuers domiciled in the Asia Pacific region have accounted for an increasing proportion of global issuance, with a concomitant reduction in the percentage accounted for by Europe, Middle East and Africa (EMEA) issuers, and a very slight reduction in the percentage accounted for by issuers based in the Americas. In 2000, issuances for the Americas accounted for 44% of total issuances, Asia Pacific issuances accounted for 15% of issuances and EMEA accounted for 41% of issuances. In 2013, the proportion of issuances from the Americas had reduced slightly to 41%, increasing for Asia Pacific to 28% and dropping for EMEA to 31%.

Figure 4: Corporate bond issuance volume, US$



Source: Dealogic. Note: where (*) data annualized based on end-data September 2013 . Note: Emerging market aggregate figure based on Dealogic filter.

Corporate bond markets have also become more international in nature, with an increase in bonds offered on international markets; including specialized local issuance types such as Sukuk bonds which are being offered more widely (see Box 2).

Box 2: International markets and Sukuk issuances

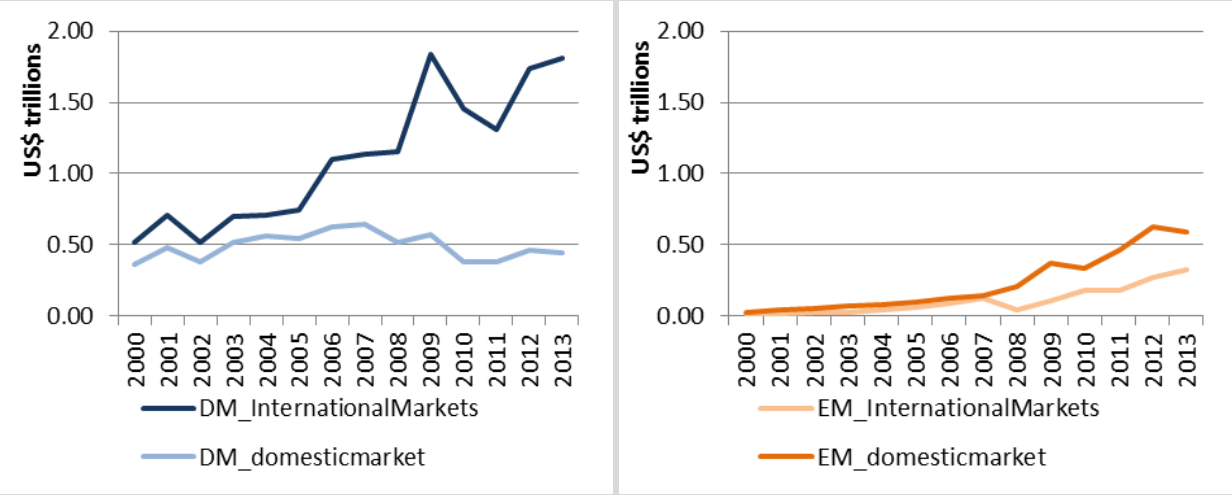
The financial system has become increasingly globalized over the last two decades. As described in this chapter, firms from both developed and emerging markets are issuing corporate debt. Increasingly, these issuances are being offered on international markets. Increasing internationalization of financial markets offers firms flexibility in accessing financing and tailoring the types of bonds they wish to offer to meet their needs.[43]

Figure 5 tracks the issuance of corporate bonds on international vs domestic markets for both firms in developed and in emerging economies. The data shows a clear increasing trend in international issuance for firms in developed markets reaching $1.8 trillion in 2013, while domestic issuances have reduced since the onset of the crisis. In emerging markets, both domestic and international market

[41] For certain DMs, bond issuance rebounded above pre-crisis levels e.g. UK corporate bond issuance in 2012 was recorded as the highest in 10 years.
[42] Data from Dealogic
[43] Juan Carlos Gozzi, Ross Levine, Maria Soledad Martinez Peria, Sergio L Schmukler, "How Firms Use Corporate Bond Markets under Financial Globalization", July 2013

issuances have been increasing, despite a drop in international market issuance in 2008. In 2013, international market issuance in emerging markets reached $320 billion.

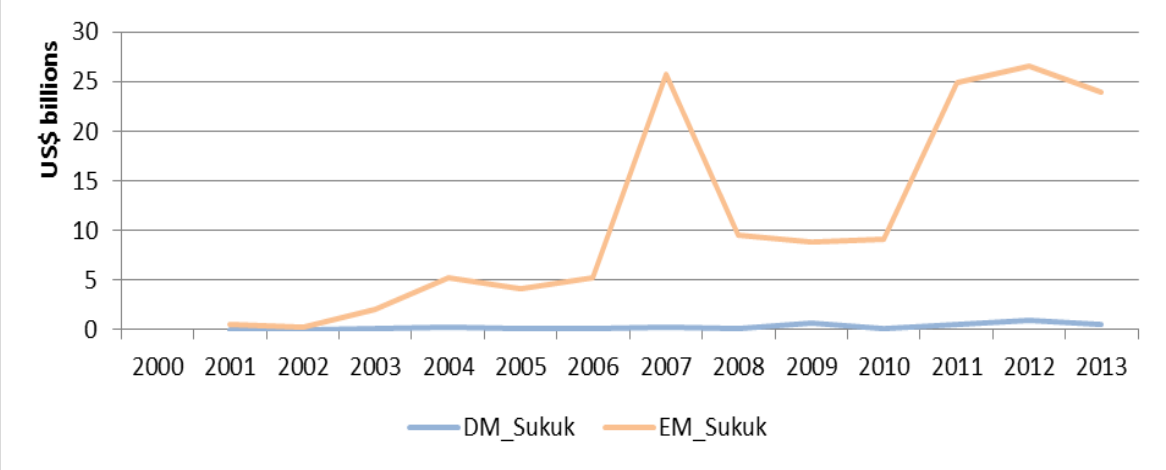
Figure 5: Bonds offered on international vs domestic only markets



Source: Dealogic; Note: DM (Developed Markets in sample and EM (Emerging markets in sample).

Furthermore, specialized local issuances such as Sukuk bonds are filtering into the global marketplace. Sukuk (or Islamic bonds) are structured to generate returns to investors without offering interest - unlike corporate bonds, investors part-own the underlying asset. Sukuk bonds allow Islamic investors to enter the corporate bond market in a way permissible under Sharia law. Figure 6 tracks Sukuk issuances in emerging and developed markets. Issuance in emerging markets reached $24 billion in 2013. In developed markets, issuance in 2013 reached $472 million in 2013, double 2007 levels. These developments, are a testament to the increasing access to and internationalization of corporate bond markets.

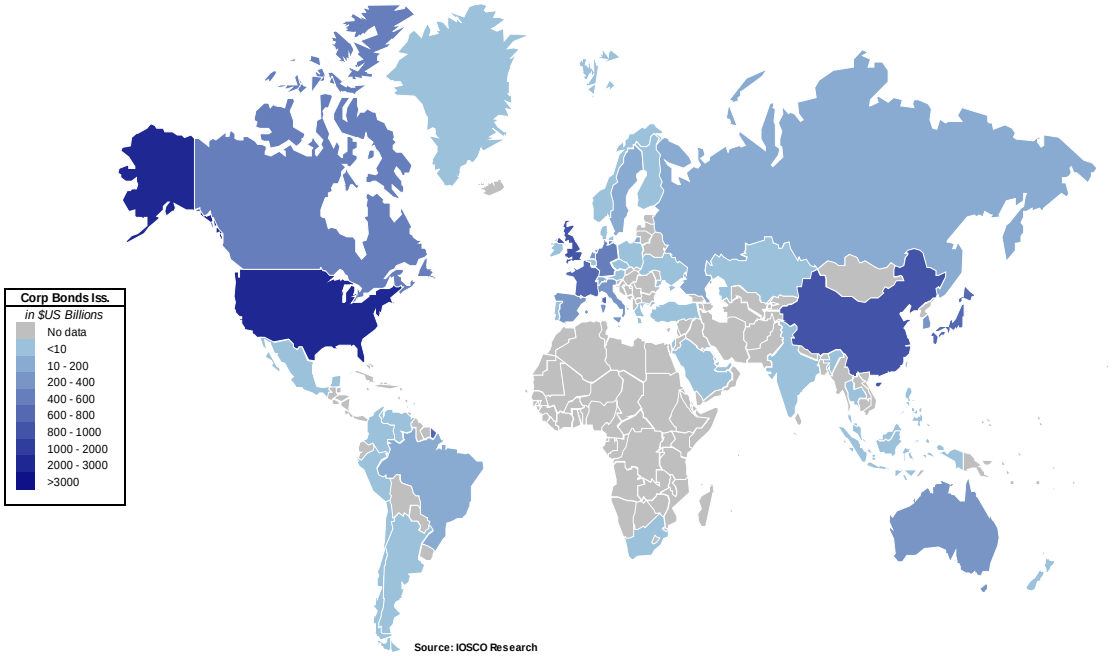
Figure 6: Sukuk issuances



Source: Dealogic; Note: DM (Developed Markets in sample and EM (Emerging markets in sample).

Nevertheless, the majority of corporate bonds issued between 2007 and 2013 have come from the largest economies (in terms of GDP). The majority of issuances in the post-crisis period have come from corporates domiciled in the United States, with $ 5.5 trillion issued since 2007. China experienced the second largest amount of issuance, with $ 1.5 trillion issued since 2007. The United Kingdom ranked third with $ 1.1 trillion in issuance for this period. Figure 7 provides a global heat map of total corporate bond issuance from 2007 to 30 September 2013.

Figure 7: Heat Map of Corporate Bond Total Issuance between 2007-2013



Source: IOSCO Research Department based on data from Dealogic Note: data extracted up to Sep 2013.

In relative terms however, countries with high corporate bond market issuance activity are not necessarily those with the largest economies.[44] Corporate bond issuance as a percentage of GDP can allow for relative comparisons of issuance activity between countries at varying levels of development and thus different economic sizes. Figure 8 presents rankings based on this indicator. Emerging markets have featured in the top 10 of this ranking since 2004. In fact, in 2013, Jamaica topped the rankings and South Korea ranked 5th. The United States, China and the United Kingdom (the three largest issuers since 2007) ranked 10th, 17th and 12th in that order.

[44] Largest in terms of GDP

Figure 8: Corporate bond market activity rankings

	2004 (% of GDP)		2007 (% of GDP)		2013 (March) (% of GDP)	
1	Iceland	32.38%	Iceland	39.37%	Jamaica	9.03%
2	Luxembourg	9.59%	Jamaica	11.83%	Luxembourg	8.69%
3	Kazakhstan	8.01%	Cyprus	9.83%	Sweden	6.25%
4	United Kingdom	6.19%	Kazakhstan	8.32%	Netherlands	6.16%
5	Malaysia	5.90%	Malaysia	7.03%	South Korea	5.73%
6	Netherlands	5.81%	Switzerland	6.85%	Canada	5.71%
7	Spain	5.79%	Netherlands	6.45%	Switzerland	5.28%
8	Singapore	5.77%	United States	6.17%	France	4.77%
9	Switzerland	5.48%	Portugal	5.87%	Hong Kong	4.66%
10	Ireland	5.46%	United Arab Emirates	5.83%	United States	4.57%
11	Australia	5.43%	Ireland	5.68%	Australia	4.53%
12	South Korea	5.07%	Spain	5.34%	United Kingdom	4.53%
13	United States	4.92%	Bahrain	5.27%	Thailand	4.39%
14	Italy	3.46%	United Kingdom	5.08%	Norway	3.96%
15	Germany	3.38%	Austria	5.00%	Chile	3.82%
16	Greece	3.33%	Luxembourg	4.98%	Ireland	3.63%
17	Austria	3.11%	South Korea	4.31%	China	3.51%
18	Sweden	2.90%	Greece	4.22%	Belgium	3.09%
19	Belgium	2.85%	New Zealand	4.13%	Russian Federation	2.96%
20	Norway	2.63%	Denmark	3.91%	Portugal	2.82%
21	Denmark	2.58%	France	3.83%	Iceland	2.78%
22	Canada	2.54%	Canada	3.67%	Peru	2.69%
23	Taiwan	2.52%	Russian Federation	3.64%	Malaysia	2.67%
24	Portugal	2.46%	Italy	3.54%	Spain	2.66%
25	Cyprus	2.44%	Sweden	3.47%	Germany	2.60%
26	France	2.40%	Trinidad and Tobago	3.45%	Finland	2.57%
27	United Arab Emi	2.33%	Venezuela	3.43%	United Arab Emirate	2.52%
28	Bahrain	2.23%	Australia	3.31%	Taiwan	2.50%
29	Slovenia	2.13%	Thailand	2.90%	Colombia	2.41%
30	Russian Federati	2.10%	Belgium	2.83%	Singapore	2.38%
31	Qatar	2.10%	Singapore	2.75%	Japan	2.32%
32	Chile	2.02%	Germany	2.68%	Bahrain	2.28%
33	Hong Kong	1.89%	Norway	2.39%	Italy	2.08%
34	Thailand	1.73%	Hong Kong	2.16%	Costa Rica	2.04%
35	Japan	1.41%	Japan	2.11%	Philippines	1.98%
36	Finland	1.37%	Saudi Arabia	1.73%	Sri Lanka	1.92%
37	Brazil	1.09%	Panama	1.58%	Kazakhstan	1.81%
38	India	1.04%	Dominican Republic	1.48%	Brazil	1.71%
39	Bulgaria	1.03%	Vietnam	1.44%	India	1.68%
40	Philippines	1.02%	Latvia	1.38%	Greece	1.57%
41	Oman	1.01%	South Africa	1.38%	New Zealand	1.54%
42	Lebanon	0.93%	Chile	1.36%	Azerbaijan	1.44%
43	Kuwait	0.84%	India	1.31%	Denmark	1.44%
44	Trinidad and Tob	0.75%	Colombia	1.28%	Qatar	1.36%
45	Indonesia	0.71%	Croatia	1.12%	Czech Republic	1.27%
46	Czech Republic	0.66%	Brazil	1.06%	Austria	1.26%
47	Slovak Republic	0.58%	Indonesia	0.99%	El Salvador	1.23%
48	China	0.52%	Taiwan	0.97%	South Africa	1.22%
49	Sri Lanka	0.48%	China	0.90%	Turkey	1.02%
50	Croatia	0.43%	Qatar	0.80%	Slovak Republic	1.00%
51	Egypt	0.41%	Czech Republic	0.78%	Indonesia	0.92%
52	South Africa	0.39%	Hungary	0.72%	Saudi Arabia	0.88%
53	Costa Rica	0.32%	Argentina	0.68%	Israel	0.73%
54	New Zealand	0.32%	Mexico	0.68%	Argentina	0.72%
55	Poland	0.30%	Ukraine	0.68%	Mexico	0.72%
56	Venezuela	0.22%	Finland	0.64%	Ukraine	0.72%
57	Israel	0.22%	Slovenia	0.62%	Estonia	0.63%
58	Argentina	0.13%	Philippines	0.62%	Oman	0.61%
59	Mexico	0.13%	Peru	0.55%	Lithuania	0.57%
60	Ukraine	0.13%	Kuwait	0.50%	Dominican Republic	0.56%
61	Turkey	0.10%	Pakistan	0.50%	Nigeria	0.40%
62	Saudi Arabia	0.07%	Nigeria	0.31%	Poland	0.36%
63	Latvia	0.07%	Azerbaijan	0.30%	Hungary	0.20%
64	Hungary	0.04%	Israel	0.27%	Kuwait	0.17%
			Poland	0.17%		
			Morocco	0.14%		
			Turkey	0.12%		
			Belarus	0.05%		

Source: Dealogic, IMF (GDP value for some countries past 2010, is a projection) Note: *Countries included on list are those with data. Note 2: Not all countries in the sample included in these rankings as some did not have issuances in 2004, 2007 or 2013.

3.3 Issuer and Issuance characteristics

A diverse issuer base – including non-financial and financial participants – is an important element of well-developed corporate bond markets.[45] Corporate bond markets can provide a stable source of funding for non-financials,[46] however financial issuances are also important, lubricating banks' ability to provide financial services to the economy, necessary for financial recovery. [47]

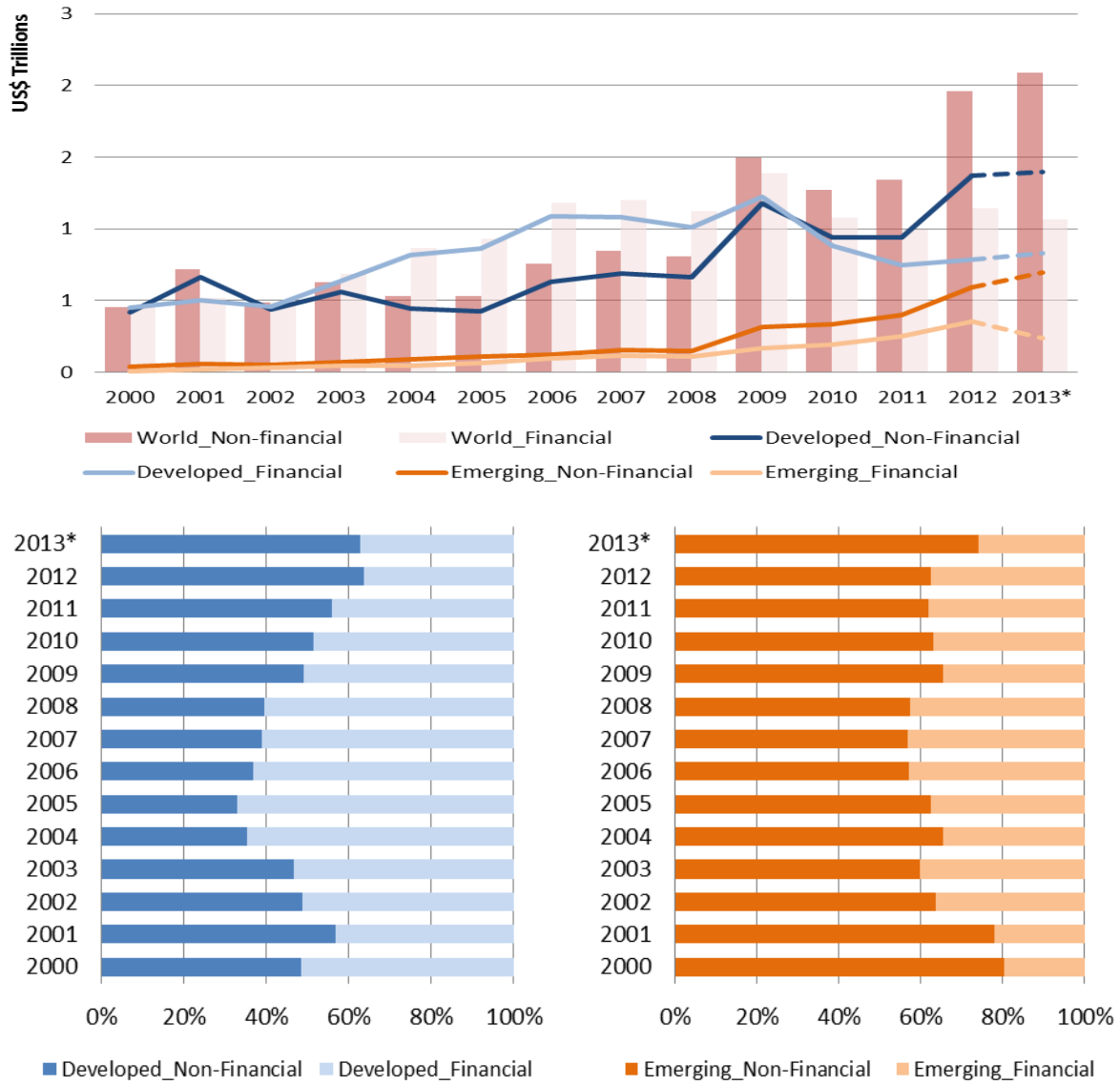
Reflecting trends in corporate bonds outstanding, issuances from non-financial firms have soared while issuances from financial firms have been subdued since the onset of the crisis. Figure 9 compares trends in corporate bond issuance from financial and non-financial firms. In 2000, financial issuance and non-financial issuance volumes sat at an almost 50/50 ratio. By 2007, financial issuances made up 59% of global issuances. However, between 2007 and 2013, financial issuances faced a downward trend (despite a peak in 2009), reducing from $1.2 trillion in 2007 to $1.1 trillion in 2013. In comparison, non-financial issuances more than doubled 2007 levels, reaching $2.1 trillion in 2013. Thus in 2013, around 66% of issuances came from non-financial firms.

The decreasing global issuance activity from financial firms is reflective of a changing issuer base in developed markets. Between 2000 and 2007, financial issuances in developed markets made up the majority proportion of total issuances (between 60% and 65%). However, after 2010, non-financial issuance volume exceeded financial issuance volume and by 2013, the ratio of financial to non-financials had well and truly flipped with financial issuances making up just 37% of developed market issuances. Financial issuances faced a downward trend between 2007 and 2013, declining by around 31% and reaching $827 billion in 2013. In contrast, non-financial issuances reached $1.4 trillion in 2013, almost double 2007 levels.

In emerging markets both financial and non-financial issuances have seen growth over the last decade, including after the onset of the crisis. In 2000, emerging market financial issuances made up just 20% of total emerging market issuances, increasing to 43% in 2007. Between 2007 and 2013, financial issuance more than doubled reaching $241 billion in 2013. However, non-financial issuances grew at a faster pace over this period, more than quadrupling 2007 levels to reach $692 billion in 2013. In 2013, financial issuances made up just 23% of total emerging market issuance volume.

[45] IMF, EBRD, OECD, "Local Currency Bond Markets – A Diagnostic Framework", July 2013:
[46] Economic Importance Corporate Bond Markets, ICMA, March 2013
[47] Economic Importance Corporate Bond Markets, ICMA, March 2013; See also IOSCO Securities Markets Risk Outlook 2013-14

Figure 9: Non-financial issues vs. financial issues



Source: Dealogic Note: 2013 figure is annualized based on data extracted end-September 2013.

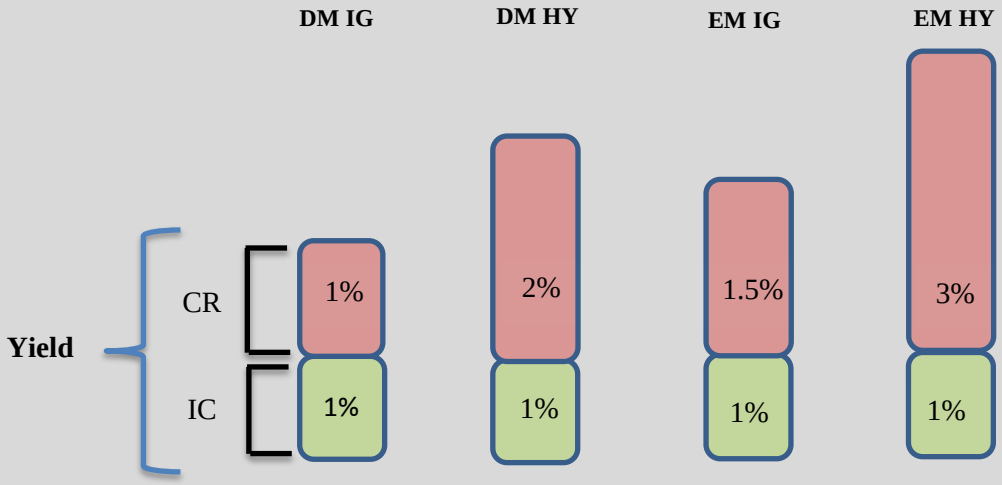
Financial and non-financial firms issuing corporate bonds can be broadly categorized as 'high yield' and 'investment grade' – depending on the risk of default associated with the issuing firm.[48] Growing high yield issuances may reflect an increased risk appetite and a search for yield. Historically, most issuances globally have been investment grade from developed markets. These issuances are considered the 'safest' issue class from an investor perspective but also offer the least yield (see Box 3).

Box 3: Corporate Bond Yield

Bond yields are made up of a number of components to reflect interest rate risk, default risk, call risk, liquidity risk and event risk (see *Chapter 4*). Default/Credit Risk (CR) and interest rate risk/ inflation compensation (IC) have traditionally been the major components of this yield. The CR component effectively compensates a bondholder for the risk of the issuing firm defaulting or being unable to pay yields and is dependent on a number of factors e.g. performance of the firm, stability of an economy/political system, health of the corporate sector etc. The IC is a reflection of real

[48] Investment grade issuances (IG) and high yield (HY) are classified differently depending on the credit rating agencies.

interest rates. In the example below, a developed market investment grade issue (DM IG) offers an IC of 1% and a CR of 1%; and a developed market high yield (DM HY) offers an IC of 1% and a CR of 2%. The higher CR is due to the risk of default being higher. For the emerging market investment grade (EM IG) issue the IC is also 1%, however the CR may be slightly higher if, for example, there is perceived political instability or markets are not as mature e.g. 1.5%. An emerging market high yield (EM HY) offer may also have an IC of 1%, however the CR may be 3% to compensate both for the risk of default due to a company's perceived performance and broader instability.



Source: IOSCO Research Department

Initially after the onset of the crisis, the default of a number of firms and uncertain economic conditions spurned interest in high-yield issuances. Since then, the low interest rate environment and low default rates have catalyzed a search for yield amongst investors, which has fuelled high yield markets (*see Chapter 4*). High yield issuances dropped initially with the outbreak of the crisis but have been rising since, above pre-crisis levels. A search for yield has generally been observed to be fuelling this issuance activity as sovereign issuances, bank deposits and money market funds offer little return on invested money.[49]

Figure 10 shows trends in high yield and investment grade issuances in both developed and emerging markets. In 2000, high yield issuances made up just 8% of total issuances, by 2013, high yield issuances made up 17% of total issuances reaching $550 billion (more than double 2007 levels). In comparison, growth in investment grade issuances has been flat overall since the onset of the crisis, peaking somewhat in 2009 and again in 2012/2013. Between 2007 and 2013, investment grade issuances grew by only 37% reaching $2.3 trillion. Nevertheless, investment grade issuances still made up the majority proportion (83%) of global issuances in 2013.

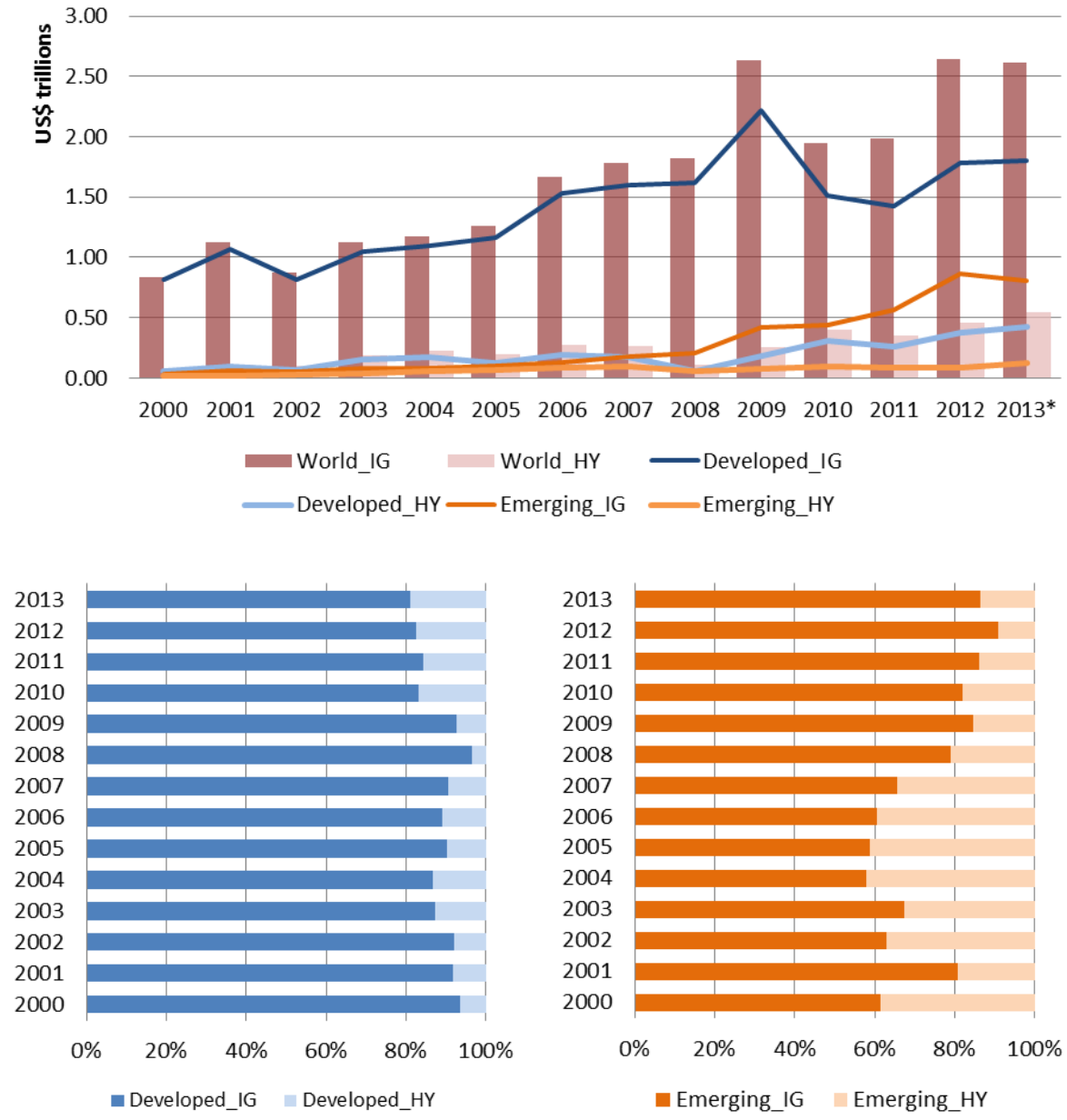
This trend is observable mostly in developed markets. In emerging markets, high yield issuances have decreased relative to investment grade since the onset of the crisis. In 2000, high yield issuances in developed markets made up just 6% of developed market issuances. In 2013, high yield issuances made up almost one fifth of total issuances (19%) and valued at $423 billion. In comparison, investment grade issuances in developed markets increased by only around 13% between 2007 and 2013, reaching $1.8 trillion.

In emerging markets, high yield issuances made up 38% and 39% of emerging market issuances in 2000 and 2007 respectively. Yet, by 2013, high yield issuances made up just 14%, reaching $126

[49] See Victoria Ivashina and Bo Becker, 'Reaching for Yield in the Bond Market', *Journal of Finance* (forthcoming)

billion. In comparison, investment grade issuances reached $800 billion in 2013, almost quintuple the size of 2007 issuance levels.

Figure 10: High yield vs. investment grade



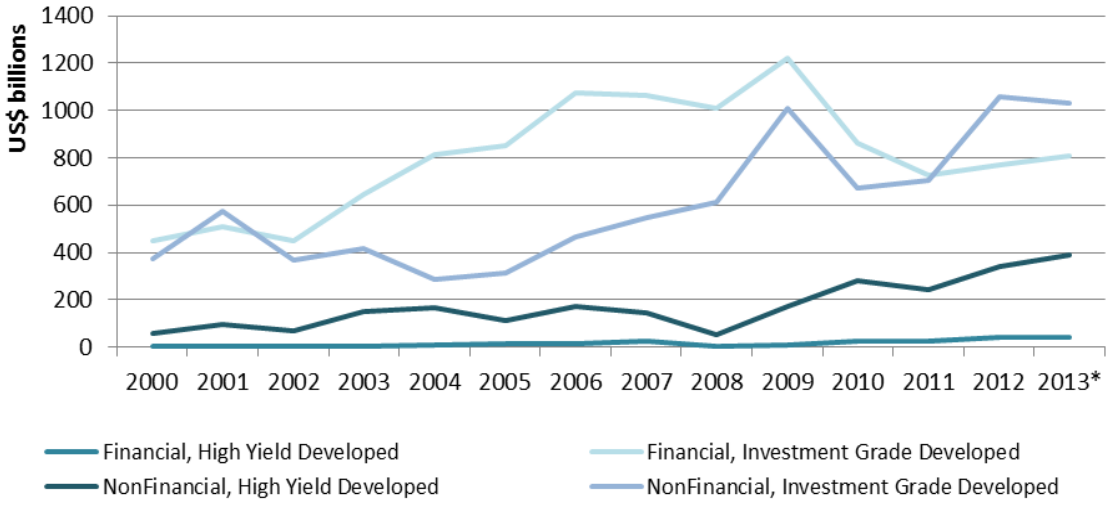
Source: Dealogic Note: *2013 figure is annualized based on data extracted end-September 2013.

The majority of high yield issuances from developed and emerging markets have come from non-financial firms. Figure 11 separates out the trend in high yield and investment grade for financial and non-financial firms. In developed and emerging markets, most high yield issuances have come from non-financial firms, with issuance volume reaching $390 billion in developed markets and $102 billion in emerging markets in 2013. This increasing high yield issuance is occurring in the context of soaring investment grade issuances in both developed and emerging markets (non-financial investment grade issuances reached $1 trillion in developed markets and $584 billion in emerging markets). In developed markets, investment grade issuances from non-financial firms overtook investment grade issuances from financial firms in 2011.

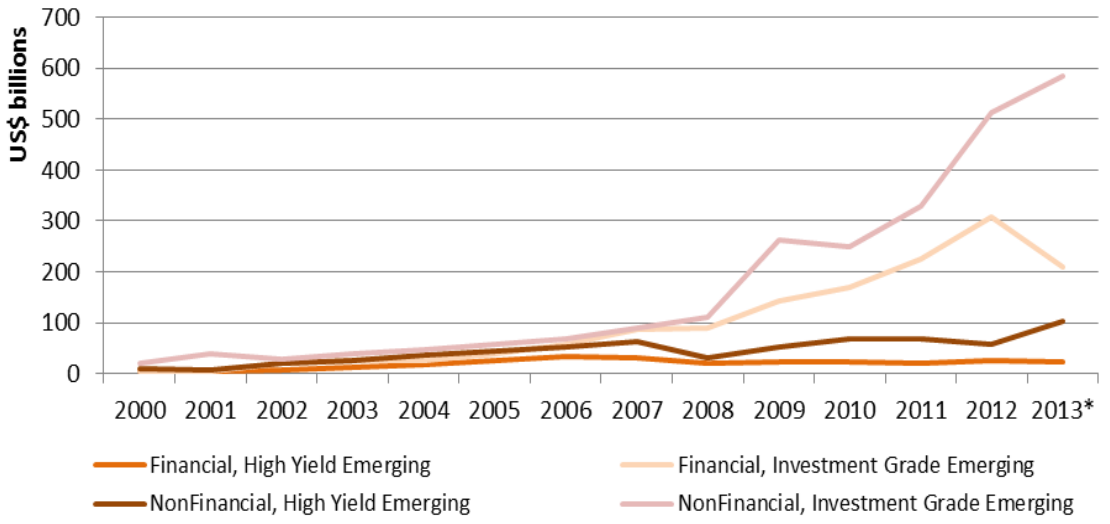
High yield issuances from financial firms in developed markets have also been increasing, while in emerging markets such issuances have been decreasing. In developed markets, high yield issuances from financial firms have increased since 2007 by almost 70% to $39 billion in 2013. While a relatively small volume of issuance, this should be viewed in the context of declining investment grade issuances from financial firms, which dropped by almost 30% between 2009 and 2013, reaching $809 billion. In emerging markets, investment grade issuances from financial firms have been on a strong upward trend (despite a reduction in 2013). In contrast, high yield issuances from financial firms have faced a declining trend since the onset of the crisis reaching $24 billion in 2013.

Figure 11: High yield vs. investment grade for non-financial and financial corporations

Developed Markets



Emerging Markets



Source: Dealogic Note: *2013 figure is annualized based on data extracted end-September 2013.

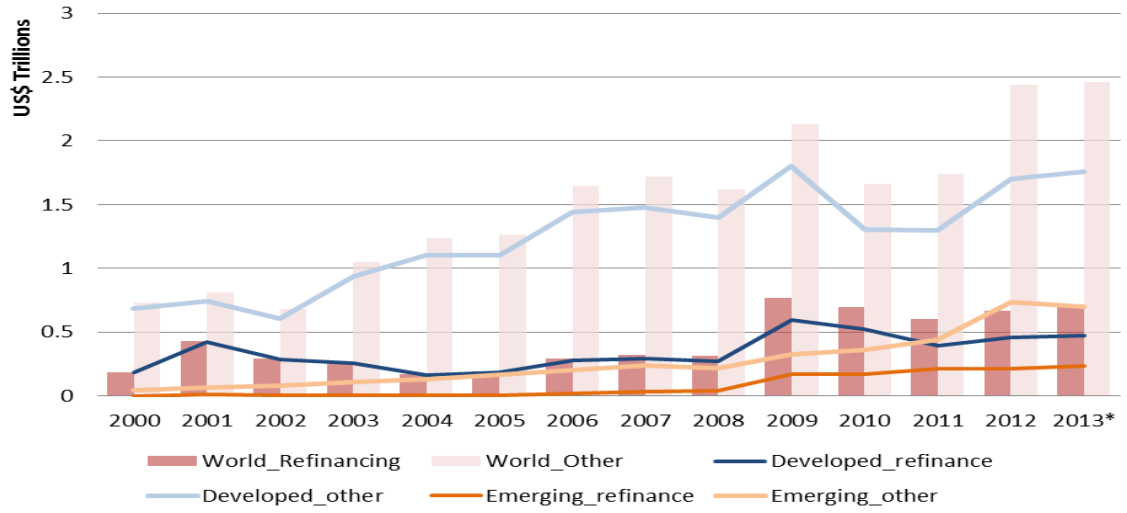
The proceeds of these issued bonds can be used for productive purposes or for refinancing. Productive activities can include project financing, supporting expansion and selling products and services to the real economy. When bonds are issued for refinancing and similar purposes (*hereafter refinancing issuances*) this means that they are being used to repay, replace or restructure existing debt. Corporates may be incentivized to issue bonds for refinancing purposes when new economic conditions lower the cost of borrowing. In this way, bonds issued for refinancing substitute

previously issued bonds offering higher yields (more cost), with new bonds offering lower yields (less cost).

Most issuances since 2000 have been for productive purposes. However, the low interest rate environment following the outbreak of the crisis led to a small jump in refinancing issuances. Figure 12 compares refinancing issuances with productive (other) issuances in developed and emerging markets. In 2000, refinancing issuances made up 20% of total issuances. Refinancing issuances remained relatively flat until the onset of the crisis. Between 2007 and 2013, issuance volumes doubled reaching $704 billion in 2013. In particular, refinancing issuances saw a jump in 2009, in line with the first round of the US Federal Reserve's and Bank of England's quantitative easing/asset purchasing programs which worked to drive down interest rates (In November 2008 and September 2009 respectively). Since then growth has been flat.

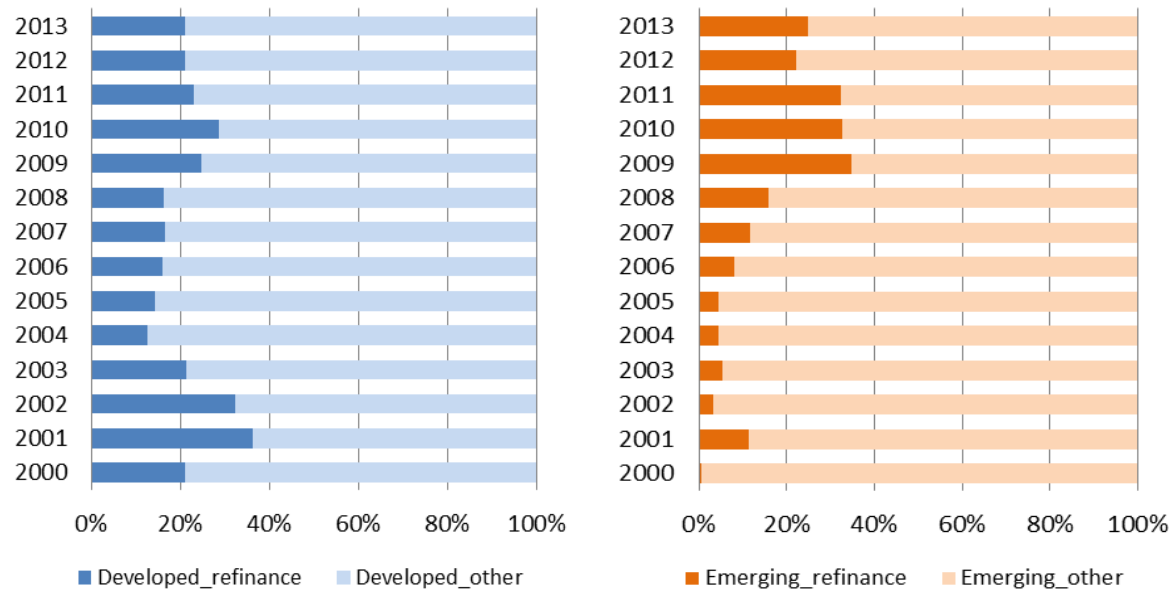
In emerging markets, refinancing issuances were small before the crisis but have since increased dramatically. In developed markets, trends in refinancing were reflective of the global trend.[50] However in emerging markets, the surge in refinancing issuances is more pronounced. This is because before the crisis, refinancing issuances were very small – in 2000 refinancing issuance volume was $9 billion and made up just 11% of emerging market issuances. By 2007, refinancing issuances had increased to $32 billion and made up 12% of total issuances. After the onset of the crisis, refinancing issuances in emerging markets jumped reaching $233 billion in 2013 and making up one quarter of emerging market issuances. During this period, other issuances also increased, steeply in 2011/2012.

Figure 12: Issuance for refinancing (and similar) purposes



(Continued on next page)

[50] In developed markets, refinancing issuances made up 21% of total developed market issuances in both 2000 and 2013 (16% in 2007). Issuances in 2013 reached $470 billion. For non-refinancing issuances, total issuances valued at $1.8 trillion in 2013, a 20% increase on 2007 levels.

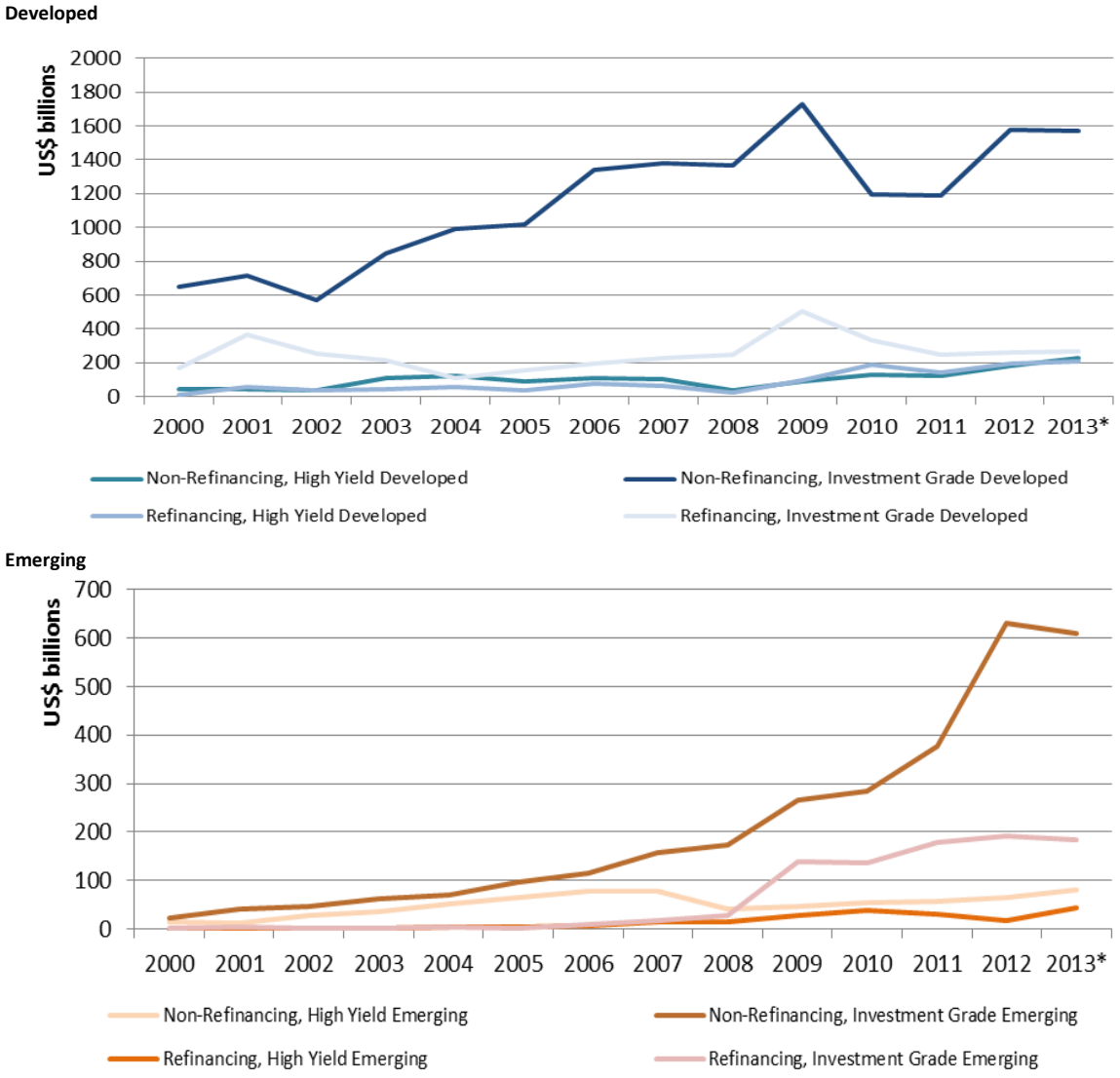


Source: Dealogic Note: 2013 figure is annualized based on data extracted to 30 September 2013.

High yield firms in particular are turning to the bond markets for refinancing purposes. Figure 13 separates out the trend in refinancing issuances for both the high yield and investment grade market. In developed markets, high yield refinancing issuances have almost tripled 2007 levels, reaching $206 billion in 2013. In fact, in 2013 almost half (44%) of all refinancing issuances came from high yield firms – compared to just a quarter of refinancing issuances coming from high yield firms in 2007. Investment grade refinancing issuances also peaked in 2009, however growth has been relatively flat since 2007. In 2013, refinancing issuances from investment grade firms reached $269 billion.

In emerging markets, refinancing issuances have come mostly from investment grade firms. Refinancing issuance from high yield firms have also increased slightly, however they have made up a decreasing proportion of refinancing issuances since the onset of the crisis. In 2007, refinancing issuances from high yield firms made up 48% of refinancing issuances in emerging markets. As the crisis spread, refinancing issuances from investment grade firms jumped and have since grown steadily reaching $183 billion in 2013. In comparison, refinancing issuance volumes from high yield firms decreased between 2010 and 2012, reaching just $45 billion in 2013. The consequence of these trends is that in 2013, high yield refinancing issuances made up just 20% of total refinancing issuances.

Figure 13: Refinancing issuances by high-yield and investment grade issuers



Source: Dealogic Note: 2013 figure is annualized based on data extracted to 30 September 2013.

The international nature of corporate bond markets means that firms can choose to issue corporate bonds in either local or non-local currency (a Eurobond).[51] Active local currency bond markets can assist economies in weathering financial crises and reversals of capital flows (e.g. brought on by a hike in interest rates).[52] This is because, from an issuer's perspective, local currency bonds are more stable while a Eurobond holds foreign exchange risk. For example, if a non-US corporation issues debt in US dollars and the value of their local currency decreases against the US dollar, the firm is still expected to pay back the principal in US dollar terms – which would require more local currency to do. From a foreign investor perspective however, it is the local currency bond markets that hold foreign exchange risk. For example, a US investor purchasing non-US local currency bonds will see the value of their bond and principal decline if the US dollar rises against the local currency.

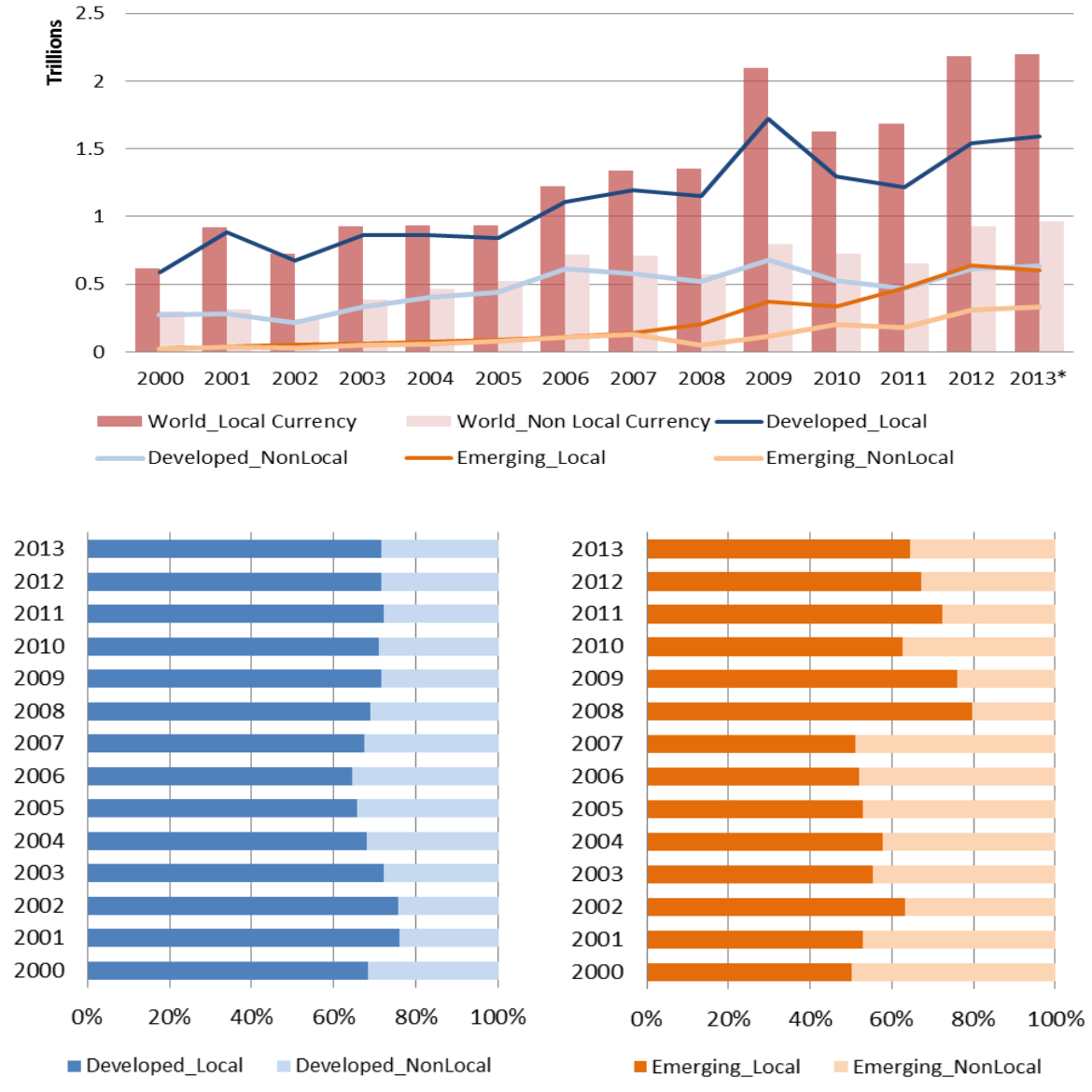
The majority of issuances globally have tended to be in local-currency, even more so after the onset of the crisis when Eurobond markets faced relatively flat growth. Figure 14 compares local

[51] A Eurobond is any international bond denominated in any foreign currency. A Eurobond is different from 'Eurobonds' or 'Euro-denominated bonds' which are government issuances denominated in Euros.
[52] IMF, EBRD, OECD, "Local Currency Bond Markets – A Diagnostic Framework", July 2013

and non-local currency issuances for developed and emerging markets. It shows that local currency issuances have been making up an increasing proportion of total issuances since the onset of the crisis. In 2007, local currency issuances made up 65% of total issuances and by 2013 they made up 70%, reaching $2.2 trillion, doubling 2007 levels. Meanwhile, during the same period, non-local currency issuances grew at a slower rate, reaching $963 billion in 2013, an increase of 36% on 2007 levels.

While this global trend is reflected in developed markets, local and non-local bond issuances in emerging markets have behaved somewhat differently. From 2000 to 2007, the ratio of local currency to non-local currency issuances was roughly 50/50 in emerging markets. After the onset of the crisis, non-local currency issuances declined to a low of $53 billion in 2008. Since then, non-local currency issuances have been on an upward trend reaching $331 billion in 2013. Nevertheless, local currency issuances have grown at a faster rate since the onset of the crisis. In 2013, local currency issuances reached $603 billion making up 65% of emerging market issuances.

Figure 14: Local currency vs. non-local currency issuance



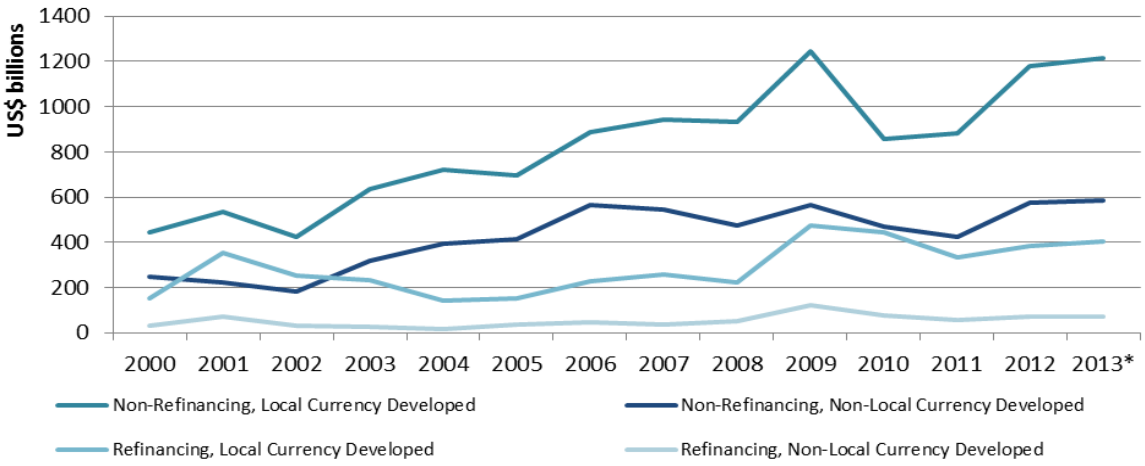
Source: Dealogic Note:* 2013 figure is annualized based on data extracted 30 September 2013.

In developed markets, firms tap into foreign bond markets predominantly to finance productive activities, rather than for refinancing. Figure 15 disaggregates local and non-local currency issuances by use of proceeds. Over the last decade, non-local currency issuances have predominantly been for non-refinancing purposes in developed markets. This did not change after the onset of the crisis. Non-local currency issuances for refinancing purposes reached just $71 billion in 2013, while local currency issuances for refinancing purposes jumped in 2009, reaching around $404 billion in 2013. Nevertheless, there has been a proportional increase in the amount of non-local currency issuances for refinancing purposes. In 2007, refinancing issuances made up just 6% of non-local currency issuances and by 2013, refinancing issuances made up 11% of non-local currency issuances.

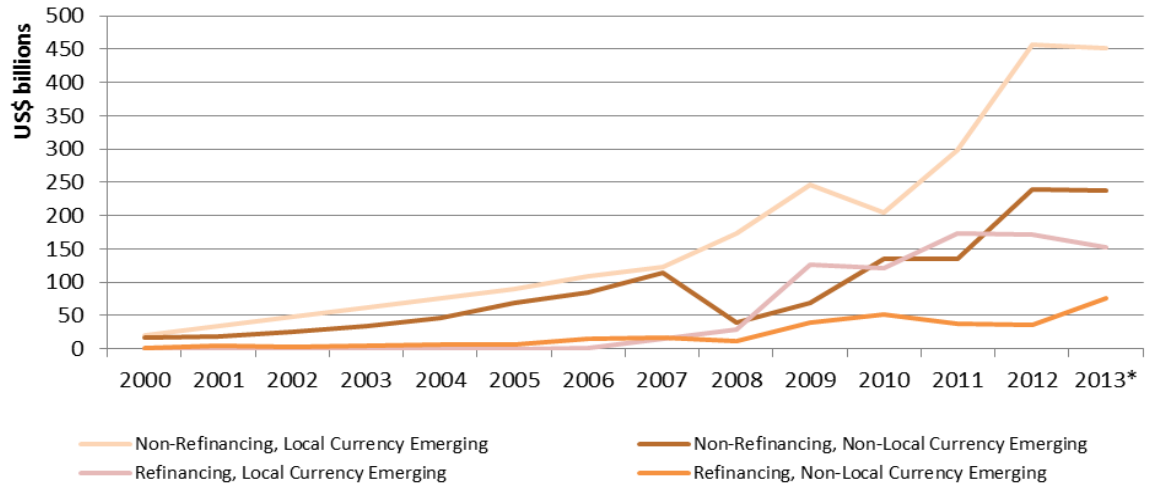
In emerging markets, the majority of foreign currency issuances have also been for productive purposes. However the data suggests that emerging market firms are increasingly turning to foreign bond markets to refinance their debt. Non-local currency issuances for productive purposes reached $238 billion in 2013. Meanwhile non-local currency issuances for refinancing purposes reached $75 billion in 2013, higher than in developed markets. In 2007, refinancing issuances made up 13% of non-local currency issuances. By 2013, refinancing issuances made up almost a quarter of non-local currency issuances.

Figure 15: Local vs non-local currency for refinancing purposes

Developed



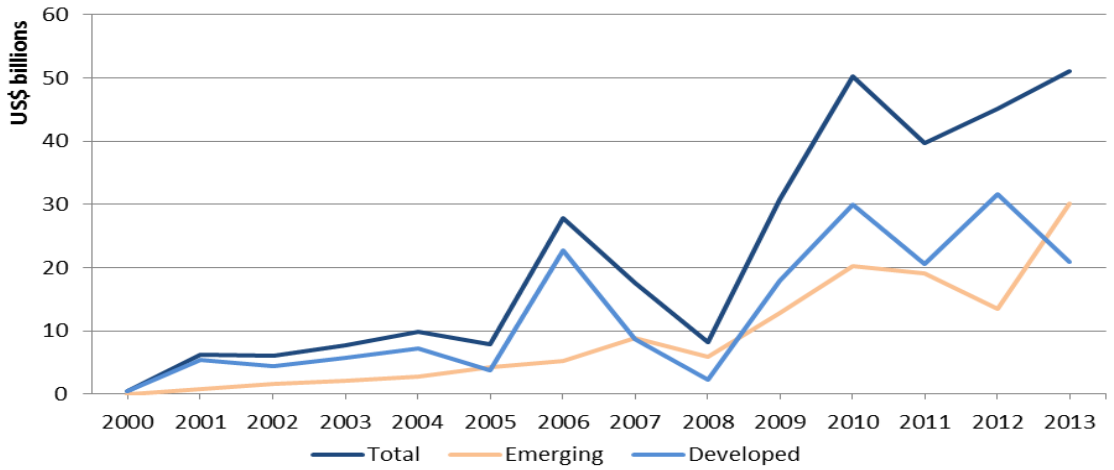
Emerging



Source: Dealogic Note: 2013 figure is annualized based on data extracted to 30 September 2013.

In general, high yielding classes of fixed income have increased but make up a small proportion of total issuances. Figure 18 zeroes in on High yield, Eurobond issuances for refinancing purposes. These bonds hold more risk as issuers are more susceptible to default (high yield), foreign exchange risk (non-local currency) and rollover risk (refinancing issuances), if interest rates were to rise and economic conditions change. In 2013, these issuances reached just $51 billion in 2013 (tripling 2007 levels). In 2013, the majority of these issuances came from emerging markets, reaching $30 billion compared to $21 billion in developed markets. While still small (making up just 2% of total issuances in 2013), growth in this market suggests a search for yield in the post-crisis environment.

Figure 16: High yield, Eurobond issuances for refinancing purposes from non-financial corporations.



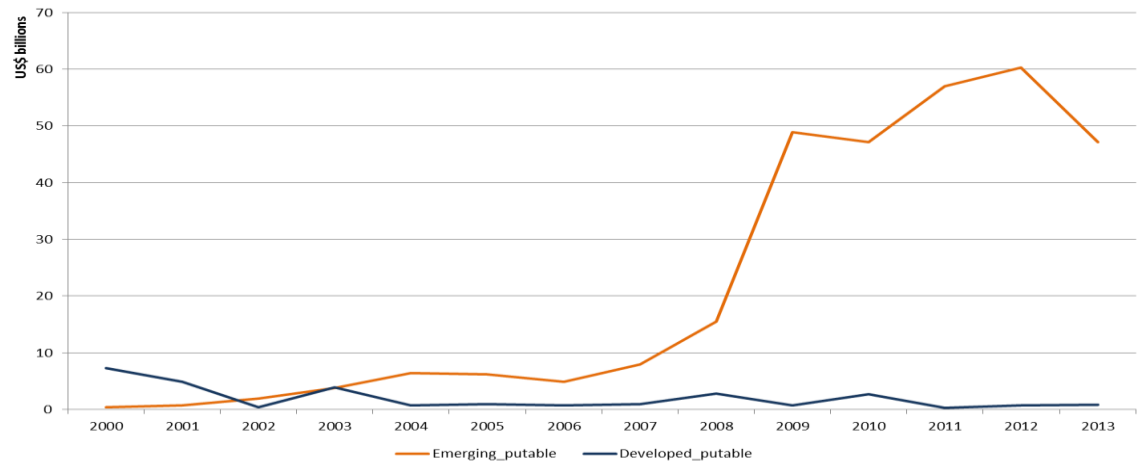
Source: Dealogic Note: 2013 figure is annualized based on data extracted to 30 September 2013

Also of interest, in emerging markets, puttable bond issuances have soared since the onset of the crisis, with potential implications for corporate financing. A puttable bond involves a 'put option' embedded into a bond. This option allows a holder of the bond to ask for early repayment of the principal, depending on specified 'put' dates. The yield offered on a puttable bond is lower than a non-puttable bond. This is because an investor can offset the interest rate risk inherent in bonds (*see Chapter 4*) through utilizing the put option.[53] Figure 17 shows that in developed markets puttable bond issuance has been decreasing, reaching just $1 billion in 2013. However, in emerging markets, issuance of puttable bonds soared in 2009, reaching $47 billion in 2013.

In 2013, puttable bonds made up just 5% of emerging market bond issuances, however the surge of issuances post-crisis could be a topic for monitoring and continued research. Puttable bonds offer a cheaper source of financing for corporates, due to the lower yields offered. However, they also can lead to uncertainty around future cash flows from the issuer's perspective. From a long-term financing perspective, an increase in puttable bonds could mean more volatility in corporate funding, especially as interest rates rise in the developed world.

[53] Gary Strumeyer, Investing in Fixed Income Securities: Understanding the Bond Market, 2005

Figure 17: Puttable bond issuance



Source: Dealogic Note: data extracted end 2013.

3.4 Maturity and Term-length

Corporate bonds can be issued for the short (less than a year), medium (between 1 and 5 years) and long term (greater than 5 years). The term refers to the length of time from issuance, before the bond matures and the principal is paid back to the investor. The average term of issuances can also impact the rollover or refinancing risk[54] from an issuer perspective and the sensitivity of bond prices to changes in interest rates and general economic conditions, from an investor perspective.[55] Longer-term bonds tend to offer higher yields to compensate investors for increased price volatility.

After the onset of the crisis, the long-term interest rate fell as central banks around the world put into place asset purchasing and quantitative easing programs to bring down the short-term (policy) interest rate. The lower interest rate environment reduced the cost of borrowing for firms issuing bonds (since the yield needing to be paid to investors for these bonds reduced) (*see Chapter 4 for further discussion*). In May 2013, the US Federal Reserve announced its plan to unwind these policies with a subsequent increase to the interest rate on generic 10 year treasury bonds. Firms that issued a large proportion of shorter-term debt during the post-crisis period are more vulnerable to changes in economic conditions such as this interest rate hikes.[56] On the other hand, investors who purchased longer-term bonds during this period are more vulnerable to interest rate hikes, especially if they plan to sell their bond on a secondary market.[57]

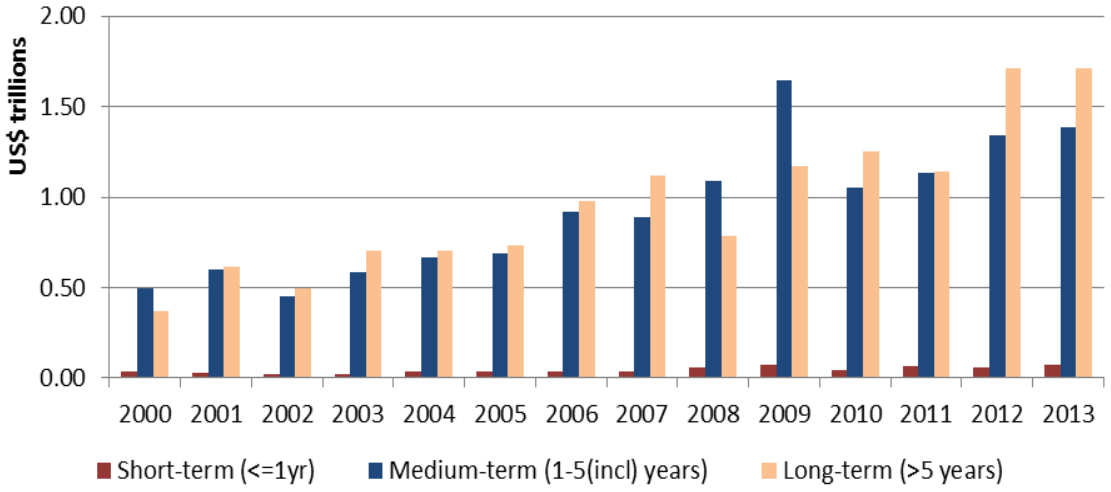
Over the last 13 years, corporate bond issuance terms have continued to be generally long or medium term. This profile stayed true even with the onset of the crisis and the subsequent low interest rate environment. Figure 18 presents the proportion of corporate bonds issued over the last decade, that are short-term, medium-term and long-term. In 2000, medium-term issuances

[54] Patricio Valenzuela, "Rollover Risk and Corporate Bond Spreads", September 2011, European University Institute
[55] Gopalan, Radhakrishnan, Febghua Song, and Vijay Yerramilli, , 'Debt maturity structure and credit quality', Olin Business School working paper, 2010
[56] He, Zhiguo, and Wei Xiong, 'Rollover risk and credit risk', Working Paper 15653, NBER, 2010
[57] The longer the maturity period of the bond, the more likely it will be affected by this price volatility. Longer-term bonds tend to offer higher yields to compensate. However, if bondholders plan to hold a bond till maturity the 'value' of the bond is inconsequential – the bondholder will receive the whole face value back at maturity (unless default occurs). The 'value' of the bond only really matters if one needs to sell the bond before maturity since the price you can get for it on the secondary market depends on the 'value' of the bond.

made up 55% of total issuances, long-term issuances made up 41% and short term issuances made up 4%. This ratio has not changed significantly.

Nevertheless, short-term issuances have been increasing since the onset of the crisis even though these issuances still make up a tiny proportion of total issuances. Short-term issuances have been growing strongly compared to pre-crisis levels. Between 2000 and 2007, the CAGR of short-term issuances was -0.1%. After the onset of the crisis, between 2007 and 2013, the CAGR rose to 11%.[58] Nevertheless, by 2013, the volume of long-term issuances was $1.3 trillion (54% of total issuances); the volume of medium term issuances reached $1 trillion (44%); and the volume of short-term issuances was just $54 billion (2%).

Figure 18: Maturity term of corporate bond issuances

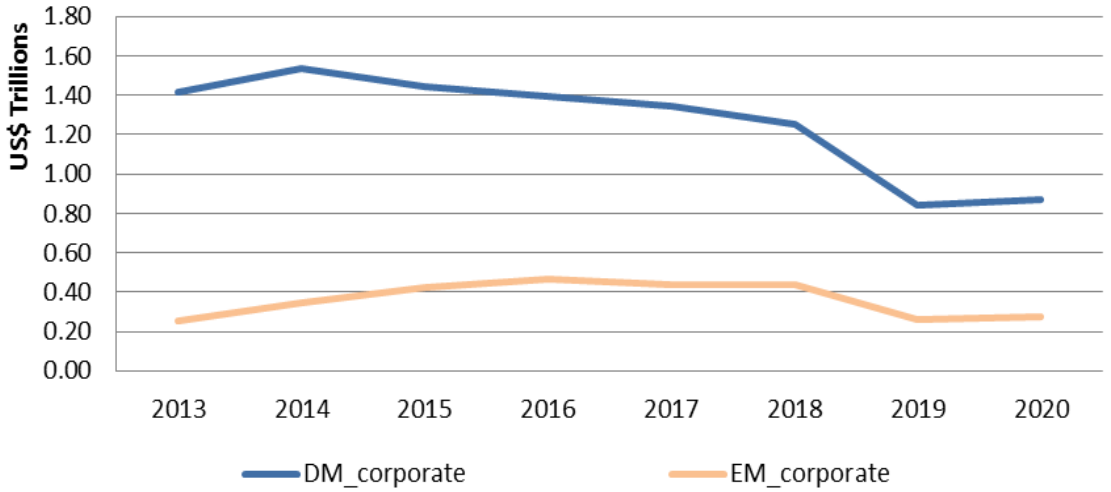


Source: Dealogic, Issuance Note: 2013 figure annualized based on end Sep data. Note: Does not include perpetual.

In the next few years, as interest rates are expected to rise, trillions worth of corporate debt is due to mature. According to Figure 19 in the next 7 years (2014-2020) around $11.3 trillion of corporate debt is due to mature. $8.7 trillion of this will come from developed markets and $2.6 trillion of this will come from emerging markets. In 2014 alone, $1.5 trillion of developed market corporate debt and $0.3 Trillion of emerging market corporate debt will mature. The maturity schedule peaks for developed markets in 2014 and 2016 for emerging markets.

[58] The CAGR of long-term issuances was 6% and for medium-term issuances it was 7%

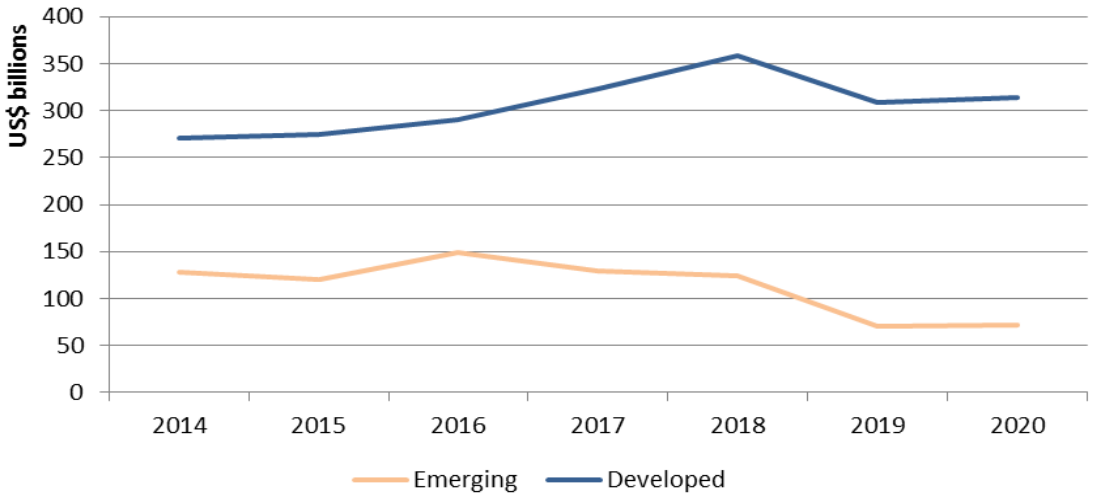
Figure 19: Maturity schedule – Corporate bonds



Source: Dealogic; Note: as of September 2013; Note: DM (Developed Markets in sample and EM (Emerging markets in sample).

The maturity schedule is somewhat different for refinancing issuances, peaking in 2016 in emerging markets and 2018 in developed markets. Figure 20 shows the maturity schedule for bonds issued only for refinancing purposes. In the next seven years, almost $3 trillion worth of refinancing issuances will mature - $790 billion in emerging markets and $2.1 billion in developed markets. In the next two years, during a period in which interest rates are anticipated to rise, around $794 billion worth of refinancing issuances will ($248 billion in emerging markets and $546 billion in developed markets). The maturity schedule for refinancing issuances peaks in 2018 for developed markets, reaching $359 billion. For emerging markets, the maturity schedule slopes downward after a peak in 2016 ($150 billion). In the medium-term, firms with a large amount of debt maturing may find it more difficult to refinance as the costs of borrowing increase, this is especially pertinent for high yield firms and this 'maturity wall' may negatively impact the default rate (*see Chapter 4*).

Figure 20: Maturity schedule – Refinancing Corporate bonds



Source: Dealogic; Note: as of September 2013

❑ Chapter 4 – Understanding bond risks in a changing interest rate environment

Corporate bonds carry risks for investors that are mostly priced into the offered bond yield. The current low interest rate environment is inflating demand for products that offer some yield above the inflation rate (a search for yield), leading to movement into higher yielding products.[59] This can be seen by an increase in high yield issuances, CoCo issuances and PIK issuances in developed markets.

The previous chapter identified some risks to consider from an investor perspective, including foreign exchange risk for foreign investors in local currency bond markets and increased volatility in price for bonds held over the longer-term. This chapter investigates other risks associated with bonds include default risk, call risk, liquidity risk and interest rate risk.

4.1 Search for Yield

In both advanced and emerging markets, [60] **accommodative monetary policies have been put in place to stimulate growth and recovery in the wake of the financial crisis.** After the crisis first broke out, governments in developed markets chose to bail-out a number of failing financial institutions, in order to limit the systemic impact on the economy. Governments also put in place stimulus policies to foster continued economic growth. However, to finance such spending policies, governments are forced to issue more government debt (government bonds). An excess of government debt can push up yields and crowd out financing opportunities for corporates. Asset purchasing programs employed by the central bank can absorb a percentage of government debt issuances, in order to keep interest rates low and thus encourage risk-taking. [61] Furthermore, quantitative easing can be employed to buy up private financial assets, in order to lower the yield on those assets. These programs also allow central banks to remove duration[62] from the market by purchasing long-term securities and thereby lowering long-term yields. [63]

Thus, in developed markets in particular, quantitative easing and asset purchasing programs are undertaken by central banks (see Annex B) in order to (1) finance government spending during the crisis, due to bail-outs and stimulus policies (2) support banks in their recovery and (3) encourage risk taking e.g. through investment in corporate debt and equity, a necessary element of long-term investment. [64]

As a consequence of these policies, nominal interest rates[65] have neared zero and sometimes negative bounds. Zero or negative real interest rates are an anomaly. Theoretically, in a growth-

[59] See IOSCO Securities Markets Risk Outlook, 2013-2014 [www.iosco.org/research]
[60] Including the central banks of the United States, United Kingdom, Japan, Brazil, China, Columbia, Czech Republic, Israel, Korea, the Philippines and South Africa lowered policy rates.
[61] 'Search for yield as rates drop further', BIS Quarterly Review, September 2012
[62] Duration refers to the sensitivity of the price of a bond to changes in interest rates. The longer the duration of a bond, the more exposed the bond is to changing interest rate conditions and thus volatile prices. As such, longer duration bonds offer higher yields to compensate investors. By purchasing longer-term securities, central banks can reduce the supply of longer-term securities, compared to the demand. As such, issuing firms do not have to compete by offering higher yields to investors.
[63] 'Search for yield as rates drop further', BIS Quarterly Review, September 2012
[64] Adrian Blundell-Wignall and Caroline Roulet, "Long-term investment, the cost of capital and the dividend and buyback puzzle', *OECD Journal: Financial Market Trends*, 2013; Belke, A. and T. Polleit, Monetary economics in globalised financial markets, Springer, 2010
[65] The nominal interest rate is the real interest rate minus inflation. rates were also negative after WW II and in the 70s – due to high rates of inflation.

based economy, the current 'value' of money is always higher than the 'future' value of money, which is why interest is paid on money that is locked up till a future date. The consequence of this is a compression of term and risk premium. [66] From an investor/saver perspective, safe assets such as government securities and bank deposits offer little return. Furthermore, some money market funds are no longer accepting new investments since they can no longer offer positive returns. [67]

As such, investors are increasingly searching for yield. As financial institutions deleverage in the wake of the crisis, risk-taking investors are being transferred to the non-financial corporate debt markets. This is because investors are looking for some 'reasonably safe' investments that still offer some yield.

As *Chapter 3* describes, high yield issuances, while still relatively small compared to investment grade, have been on a clear upward trend in developed markets.[68] High yield bond funds and emerging market bond funds have attracted large inflows, inflows into emerging markets in general have spiked and corporate bond spreads have fallen as investors pile into the market. [69] In addition, corporate bond markets have seen the fast rise of new, high yielding forms of corporate bonds such as contingent capital and payment-in-kind bonds (See Box 4). These types of bond issuances offer relatively high yields but at significant risk. While still making up a small proportion of the corporate bond universe, the increasing popularity of these issuances confirms a search for yield.

Pension funds and insurance funds in particular are spurred into riskier investment.[70] For these types of funds, falling bond yields reduce the discount rate used to determine the present value of future liabilities – potentially causing a profit squeeze. As such, these funds find themselves investing in higher-yielding (and thus higher risk) securities in order to pay out to their investors at the promised level. [71] One study also suggests that in a low interest rate environment, smaller financial institutions also partake in this search for yield, while foreign financial institutions and larger domestic financial institutions either lower risk or do not change their risk exposure. [72]

Box 4: Contingent Capital and payment-in-kind bonds

Contingent capital is a hybrid bond, which was spawned in large part by the new regulatory environment in the wake of the crisis. Contingent capital can include Contingent Convertible Bonds (CoCos) and 'Write-down' bonds. A recent report by the BIS[73] outlines the structure of Contingent Capital issuances and notes that their recent growth is attributable to Basel III rules which allows such bonds to be treated as Additional Tier 1 or Tier 2 capital. The issuance of Contingent Capital can provide financial institutions with an option for reducing debt and increasing capitalization, in periods of distress. As such, Contingent Capital aims to reduce the moral hazard associated with governments stepping in to inject capital into a failing financial institution as private investors step

[66] Adrian Blundell-Wignall and Caroline Roulet, "Long-term investment, the cost of capital and the dividend and buyback puzzle', *OECD Journal: Financial Market Trends*, Volume 2013, Iss I

[67] See 'Search for yield as rates drop further', BIS Quarterly Review, September 2012

[68] There is evidence that some low quality issues are being oversubscribed adn that in the post-crisis period high yield bonds in the US offered less yield than equities in the S&P 500 – for the first time in history; see Adrian Blundell-Wignall and Caroline Roulet, "Long-term investment, the cost of capital and the dividend and buyback puzzle', *OECD Journal: Financial Market Trends*, Volume 2013, Iss I

[69] See Belke, A. and T. Polleit (2010a): Monetary economics in globalised financial markets, Springer; 'Search for yield as rates drop further', BIS Quarterly Review, September 2012

[70] See IOSCO Securities Markets Risk Outlook 2013-2014, 2013 [www.iosco.org/research]

[71] Antolin, P., Schich, S. and J. Yermo, 'The economic impact of protracted low interest rates on pension funds and insurance companies', OECD Journal: Financial Market Trends, 2011

[72] Claudia Buch, Sandra Eickmeier, Esteban Prieto, "In Search for yield? Survey-based evidence on bank risk taking", *Deutsche Bundesbank*, Discussion Paper, Series 1: Economic Studies, No 10, 2011

[73] Stefan Avdijiev, Anastasia Kartasheva, Bilyana Bogdanova, 'CoCos: a primer', in BIS Quarterly Review, September 2013

back (i.e. the too big to fail issue).

To fulfil this promise, Contingent Capital has a trigger level and loss absorption mechanism. The trigger is the threshold value(s) defined by a particular capital ratio or, in some cases, supervisory discretion, which activates this loss absorption mechanism. For CoCos, the loss absorption mechanism works by converting debt into equity. For write-down bonds, the loss absorption mechanism works by imposing a full or partial write down on the principal owed.

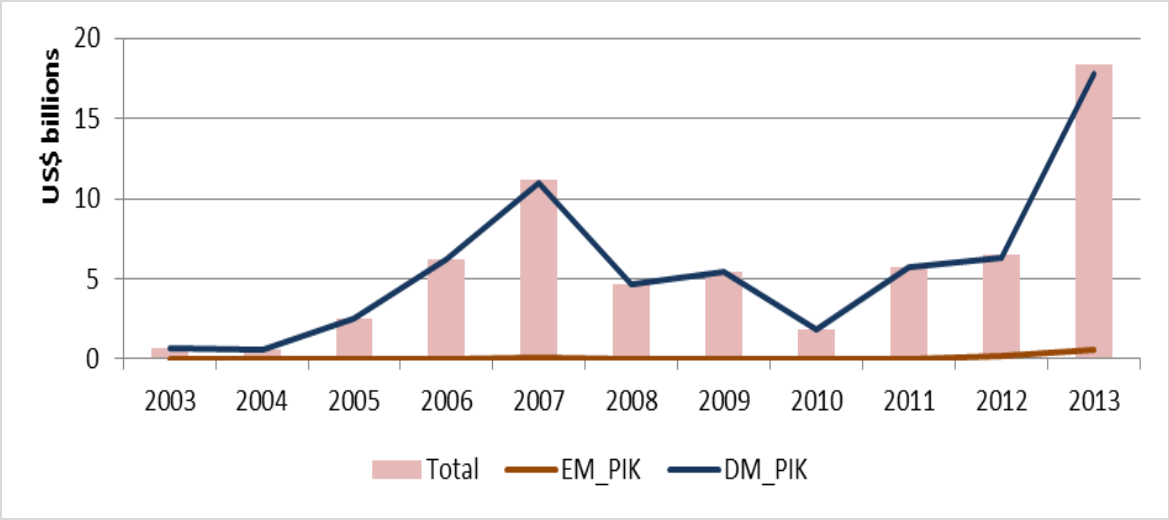
In 2013, Contingent Capital issuance reached $15.2 billion according to Dealogic. European banks, in particular, UK banks, accounted for the greatest share of this issuance (European issuance reached $14.3 billion in 2013 alone). The majority of this issuance was in the form of write-down bonds ($10 billion). CoCo issuances in 2013 reached just $5 billion. Issuance levels before 2013 were negligible.

The BIS[74] notes that the investor base for Contingent Capital is diverse. Investors include retail investors and private banks in Europe and Asia, non-bank financial institutions in Europe, and institutional investors in the US – tempted by the higher yields offered. However traditional investors such as insurance and pension funds are not so active in these markets, mainly due to the lack of credit ratings for these products.[75]

Write-down bonds may be prone to market manipulation, if the leverage of the derivative is used as a profit maker in a two-way trade. However, CoCos and write-down bonds are a relatively new issuance class, making it difficult to assess how these bonds will actually perform during periods of market stress. Further research is needed to understand the consequences of these small but growing debt products, from an investor protection and systemic risk perspective.[76]

In addition Payment-in-kind (PIK) bonds have also made a comeback since the onset of the crisis. PIK bonds work by paying investors in additional debt or equity, rather than cash. Essentially, issuing firms pay out yields on their debt by issuing more debt. In the lead up to the crisis PIK bonds also surged, but even at its peak ($11 billion) in 2007, issuance levels were below the $18 billion reached in 2013 (see Figure 21).

Figure 21: PIK bond issuance



Source: Dealogic Note: Data end 2013; Note: DM (Developed Markets in sample and EM (Emerging markets in sample).

[74] Stefan Avdijiev, Anastasia Kartasheva, Bilyana Bogdanova, 'CoCos: a primer', in BIS Quarterly Review, September 2013
[75] According to BIS, only half of current CoCo issues are rated.
[76] For example, it is possible that during periods of distress, equity conversion of CoCos may instill further panic over the performance of the firm and dilute equity, pushing stock prices down further and exacerbating financial issues.

4.2 Bond risks and the secondary market

The nature of bond risks means that an interest rate increase will create winners and losers, but this does not translate into systemic risk and investor protection issues on its own. The financial crisis was in part caused by excessive leverage and speculation on the parts of banks and households in the real estate, derivatives and structured products markets. [77] Some of this speculation may have shifted into corporate bond markets, in the form of a search for yield. In the current low interest rate environment, such behaviour on the part of investors is positive, allowing firms to keep operating and spurring economic recovery. On the other hand, as interest rates normalize, investors will be left holding depreciated bonds – in other words, they may no longer be compensated (in relative terms) for the initial risks they took on.

If investors are well-informed, experienced and have diversified their risks properly,[78] this is unlikely to pose a systemic risk or introduce investor protection issues on its own, especially considering (1) the small amount of investment apportioned to high yielding products; and (2) the dominance of institutional investors in corporate bond markets. Furthermore, an interest rate increase signals recovery in the economy in the US and Europe and thus may imply a reduction in default risk. Nevertheless, understanding how bond risks may behave in a changing interest rate environment is an important element in investigating the development of corporate bond markets going forward.

Investing in corporate bonds incurs different levels of risk, depending on the type of bond invested in. Broadly, these risks can be categorized as 'default risk', 'call risk', 'liquidity risk' and 'interest rate risk'.[79] Default risk refers to the risk that the issuing firm will face bankruptcy and default on its debt, unable to return all or some of the principal owed to bondholders. Liquidity risk encapsulates the fluctuation in the value of bonds based on changing supply and demand factors in the secondary market. In the case where a bondholder needs to sell its bond before maturity, low demand (low liquidity) on the secondary market could discount the value of the bond, leading to a loss. Interest rate risk refers to the inverse relationship between bond price and interest rates. If interest rates rise, the value of a bond on the secondary market will fall since newly issued bonds will be offering a relatively higher yield. Call risk refers to a call option embedded in a number of bond issues that allows the issuing firm to repay debt before maturity and thus stop future yield payments. The opposite of a callable bond is a putable bond, which holds risks for issuers (See *Chapter 3*).

Default Risk

Default rates spiked in 2000 and 2009, but have since reduced to pre-crisis levels. The default rate of high yield corporate bonds was below that of non-performing loans in 2012. Figure 22 presents Moody's original data on default rates. The trend in rates shows a peak in 2000, around the dot-com crash and again in 2009, as the financial crisis and euro-crisis took hold. In the last few years, default rates have stayed low, with a slight uptick in 2012. High Yield bond defaults reached 3% and investment grade bond defaults reached 0.04%. In comparison, non-performing loans globally ticked

[77] See Adrian Blundell-Wignall and Caroline Roulet, "Long-term investment, the cost of capital and the dividend and buyback puzzle', *OECD Journal: Financial Market Trends*, Volume 2013, Iss I

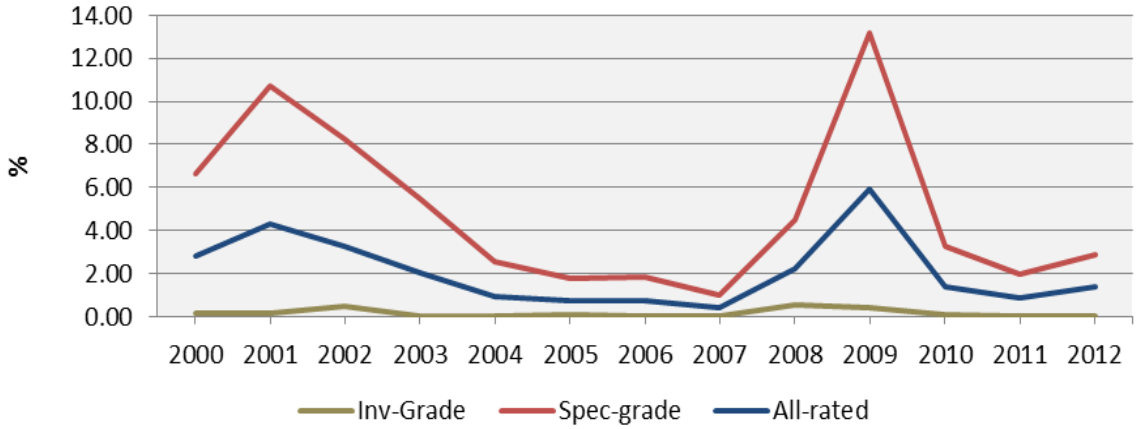
[78] For example, anticipating the interest rate rise through hedging.

[79] Event risk is also recognized as a class of bond risk. Event risk is a broad term to describe a variety of negative events that may unfavorably impact the value of a bond e.g. changes in taxation, firm takeover etc. Such risk is difficult to monitor and measure quantitatively and so is not included in this discussion.

up in 2009, albeit still below dot-com crash levels in 2000. By 2012, the rate of non-performing loans reached 4%, higher than the default rate of high yield corporate bonds.

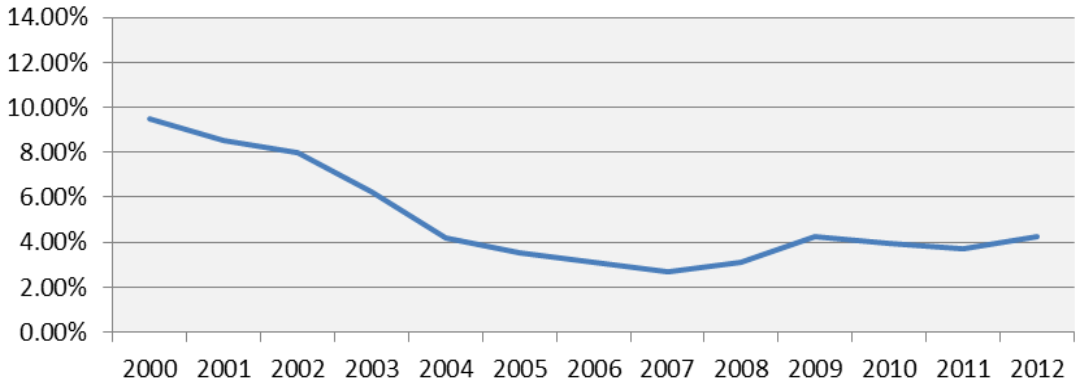
Figure 22: Default rates and non-performing loans – global (%)

Corporate bond default rates



Source: ©Moody's Investors Service, Inc. And/or its affiliates. Reprinted with permission. All Rights Reserved.

(Non-performing loans



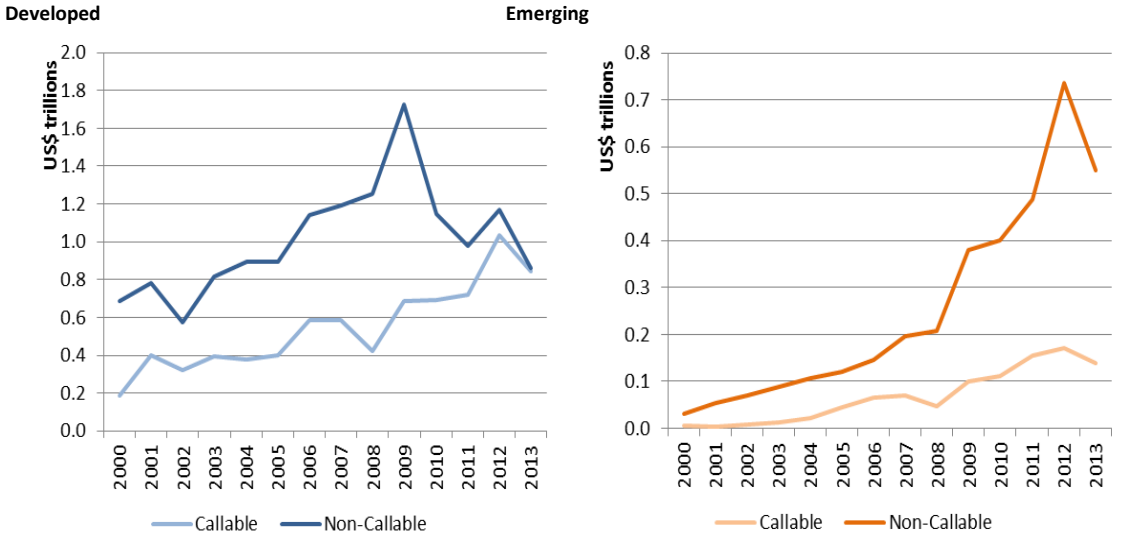
Source: World Bank. Note: 2012 value extrapolated as average from available regional level rates.

Call Risk

Callable bond issuances have been increasing since the onset of the crisis. Almost half of bonds issued from developed markets and 20% issued from emerging markets had a call option embedded in 2013. While theoretically riskier from an investor perspective an increase in callable bonds could be more an indication of business optimism and/or a desire for flexibility. Figure 23 compares trends in callable vs non-callable bonds, issued in the last 13 years. In developed markets, both types of bonds increased steadily in the lead up to the crisis. In 2009, non-callable bonds peaked in issuance, while callable bonds plummeted. However, since then non-callable bonds have been on a strong downward trend while callable bonds have been on a steep upward trend. In 2013 almost half of all bonds issued had a callable option.

In emerging markets, callable bonds and non-callable bonds have both been increasing over the last decade. Since the onset of the crisis, non-callable bond issuances have been increasing more steeply, making up 80% of issuances in 2013.

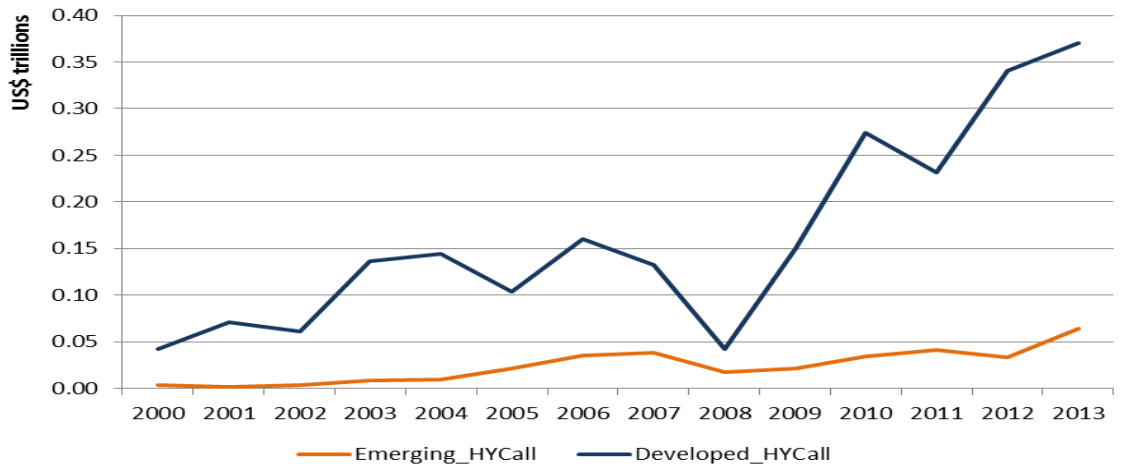
Figure 23: Callable vs Non-Callable



Source: Dealogic Note: 2013 data extracted as of September, not annualized.

The call option on bonds is normally only activated if the interest rate drops, allowing firms to call back their debt and re-issue at a lower cost. Since investors will lose their yield and face reinvestment risk, such bonds offer a higher yield. In other words, they should be more expensive for an issuing firm. The increase in callable bonds in the low interest rate environment suggests another dynamic is at play. This trend could reflect business optimism i.e. high yield firms which anticipate an upgrade to investment-grade status in the medium-term and thus an ability to issue debt at a lower cost. In fact, Figure 24 shows an upward trend in high yield callable bonds issued in both developed and emerging markets. In 2013, $370 billion of high yield callable bonds were issued in developed markets and $63 billion in emerging markets. Alternatively, an increase in callable bonds may be reflective of (1) an increasing desire on the side of firms to have more flexibility on their balance sheet and (2) that interest rates are low enough for firms to spend more to get some flexibility.

Figure 24: High Yield Callable Bonds



Source: Dealogic. Note: Data extracted end 2013

Interest Rate Risk

Interest rate risk may affect portfolios heavily invested in investment grade corporate bonds more than those invested in high yield. If interest rates go up, the value (market price) of a bond goes down. This means that if interest rates rise, bondholders wishing to sell their bonds on the secondary markets will face a potential depreciation on their investment. This should affect interest rate sensitive fixed income classes such as investment grade bonds, more than credit sensitive fixed income classes such as high yield bonds (see Box 5).

Box 5: Bond yields and interest rate changes

As mentioned in Box 3, bond yields are made up of two main components, in its most basic form: credit risk (CR) and inflation compensation – or coupon rate (IC) (a reflection of real interest rates). Taking a theoretical example of a five high yield bond with yield of 7% and a five year investment grade bond with yield of 4%:

A high yield issuance	**An inv. grade issuance**
IC of 3%	**IC of 3%**
CR of 4%	**CR of 1%**
Yield of 7%	**Yield of 4%**

If Interest rates increase from 3% to 5% and default rates remain the same given strengthening economic fundamentals:

- Future high yield issuances would see a move in the IC from 3% to 5%, however the CR would stay the same at e.g. 4%. So the total yield for old high yield issuances vs new high yield issuances would be 7% to 9% .
- Future investment grade issuances would see a move in the IC from 3% to 5% and the CR would remain the same at originally 1%. So the total yield for old vs new issuances would be 4% to 6% .

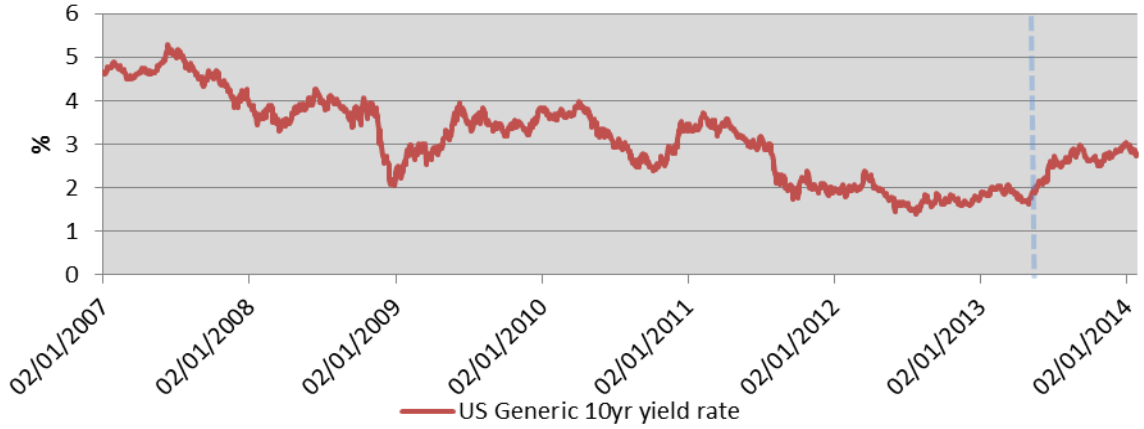
If we assume that the 5 year investment grade bond was purchased for $100 dollars. At maturity, the bondholder will have been paid back $120 (principal +0.04 yield per annum). If interest rates increase to 6%, new five year bonds will pay back $130. Holders of the old bond will face a lower market price on the secondary market to compensate for the reduction in value of their bond – by 8.3%.

For the 5 year high yield bond bought at $100 dollars, at maturity the bondholder will have been paid back $135. When the interest rate rises to 9%, new high yield issuances will pay back $145 at maturity. The reduction in value will be 8.1%

… unless default rates prove heavily endogenous to interest rates. Increasing default rates would impact the value of high yield issuances more than investment grade. If the default rates are strongly endogenous to interest rate increases i.e. if rising interest rates negatively impact the default rate, then high yield bond issuances could further depreciate. This could be the case where high yield firms are set to face a refinancing squeeze as interest rates increase and debt matures – increasing their chance of default. Conversely, rising interest rates may signal economic recovery, in which case default rates may decrease, leading to anticipated lower credit risk.

In the United States, an increase in the generic government bond yield, after the tapering announcement in May 2013, has come hand in hand with a tightening of the yield spreads for US investment-grade and high yield corporate bonds. The spread is the premium offered for corporate bonds to compensate for holding a riskier asset as compared with a 'risk free' asset such as the US generic 10 year bond. After the US Federal Reserve announced its plans to taper its quantitative easing program in May 2013, the US generic 10 year bond yield increased by around 1 percentage point from 2% to 3% - between May and December 2013 (see Figure 25).

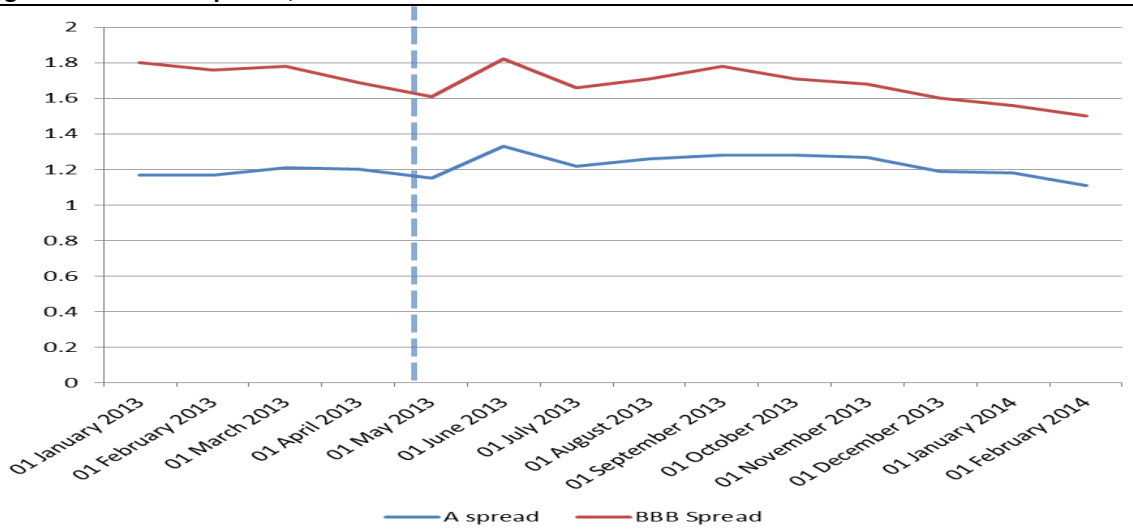
Figure 25: US generic 10 year yield rate



Source: Bloomberg Note: dotted line represents interest rate announcement.

During the same period, US BBB (high yield) spreads over US treasuries decreased by around 11% and US AAA (investment grade) by around 8% (see Figure 26). This suggests that spreads for high yield are tightening more than for investment grade.

Figure 26: US Bond Spreads, %



Source: Bloomberg Note: dotted line represents tapering announcements Note: corporate yield minus US treasury yield 10 year. Note 2: dotted line represents tapering announcement.

Liquidity risk can exacerbate interest rate risk and is primarily related to the smooth functioning of the secondary market. A functioning secondary corporate bond markets can confer a number of advantages for investors and the financial system at large. These advantages include:

- Smoothing out the effects of a sell-off during financial distress;
- providing investors with a wider range of asset subclasses to choose from and transact with;

- encouraging increased transparency and information efficiency;[80] and
- facilitating the use of corporate bonds as hedging instruments and as collateral, injecting collateral into the system. For example, a wider set of corporate bonds could be posted on a clearinghouse as collateral. [81]

Where secondary market liquidity is low, sellers may encounter difficulties in selling their bonds to appropriate buyers for the price they want. In the case of a widespread sell-off, brought about by an interest rate rise, low secondary market liquidity could exacerbate the run, putting downward pressure on prices as bondholders and funds compete to offload their devalued bonds on a market with few ready buyers. This can lead to a number of issues for retail investors and confidence in the market, which are discussed further in *section 4.2* and *Chapter 5*.

4.3 Retail participation

The aforementioned risks are especially salient when it comes to retail investors. The interactions between the risks associated with bonds are complex, especially in an uncertain economic environment. Given that many corporate bonds are often characterized as non-fungible[82] and non-standardized, [83] retail investors may not be equipped to assess these risk dynamics.

For this reason, corporate bonds have traditionally been a channel through which institutional investors meet the private/commercial interests of another institution. Traditionally, corporate bonds have been issued by financial or non-financial firms and invested in by institutional investors.[84] Well-developed corporate bond markets usually involve a diverse investor base including traditional investors (banks, pension funds), official sector (domestic and foreign central banks, sovereign wealth funds, state-owned entities) and also foreign investor participation and investment funds.

Retail participation in the corporate bond markets predominantly occurs through mutual bonds funds. [85] Over 90% of mutual funds are owned by retail investors. [86] Historically, mutual bond funds have been appealing for retail investors who desire safe haven investing[87] or to a lesser extent; wish to speculate on interest rate movements. [88] Also, they are diversified with low transaction costs. Bond funds work by distributing income to investors in the fund. This income is based on the total return on the fund, which is a combination of the capital appreciation[89] and the interest (yield) received on the securities in the portfolio.

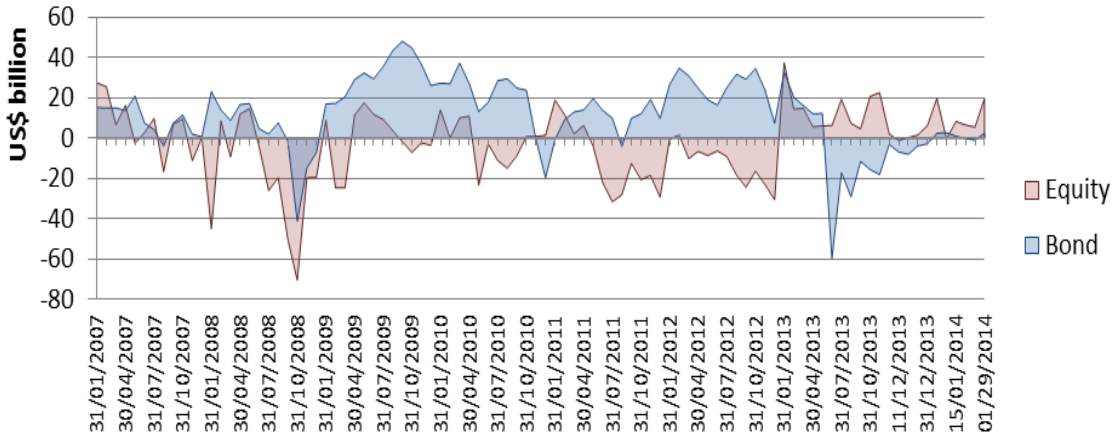
A changing interest rate environment can impact the return enjoyed by bond fund investors. This effect is especially salient for absolute return bond funds which may take a capital hit as the net

[80] Abdourahmane Sarr and Tonny Lybek, "Measuring Liquidity in Financial Markets", IMF Working Paper, 2002
[81] Governor Jeremy C. Stein, "Overheating in Credit Markets: Origins, Measurement, and Policy Responses" At the "Restoring Household Financial Stability after the Great Recession: Why Household Balance Sheets Matter" research symposium sponsored by the Federal Reserve Bank of St. Louis, St. Louis, Missouri, February 7, 2013
[82] Fungibility refers to the interchangeability of assets of the same type.
[83] ICMA, 'Economic Importance of the Corporate Bond Markets'
[84] Given that many corporate bonds are often characterized as relatively complex, non-fungible and non-standardized there is a view that retail investors may not be equipped to assess the risk see – see Economic Importance Corporate Bond Markets, ICMA, March 2013; IMF, EBRD, OECD, "Local Currency Bond Markets – A Diagnostic Framework", July 2013
[85] Mutual bond funds are funds primarily invested in bonds. The make-up of the fund can include different proportion of corporate, municipal and government debt.
[86] Nikolaos Panigirtzoglou, Metthew Lehmann, Jigar Vakharia, JP Morgan, 'Flows & Liquidity', 15 Nov 2013
[87] Jean-Pierre Casey & Karel Lannoo, CEPS, 'Europe's Hidden Capital markets' 2005
[88] Nikolaos Panigirtzoglou, Metthew Lehmann, Jigar Vakharia, JP Morgan, 'Flows & Liquidity', 15 Nov 2013
[89] Capital appreciation is the difference between the value of the bonds when initially bought and the value of the bonds when sold.

asset value (NAV)[90] is recalculated on the new mark-to-market rate.[91] Bond funds (including ETFs) may become forced sellers as investors seek to redeem.[92]

Bond funds experienced substantial inflows[93] after the crisis broke out, as retail investors were faced with a low interest rate environment. Figure 27 presents US data on bond fund flows. Inflows were especially strong after 2009, as the US Federal Reserve quantitative easing program took effect. However in the second half of 2013, bond funds saw substantial outflows while equity funds saw inflows. This was driven by the tapering announcement of the US Federal Reserve. Bond fund inflows peaked at $48 billion in the month of September 2009, with outflows oft $60 billion in the month of June 2013 (following the tapering announcement). In the last month of 2013, bond funds saw outflows of around $1 billion but by January 2014, bond funds again experienced inflows of $2 billion.

Figure 27: Bond fund flows - US



Source: ICI Note: Bond fund data for long-term mutual funds. Note 2: According to ICI, data is weekly cash flows, estimates, that are adjusted to represent industry totals, based on reporting covering 95% of industry assets, while monthly flows are actual numbers as reported in ICI's 'Trends in Mutual Fund Investing'.

However, most bond funds have tools in place to absorb the impacts of such sell-offs. Interest rate changes are not always unanticipated and interest rate risk is a well understood element of bond investing. Professional investors[94] can hedge against rising interest-rates to protect investor capital (see Box 6). Furthermore, as bonds depreciate and investors turn to the market to offload them, bond funds may themselves choose to absorb some of the inflow of 'cheap' bonds on the market in order to boost their portfolio value. Lastly, bond funds usually have cash reserves to cover large redemption demands during periods of stress.[95] In the occasion that these tools are insufficient to deal with the magnitude of the sell-off and a heavily illiquid secondary market, bond funds also have the ability to delay or stagger redemptions (depending on the jurisdiction) in order to limit the chance of a 'fire sale'.[96] However, in utilizing this course of action, confidence in investing in bond

[90] The NAV of a fund is based on the closing market price of all securities in the portfolio at the end of a trading day, minus any management fees and divided by the number of issued shares of the fund.
[91] The market-to-market rate refers to the current market value of all the securities in a portfolio.
[92] In some jurisdictions, pension funds recalculate the NAV on a quarterly basis, making the value of bond holdings less vulnerable to interest rate changes. However, in some jurisdictions, pension funds recalculate on a daily basis.
[93] Taking the US as an example, due to the availability of data and its majority representative portion of the market:
[94] Some ETF and bond funds are already preparing for a new interest rate environment. For example, ProShare Advisors embedded interest-rate protection into a new bond exchange traded fund – using US government bond futures to hedge against interest rate risis.
[95] Typically bond funds have 5% of their assets in cash equivalents to cover mass redemptions.
[96] A fire sale refers to a distressed situation where the value of a security is severely discounted.

funds may be negatively affected, with implications for corporate financing opportunities. This is discussed further in *Chapter 5*.

Box 6: Hedging with derivatives

Hedging involves offsetting a risk associated with a certain security in a portfolio by balancing it with a security that operates in the opposite direction under particular market conditions.

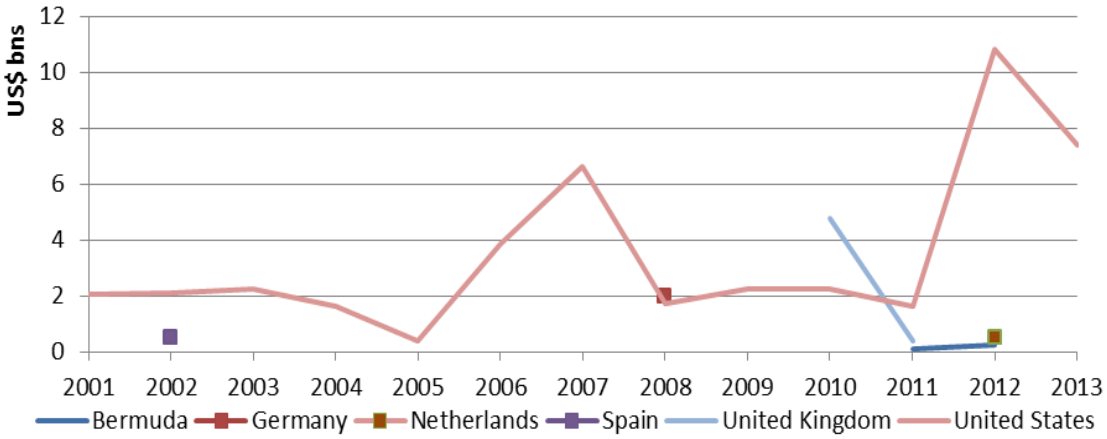
Bond investors and funds can hedge using swaps. For interest rate risk, interest rate swaps are often used.[97] An interest rate swap is a derivative contract between two parties, where one party with a fixed interest rate asset exchanges the interest rate payments for the payments on a floating rate asset, over a period of time. In vanilla interest rate swaps, the floating rate is usually a benchmark rate such as LIBOR. This allows holders of fixed-income assets to offset any losses in their portfolio from an interest rate increase.

Futures contracts can also be used to hedge interest rate changes. Futures contracts work by obliging a buyer of the contract to purchase an agreed quantity of bonds on a future date for a price set in advance. Bond funds can hedge the interest rate risk in their portfolio through a short position in a Treasury Bond futures contract. If interest rates rise and the price of bonds in the portfolio drops, this would be offset by a rise in value of the short position.

In recent years, some firms have begun issuing corporate bonds specifically for retail investors, predominantly in the United States. While corporate bonds are traditionally structured for institutional investors, there are corporate bonds structured specifically for retail investors or for both institutional and retail investors.

Figure 28 tracks corporate bond issuances specifically for retail investors. Since 2000, 164 corporate bonds for retail investors have been issued, with a value of $53.6 billion. According to the available data, six countries have seen this type of issuance. For most countries, retail issuances were a one-off occurrence. But for the United States, retail issuances have existed since 2001, peaking in 2012, reaching almost $11 billion. According to Dealogic, the majority of bonds issued for retail investors have been long-term (95% between 2000 and 2013). 5% of retail issuances have been medium-term and no retail issuances have been short-term.

Figure 28: Issuances for retail investors



Source: Dealogic

[97] For other types of risks, other forms of swaps can be used e.g. currency swaps for foreign exchange risk, credit default swaps for credit risk.

Further research could continue to monitor development in the retail bond markets, and collect a broader data set on retail bond issues – including from emerging markets. In particular, data on management fees faced by retail investors could be useful.

❑ Chapter 5 – Transformation of Secondary Markets

Data on secondary markets is scarce globally. What data is available suggests some decrease in secondary market liquidity in developed markets. However, this may be more a remnant of (1) active corporate bond markets in an artificially low interest rate environment, combined with (2) a reduction of risky, pre-crisis activities that used bonds from the secondary market e.g. CDOs. In fact, secondary markets appear to be going through a period of transformation – with new traders entering the fray, calls for standardisation and electronic trading set to increase. Further research should focus on the potential for this transformation, since past trends and measures of liquidity may not prove an adequate benchmark to assess secondary market efficiency, functioning or systemic risk.

5.1 Secondary Market Liquidity

Data on secondary markets can be digested through a number of measures including: the bond turnover ratio, dealer inventories of corporate bonds and bid ask spreads. These measures provide insight on factors such as secondary market activity, pricing, transparency and liquidity – all aspects of market efficiency.

However, globally, data on secondary markets is scarce. For example, bid ask spreads can elucidate pricing effects, indicate transparency and support inferences on liquidity. Yet, while a number of studies[98] have been undertaken to calculate bid-ask spreads for particular corporate bond markets, a global, comprehensive, comparable time series is not readily available or accessible by the authors of this report. Similarly, data on bond turnover ratios and dealer inventories is available for only a limited amount of countries.

What data is available suggests that the corporate bond turnover ratio,[99] one measure of secondary market liquidity, is higher in developed markets than emerging markets. However, the turnover has been decreasing in developed markets and increasing in emerging markets since the onset of the crisis. Figure 29 presents the calculated government and corporate bond turnover ratio for markets where data is available. [100] It shows that secondary market liquidity in corporate bond markets in the US[101] and Japan has dropped around 45% and 63% respectively since the crisis, with the turnover ratio reaching 0.7 in the US and just over 0.05 in Japan in 2013.

In comparison, the sovereign bond turnover ratio in the US was 15 in 2003 and 1.2 in Japan. The highly liquid United States sovereign bond secondary market may be due to the popularity of United States treasury debt as a safe haven, highly standardized issuance procedures, and capital requirements that favor United States treasuries as low-risk collateral. At the same time, the

[98] 'European Corporate Bond Markets; transparency, liquidity, efficiency', *London Business School and CEPR,* London, 2006; Bruno Biais and Fany Declerck, '*Liquidity, competition & price discovery in the European Corporate Bond Market*', Toulouse School of Economics, working paper, 2013; see also MarketAxess research and data on bid-ask spreads.

[99] A bond turnover ratio is calculated by dividing the annualized volume of daily trading activity or annual traded bonds volume by the total amount outstanding for that year. A ratio of over 1 suggests that for every one bond accounted for in the global stock (outstanding), one bond is being traded. However, the same bonds can be traded multiple times elevating the ratio.

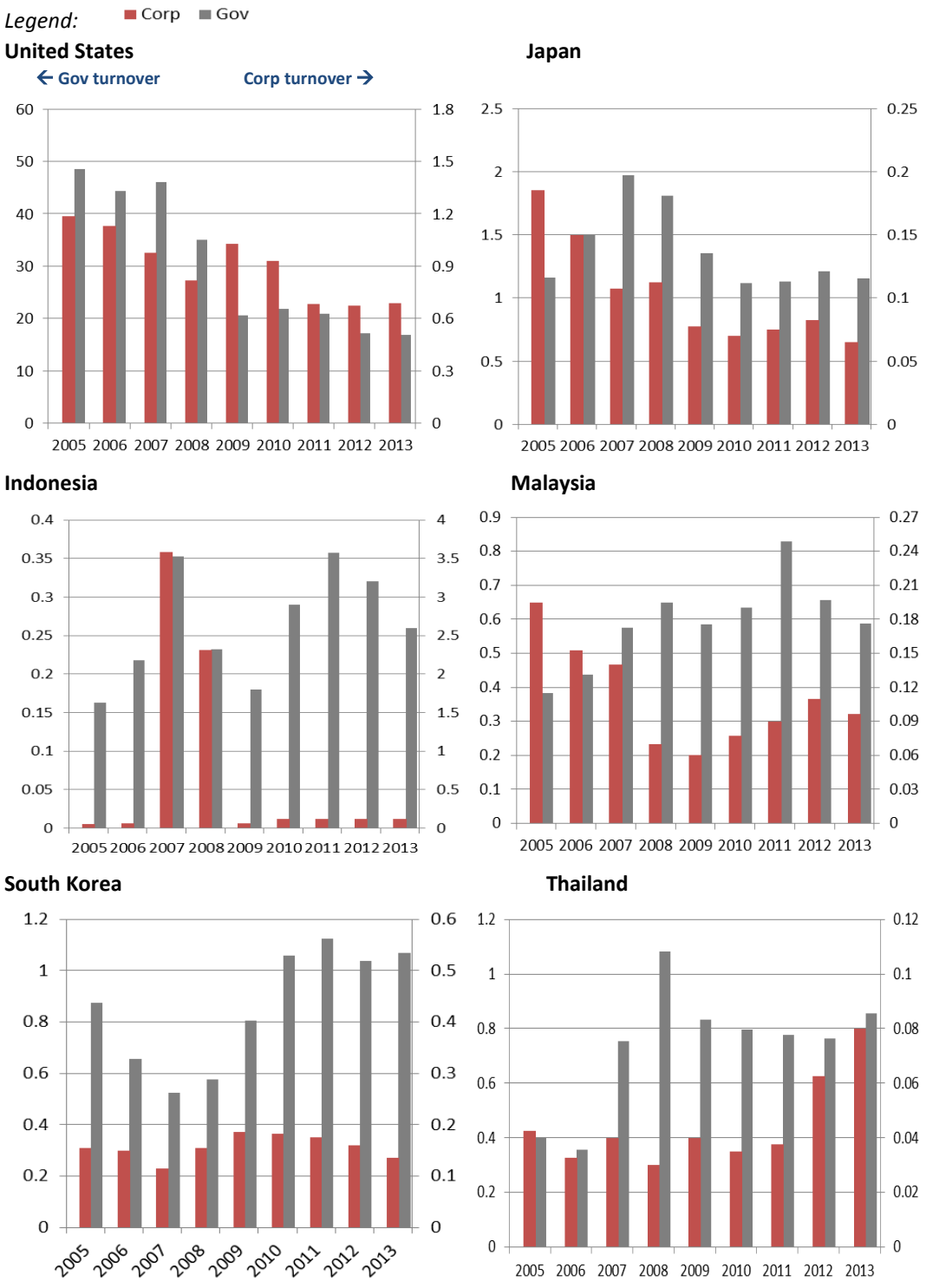
[100] For the United States, TRACE data is sourced from SIFMA and is thus derived from a different calculation of amount outstanding than used in *Section 3.1*. For emerging Asian countries, ABO data provides the bond turnover ratio for local currency issuances only.

[101] It is difficult to gain a global picture on secondary market trading as comparable data is difficult to find. The US FINRA's TRACE system provides some insight into the health of US secondary corporate bond markets. The absence of centralized corporate bond trade reporting arrangements in Europe means that no complete and comparable dataset is available on European secondary market liquidity.

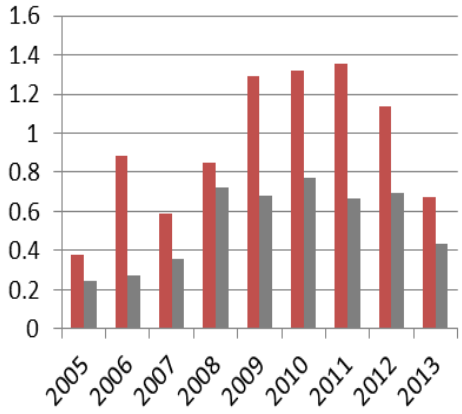
government bond turnover ratio has been reducing since the onset of the crisis, in both the United States and Japan, most likely due to central banks hoarding sovereign debt as part of their quantitative easing programs.

For selected Asian emerging markets, secondary market liquidity for corporate bonds has actually been on an increasing trend since the crisis. However for China and South Korea, liquidity has been decreasing since 2011. The government bond turnover ratio is higher than the corporate bond ratio for all markets except for China.

Figure 29: Corporate bond turnover ratios vs sovereign bond turnover ratio



China



Source: SIFMA, Asian Bonds Online Note: data for 2013 is based on last available (March, June and September)

The relative liquidity of government bond markets compared to corporate bond markets is expected. Government bond market issuances tend to be standardized with trading already occurring in large volumes over centralized, electronic platforms.[102] 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.[103] Furthermore, since bondholders are promised principal repayment once the bond matures, bondholders may choose to adopt a 'buy-and-hold' strategy.

However, the bond turnover ratio is just one measure of secondary market liquidity and can be biased by unusual market conditions and 'phantom liquidity'. A broader range of secondary market liquidity indicators and more comparable dataset of trading activity and corporate bond outstanding are needed to enhance understanding of liquidity risk across a larger range of countries. Furthermore, a theoretical understanding of how secondary markets are transforming can put these indicators in context. The next sections explore the nature of secondary market transformation and some additional measures in the context of the US market.

[102] Jean-Pierre Casey & Karel Lannoo, CEPS, 'Europe's Hidden Capital markets' 2005

[103] 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.

5.2 Disentangling 'phantom liquidity'

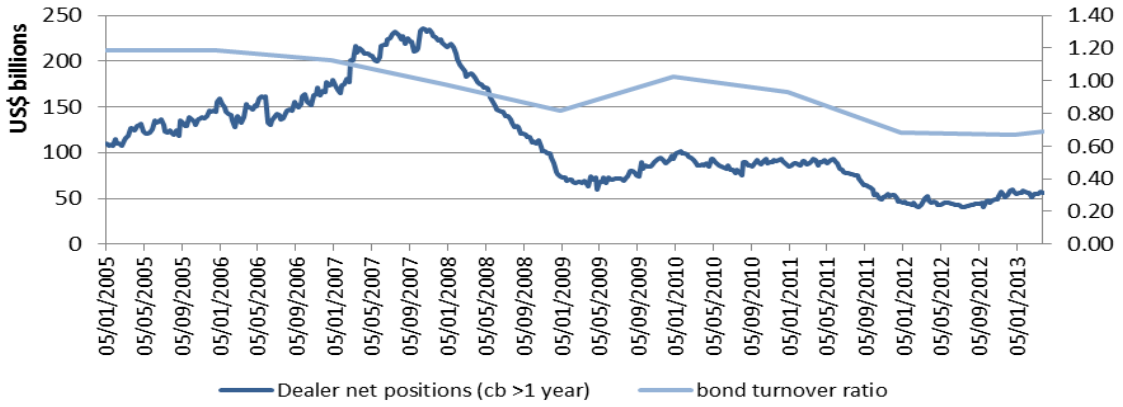
Data from the US is primarily focused on in this section due to availability. Furthermore, the US, due to its size, provides a representative portion of total global markets.

Accommodative monetary policies aimed at kick starting global economic recovery, have worked to drive down real interest rates and reduce borrowing costs for issuing corporate bonds. As discussed in *Chapter 4*, declining and negative market and policy interest rates have triggered a global search for yield amongst developed market investors, with bond inflows surging.

While liquidity in the primary market has increased, dealer inventories of corporate bonds and the bond turnover ratio are decreasing… Figure 31 presents data on dealer inventories in the US up to March 2013 (where data ends), the declining bond turnover ratio, trading activity and amount outstanding. As regulatory changes have taken effect, dealer inventories of corporate bonds have declined. The first graph shows that between 2008 and 2013, dealer inventories of corporate bonds have dropped nearly 76% - from a high of $234 billion to around a quarter of that ($56 billion) in March 2013. The bond turnover ratio has decreased since 2008, kicking up slightly in 2013 but decreasing 30% between 2008 to 2013. However it is important to note that dealer inventory figures include holdings of asset-backed securities.

Figure 30: Dealer Inventories, bond turnover ratio- US

Net positions[104]



Source: SIFMA , New York Federal Reserve Note: Data for US only. Note: *as of September. Note: Outstanding based on SIFMA data for US corporate bond outstanding (for corporates) and may differ from BIS data on corporate bond outstanding due to differing methodologies. Note2: Dealer inventories data goes to March 2013. Note 3: Bond turnover ratio based on yearly aggregated data-extrapolated across the time series, value at December of each year. Note 4: Dealer inventory of corporate bonds, including asset-backed securities.

Some suggest[105] that this is reflective of a reduction in the ability of the secondary market to absorb shocks in the case of a bond sell-off e.g. as interest rates continue to rise. This is because, since the 1940s, dealer-banks have been relied on to engage in market-making functions in the secondary corporate bond market, due to the difficulties inherent in trading highly differentiated bond contracts.[106] Dealers act as buffers absorbing the bonds that investors wish to sell and holding till an

[104] the difference between long and short positions

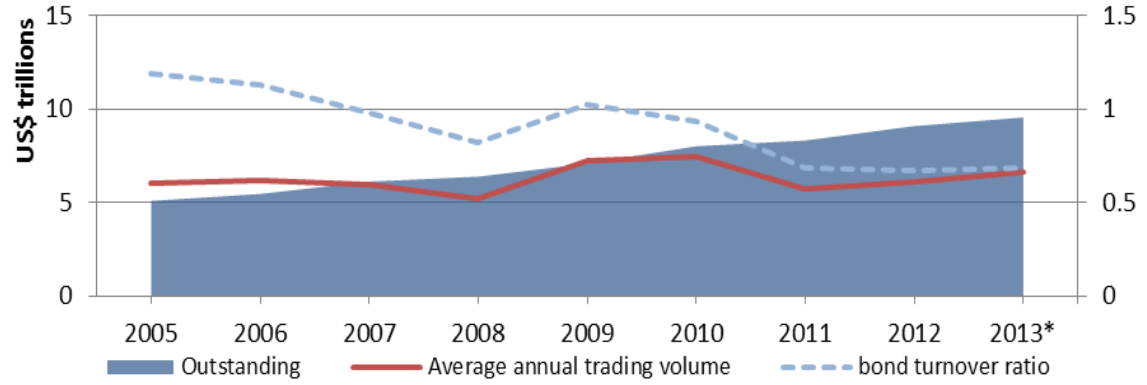
[105] See Henry Chien, Will Rhode, 'Real-time corporate bond prices: Panacea or Pipedream', TABB Group, April 2013; BlackRock, 'Setting New Standards: *The Liquidity Challenge II',* May 2013; Tobias Adrian, Michael Fleming, Jonathan Goldberg, Morgan *Lewis, Fabio Natalucci, and Jason Wu*, "Dealer Balance Sheet Capacity and Market Liquidity during the 2013 sell-off in Fixed Income Makets", FEDS notes, October 2013; Nikolaos Panigirtzoglou, Seamus Mac Gorain, Mathew Lehmann, Jigar Vakharia, "Flows & Liquidity: How liquid are corporate bonds?", JP Morgan, 12 July 2013; Matt King, "Back to black: Positioning for the wrong sort of recovery", *Citi Research,* October 2013

[106] Market-making is a practice whereby specific market participants provide liquidity to a market, facilitating trade and development.

appropriate buyer can be found. Thus, decreasing dealer inventories of corporate bonds is in stark contrast to increasing liquidity (issuance) in the primary market.

… and while dealer inventories are shrinking, average annual trading volume is actually increasing. However, this may be masking as situation where a few bonds are traded over and over and rest remain illiquid. In Figure 31, it becomes clear that the average annual trading volume has increased by around 21% between 2008 and 2013 (from $5.2 trillion to $6.6 trillion). Thus, the decline in the bond turnover ratio is actually symptomatic of the sharp increase in corporate bond outstanding - which has increased 51% over the same period (from $6.4 trillion to $9.5 trillion) – rather than a decrease in trading.

Figure 31: bond turnover ratio, trading volume - US



Source: SIFMA , New York Federal Reserve Note: Data for US only. Note: *as of September. Note: Outstanding based on SIFMA data for US corporate bond outstanding (for corporates) and may differ from BIS data on corporate bond outstanding due to differing methodologies. Note2: Dealer inventories data goes to March 2013. Note 3: Bond turnover ratio based on yearly aggregated data-extrapolated across the time series, value at December of each year. Note 4: Dealer inventory of corporate bonds, including asset-backed securities.

However a number of studies note fragmentation in liquidity of bonds traded in the secondary markets in both the pre and post-crisis period – with a wide gap between the most liquid bonds and the least liquid bonds.[107] There is a high level of trading in periods immediately following issuance and a steep drop-off thereafter.[108] Shorter-term bonds tend to be more liquid than longer-term bonds.[109] As such increasing trading activity may be masking a situation where a small percentage of corporate bonds are very liquid, while the rest are difficult to move.[110] As trading volumes are a component of the bond turnover ratio, this dynamic can make the market seem more liquid then it is.

Increased transparency could be one factor impacting the market-maker role of dealer banks, however dealer inventories of corporate bonds did not drop after full integration of the TRACE system in the United States. Market-making is hinged on a market distortion (i.e. asymmetric information). The vast majority of corporate bonds are traded over-the-counter, via telephone with trades recorded manually. Historically, prices for traded bonds have not been publicly or even widely

[107] See Goldman Sachs Investment Research; JP Morgan Research; Black Rock, BlackRock, 'Setting New Standards: *The Liquidity Challenge II'*, May 2013

[108] See Gordon Alexander, Amy Edwards, Michael Ferri, 'The determinants of trading volume of high-yield corporate bonds', *Journal of Financial Markets,* vol 3, 2000; Arvind Krishnamurthy 'The Bond/Old-Bond Spread', *Journal of Financial Economics,* vol 66, 2002; Amy Edwards, Lawrence Harris, Michael Piwowar, "Corporate Bond Market Transparency and Transaction Costs", *Working Papers series,* 2004

[109] Nils Friewald and Rainer Jankowitsch and Marti Subrahmanyam, 'Illiquidity or credit deterioration: A study of liquidity in the US corporate bond market during financial crises', *Journal of Financial Economics*, vol 105, 2012

[110] See: BlackRock, 'Setting New Standards: *The Liquidity Challenge II',* May 2013 - According to a Blackrock report released in May 2013 the top 2% of US IG bonds by volume accounted for nearly a third of overall trading in the first quarter of 2013, and the top quintile of bonds by volume accounted for 93% of overall trading in the same period.

available. This can inhibit clear price formation, by restricting the amount of information available to buyers and sellers – except for the largest players.

Where bid ask spreads[111] for corporate bonds markets globally are not readily available, large traders of bonds can build their own templates based on their own portion of trades: the larger the player the more of the market they can 'see', creating a potentially uneven playing field. [112] As such, such players can generate income out of bid-ask spreads. [113] As such, in corporate bond markets, dealer banks were able and willing to provide liquidity to the secondary market, since a profit could be made from the opacity of bid-ask spreads – in the absence of price transparency.

Global debate has existed around the necessity for pre- and post-trade transparency in encouraging secondary corporate bond market efficiency and fairness. On one hand, a fairer, more transparent market could attract new traders. On the other hand, removing market opacity may dampen the incentives for dealer-banks to bare the risk of making markets and at the least, confer benefits only to a small group of investors.[114] Where dealer banks are relied on to create liquidity in the secondary markets, increased transparency may come at the expense of secondary market liquidity.[115]

Introduction of post-trade transparency through the TRACE system in the U.S. is levelling the playing field, making it more difficult for large players to earn enormous profits off trades (See Box 7). Nevertheless, after full integration of the system in the beginning of 2006, dealer inventories of corporate bonds were still growing. The decline in dealer inventories did not become apparent until 2008 (see Figure 30).

Box 7: TRACE and market transparency

In 2001, the Securities Exchange Commission in the United States approved rules obliging the National Association of Security Dealers to collect information on all secondary market transactions on TRACE-eligible securities. This information is funneled into the Trade Reporting and Compliance Engine (TRACE) introduced in July 2002. The purpose of TRACE is to increase price transparency in the corporate debt market. The information on trades is made available through TRACE after a slight delay – providing post-trade transparency and assisting in the formation of a current market price.

The introduction of TRACE occurred in phases, between 2002 and 2006. Furthermore, the reporting obligations on dealers have tightened over time. In 2002 dealers could report trades within 75 minutes. By 2005, dealers reported trades within 15 minutes.[116] Since the introduction of the TRACE system, a number of studies have confirmed a decline in trading costs for investors.[117]

[111] The bid ask spread indicates the difference between the highest price a buyer will pay and the lowest price for which a seller will sell. Bid ask spreads can give an indication of secondary market efficiency. A wide bid-ask spread suggests market inefficiency and can be indication of low transparency.

[112] NASD. "NASD's Fully Implemented `TRACE' Brings Unprecedented Transparency to Corporate Bond Market." February 7 2005; A Levitt, "Testimony to the U.S. Congress House of Representatives House Subcommittee on Finance and Hazardous Materials." March 18 1999.

[113] R. A Bravo, "Corporate-Bond Pricing System May Be Too Open, Critics Say." *Wall Street Journal*, April 15 2003

[114] A.K Edwards et al., "Corporate Bond Market Transparency: Liquidity Concentration, Informational Efficiency, and Competition", 2006; U.S. Securities and Exchange Commission, mimeo; Michael Goldstein, Edith Hotchkiss, Erik Sirri, 'Transparency and Liquidity: A controlled experiment on corporate bonds', *The Review of Financial Studies,* v 20, 2007

[115] Jean-Pierre Casey & Karel Lannoo, CEPS, 'Europe's Hidden Capital markets' 2005; Paul Asquith, Thomas Covert, Parag Pathak, 'The Effects of Mandatory Transparency in Financial Market Design: Evidence from the Corporate Bond Market', MIT, September 2013

[116] See Hendrik bessembinder and William Maxwell, 'Transparency and the Corporate Bond Market', *Journal of Economic Perspectives*, 2008 for a history of the TRACE system.

[117] See Bessembinder, H., W. Maxwell and K. Venkataraman, 'Market Transparency, Liquidity Externalities, and Institutional Trading Costs in Corporate Bonds', *Journal of Financial Economics*, 82, 2005; Edwards, A., Harris, L., and Piwowar, M., 'Corporate bond market transparency and transactions costs' *Journal of Finance*, 2006; and Goldstein, M., Hotchkiss, E., and Sirri, E., 'Transparency and liquidity: A controlled experiment on corporate bonds', *Review of Financial Studies, 2007*

Thus, while liquidity in the secondary market has reduced compared to the pre-crisis period, this may be attributable not so much to pre-crisis transparency but to the drying up of pre-crisis 'phantom liquidity'. *Phantom liquidity, for the purposes of this report, refers to liquidity provided to the market on the back of potentially systemically risk practices.* In the US[118] prior to 2007, dealer inventories of corporate bonds were at historically high levels (SeeFigure 31). As such, the liquidity risk incorporated into the bond yield offered was relatively low (compared to the post-crisis period).

This liquidity however, was offered at least partly due to excessive leverage and risk mismatch activities before the crisis, including issuances of asset backed securities and Collateral Debt Obligations (CDOs). Dealers could turn to secondary markets to hedge short-term or package debt (bonds) into leveraged products such as CDOs[119] - injecting liquidity into the system, but also more risk, and at the expense of financial stability.

In this pre-crisis scenario, investors were mollified by a belief that they could offload their bonds through secondary markets if they so needed to and as such issuing firms priced a relatively low liquidity risk into the yield offered on their bonds, resulting in lower borrowing costs. Essentially, while dealers were reducing liquidity risk for corporate bonds investors and borrowing costs for issuers, systemic risk was being introduced into the system through the inclusion of normally illiquid bonds into complex structured debt products.

As the impacts of the financial crisis spread, a number of developments contributed to a decrease in this phantom liquidity. The flipside of this is increased liquidity risk for bondholders. In the post-crisis period, regulation[120] and internal risk controls in banks have curbed the issuance of structured debt products. These developments may mean that dealer banks are less willing to provide liquidity – as observed through reducing dealer inventories – despite rapidly expanding corporate bonds outstanding (see Box 8).

Box 8: Credit Default Swaps

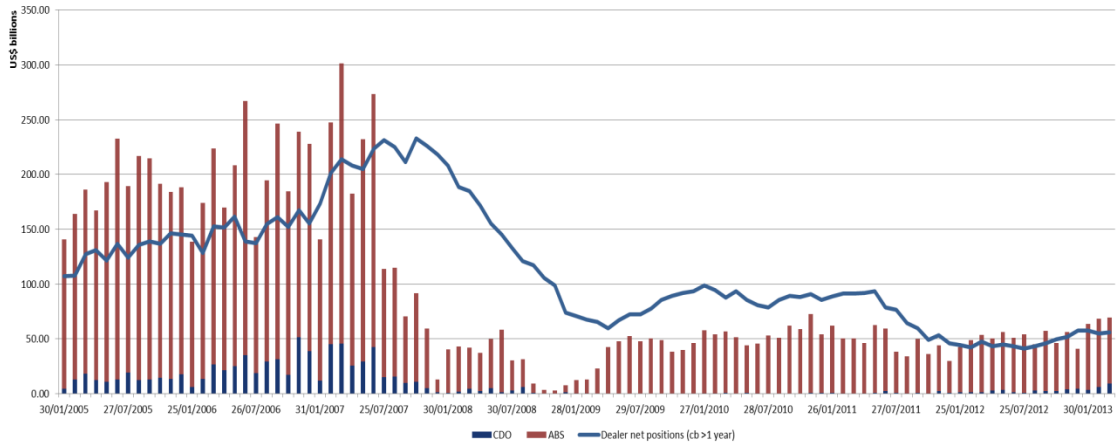
Dealer banks may be re-focusing away from corporate bond market making, towards buying or selling credit default swaps (CDS), which are cheaper, allow for hedging strategies and can give an equivalent pay-off structure to being either long or short a physical bond holding. The market for credit default swaps used to be opaque but is now improving with the introduction of trading through swap execution facilities, clearing through central counterparties and reporting to trade repositories.

IOSCO issued a report on the Credit Default Swap Market in 2012,[121] which investigates the impact of CDS markets on corporate bond markets. The report notes that at the end of 2011, the gross notional value of outstanding CDS contracts reached $26 trillion in the US (net notional value of 2.7 trillion dollars). The report also notes the role of CDS in the price discovery process – effectively bond prices may be set in its derivative market. As transparency improves, further research could investigate activity in this market against secondary bond market liquidity.

In fact,
Figure **32** shows a similar shrinking trend in CDO and ABS issuances and dealer inventories.

[118] Taking the US as an example, due to the availability of data and its majority representative portion of the market
[119] See 'The Financial Crisis inquiry Report, Financial Crisis Inquiry Commission, 2010.
[120] i.e. Basel III, Volker rule on proprietary trading
[121] IOSCO, 'The Credit Default Swap market', 2012 [http://www.iosco.org/library/pubdocs/pdf/IOSCOPD385.pdf]

Figure 32: Primary Dealer Inventories against CDO and Asset/Mortgage-backed securities issuances – US



Source: New York Federal Reserve; Dealogic Note: Data for US only. Note: *as of March 2013. Note 2: rounded to end of month figure. Note 3: Dealer inventory of corporates includes asset-backed securities holdings.

For bondholders, the liquidity risk associated with their bond has increased. This may not be immediately relevant for investors in the market who have adopted a buy-and-hold strategy. However, for bond funds and exchange-traded bond funds, the implications are more serious. As explained in *Chapter* 4, mutual bond funds are majority owned by retail investors and can channel both the 'search for yield' and 'flight to quality' sentiments of these investors. Retail investors may be viewing corporate debt as a safe haven market which offers yield above bank deposits – however, they may not have taken into account or have been compensated for the impacts of changes to liquidity risk brought about by a transforming secondary market.

As interest rates rise e.g. due to economic recovery, the value of previously issued bonds will reduce. Again, as explained in *Chapter 4*, there is a risk that investors will attempt to offload their depreciated bonds *en masse*, and where liquidity in the secondary market is low, this may cause further downward pressure on prices and substantial portfolio depreciation. In a worst case scenario, bond funds may be forced to delay redemptions with potential investor confidence issues resulting.[122]

The reduction of this phantom liquidity could impact bond issuers, who may have to re-consider the liquidity of the bonds they issue. Some new investors will likely seek higher compensation for the liquidity risk they face in this new environment. This means that issuing firms may have to price the higher liquidity risk into the bond yield offered, [123] which would in turn increase the cost of borrowing and potentially impact the composition of financing. For example, if the cost of borrowing via corporate bond markets increases above the cost of issuing an initial public offering on equity markets, firms may gravitate towards equity markets for meeting their financing needs.

This may be an issue for firms attempting to rollover their debt, as they will face higher costs and a potential refinancing squeeze.

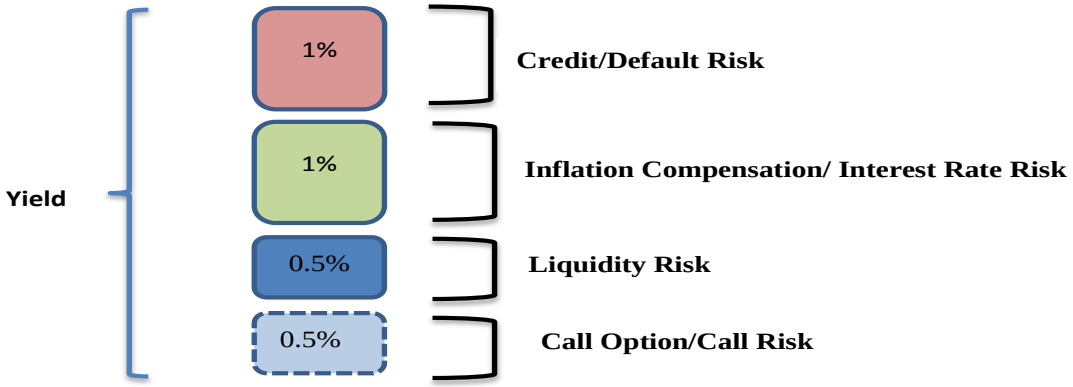
[122] Regulation of bond funds in the US and EU includes requirements around portfolio diversification, liquidity levels and transparency.
[123] There are a number of studies that confirm the inclusion of liquidity risk in the bond yield. For example, see Long Chen, David Lesmond, Jason Wei and Edgar Sullivan, 'Corporate Yield Spreads and Bond Liquiditiy', CFA Digest, August 2007, vol 37; Hui Chen, Rui Cui, Zhiguo He, Konstantin Milbradt, "Quantifying Liquidity and Default Risks of Corporate Bonds over the Business Cycle", Working Paper, December 2013; and Friewald, Nils and Jankowitsch, Rainer and Subrahmanyam, Marti G. (2012) Illiquidity or credit deterioration: A study of liquidity in the US corporate bond market during financial crises. Journal of Financial Economics, 105 (1) – this study confirms that liquidity effects in yields are more prominent during periods of financial distress.

To lower the cost of borrowing, markets could transform further. This may take the form of the introduction and increased usage of multi-dealer electronic trading platforms to incentivize new trading actors, including non-primary dealers, to fill the gap left by primary dealer banks. Evidence for this transformation is discussed further in the next section.

5.3 Putting secondary market transformation in context

Secondary markets for corporate bonds are going through a period of transformation. Understanding the nature of this transformation will be key to identifying any future systemic risk issues. In *Chapter 3,* the yield offered on bonds was separated into its major components – credit (default) risk and inflation compensation (interest rate risk). However, *Chapter 4* noted that the risks associated with investing in corporate bonds include not just 'default risk' and 'interest rate risk' but also 'call risk' and 'liquidity risk'. These risks are also priced into the yields offered on different types of bonds (Figure 33 for an example).[124]

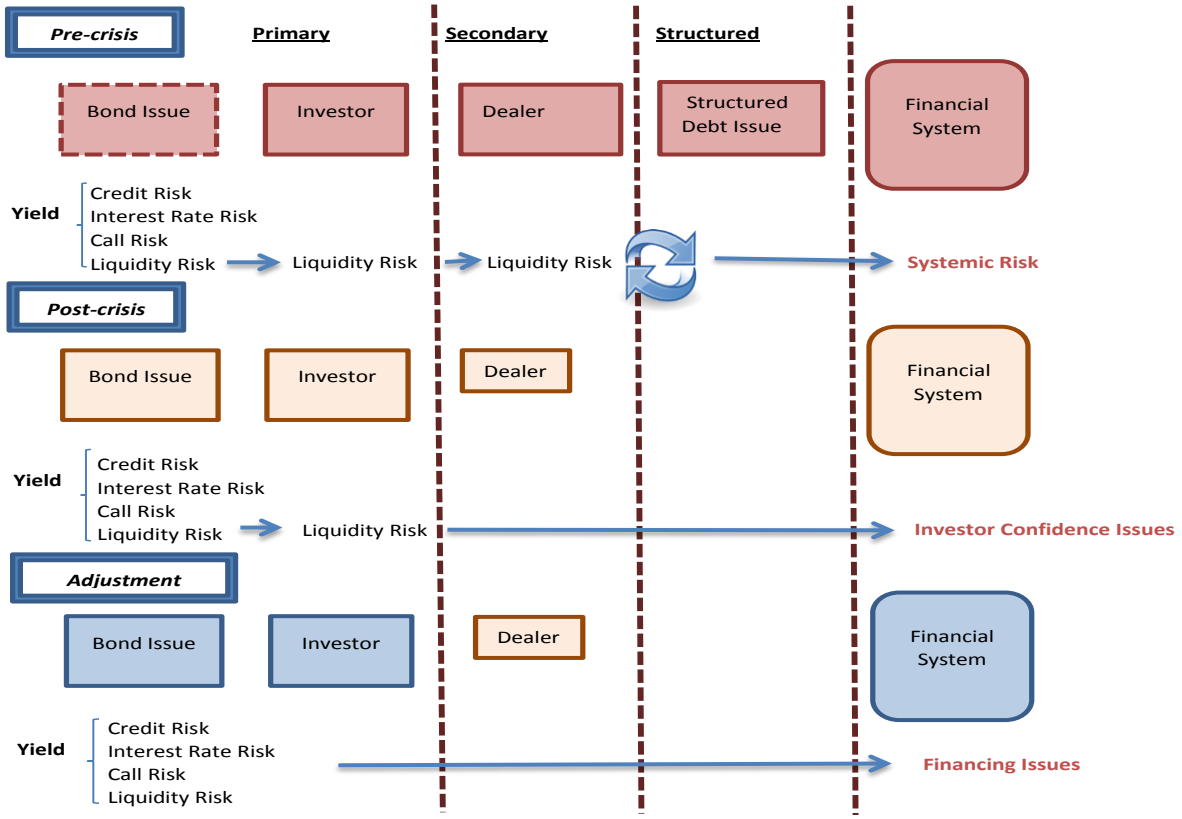
Figure 33: Yield Make-up



While changes in default risk, interest rate risk and call risk are anticipated, transformation in the secondary markets is changing liquidity risk in a way not accounted for in yields or anticipated before and immediately after the crisis broke out. To explain how this transformation is impacting liquidity risk, Figure 34 compares behavior in the pre- and post- crisis period, and outlines implications of this adjustment on investor confidence and corporate financing opportunities.

[124] For example, longer duration bonds, callable bonds and speculative-grade bonds all offer higher yields to compensate for the increase in interest rate risk, call risk and default risk respectively.

Figure 34: Shifting liquidity risk in corporate bond markets



Source: IOSCO Research Department

Before the crisis, dealers provided liquidity to the market, effectively taking on the liquidity risk of bonds so that issuers and investors didn't have to – but converting this into systemic risk through inclusion of illiquid bonds in structured debt products. After the onset of the crisis, and as dealers stepped back from their market-making role, liquidity has decreased and investors now face higher liquidity risk – this could result in investor confidence issues in the case of widespread bond fund redemptions as interest rates rise. To compensate for this increased risk, issuers may have to price the increased liquidity risk into yields offered, increasing their borrowing costs. This could change the composition of financing or introduce financing issues for firms needing to rollover their debt. It will also further depreciate the price of already issued bonds – which do not offer yields reflecting the new liquidity risk.

Secondary markets appear to have, so far, absorbed the bond sell-off of 2013. This could suggest that secondary markets are already transforming to absorb the squeeze on dealer inventories and reducing bond turnover ratio. The 'bond sell-off' of 2013 has provided a 'miniature stress test'[125] of secondary market functioning, allowing exploration of current secondary market liquidity conditions in the context of a changing interest environment.

In May 2013, the United States Federal Reserve's announcement of tapering had a strong effect on the global economy.[126] One of the consequences of this was a bond sell-off in late 2013. According to Lipper, from July 2013 to January 2014, bond funds saw net redemptions (outflows) while equity

[125] See IMF, 'Global Financial Stability Report: Transition Challenges to Stability', October 2013

[126] See IMF, 'Global Financial Stability Report: Transition Challenges to Stability', October 2013

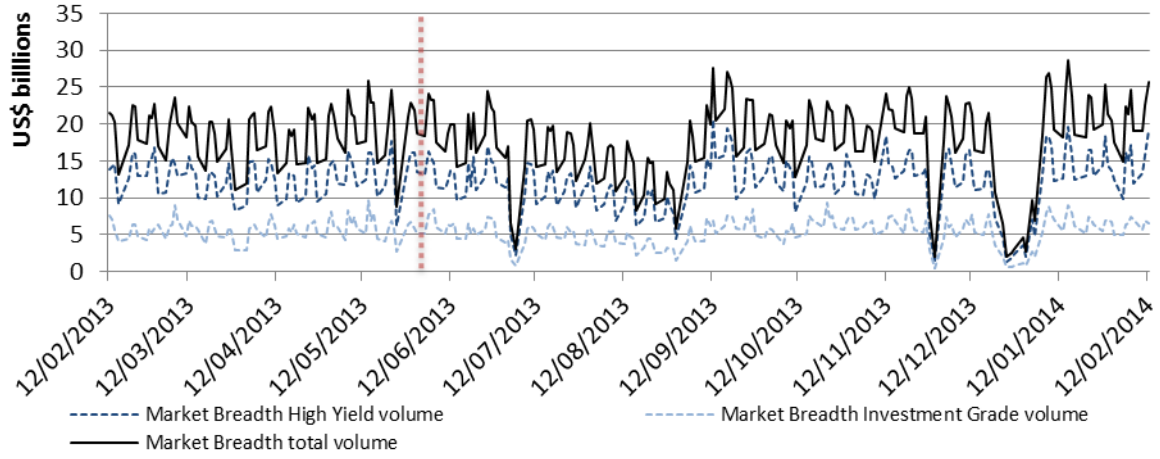
saw inflows.[127] According to research by JP Morgan and data from ICI, in 2013 bond flows dropped to levels seen during the Lehman collapse of 2008.[128]

Figure 35 presents US data on average daily trading volume over this period. In June, July and August after the tapering announcement, average daily trading volume reduced however the number of bonds traded stayed relatively steady through the year, increasing slightly in the second half. This suggests that the average size of bonds traded decreased after the taper announcement. At the beginning of May, average size was around $4 million per trade. In August, average size was around $800 000 per trade. However, by September trading volume had recovered and by the end of the year the average size of bonds traded returned to around $3.5 million.

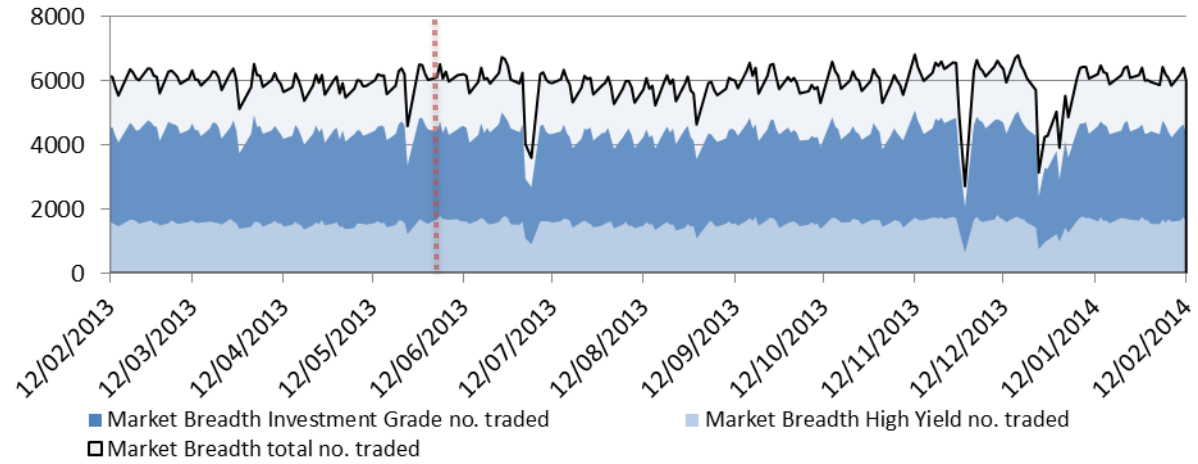
Shrinking dealer inventories and the changing average size of trades may together be indicative of changing behavior and trader profiles in the secondary markets.

Figure 35: US Secondary Market Breadth (average trading Volume)

FINRA TRACE Trading Volume[129]



FINRA TRACE Number of issues traded[130]



Source: Bloomberg, FINRA TRACE Market Breadth data. Note: TRACE has 30 000 eligible bonds for trade – 20% of bonds are traded (c 6000)

[127] Lipper, Fund Flow reports
[128] Nikolaos Panigirtzoglou, Metthew Lehmann, Jigar Vakharia, JP Morgan, 'Flows & Liquidity', 15 Nov 2013
[129] Represents the current day total traded corporate bonds in terms of value
[130] Represents the current day total traded corporate bond issues traded in terms of number

Recent research suggests that electronic trading in corporate bond markets over multi-dealer platforms may enter a renaissance. Yet, electronic trading may require some standardization of issuances to realize its potential. As secondary markets transform, the introduction of centralized, multi-dealer electronic networks is already contributing to increased transparency[131] and in some cases, allowing non-dealers or non-primary dealers to inject liquidity in the market. Traditionally, the heterogeneity of corporate bonds in circulation has made it difficult to introduce such platforms.[132] Yet, cautious optimism has been expressed recently in a number of reports and surveys on the potential of electronic trading to transform the corporate bond markets, as described below:

A recent survey by the Greenwich Associates noted that e-trading as a percentage of trading volume grew by 4% between 2011 and 2012 in the US and 7% in Europe. In 2012, 14% of investment grade corporate bonds were traded electronically in the US and in Europe, 29% e-traded.[133] A TABB Group report released in early 2014 predicts an increase in e-trading of corporate bonds for some niche markets, in the next three years, suggesting that by 2016, 37% of the US corporate bond market will be e-traded.[134] In fact one recent report by McKinsey and Greenwich Associates notes that during the bond sell-off of 2013 (see *Chapter 4*), trading over request for quote, multi-dealer electronic platforms saw record activity.[135] If these platforms continue a move towards 'all-to-all request for quote models' or 'order book' models,[136] they may provide opportunities for a greater range of secondary market traders (including other institutional investors) to step in as price and liquidity makers and fill the gap left by primary dealers.[137] [138]

Nevertheless, without increased standardization in the corporate bond issuances, electronic trading platforms may face challenges in reaching this potential.[139] As such, issuing firms may be incentivized to standardize bond issuance so that they are tradable on electronic platforms, thereby lowering borrowing costs. On the other hand, standardization may erode the tailored nature of corporate bond markets, limiting an issuing firm's ability to secure financing in a customized fashion (See Box 9 for an explanation of the differences between equity and corporate bond markets). Ultimately, as markets transform, issuing firms may choose to either standardize issuance in order to decrease liquidity risk and thus borrowing costs; or continue to issue tailored bonds but at a premium to account for reduced liquidity. This could result in a segmented market similar to equity and private equity markets; or standardized and over-the-counter derivative markets.

Box 9: The differences between equity and corporate bond markets.

Equity and corporate bond markets are sometimes viewed as being in competition. Equity IPOs are typically more expensive to arrange than corporate debt,[140] depending on the jurisdiction. Costs can include underwriter costs, auditing costs, legal costs, taxation and financial reporting. Interest rates

[131] These platforms include MarketAxes, Tradeweb Markets, the Order-Book for Retail Bonds from the London Stock Exchange.
[132] see Jean-Pierre Casey & Karel Lannoo, CEPS, 'Europe's Hidden Capital markets', 2005
[133] Greenwich Associate survey reported in McKinsey Institute, 'Corporate Bond E-Trading: Same Game, New Playing Field, August 2013. The majority of e-trading was reported to take place on multi-dealer RFQ platforms.
[134] Radi Khasawneh, "Corporate Bond Trading 2016: Predicting the Platform Winners", TABB Group, January 2014.
[135] Greenwich Associate survey reported in McKinsey Institute, 'Corporate Bond E-Trading: Same Game, New Playing Field, August 2013. The majority of e-trading was reported to take place on multi-dealer RFQ platforms.
[136] 'Order book' model, has executable pricing and allows non-dealer traders to provide liquidity; the 'request for quote' model uses indicative pricing and only allows dealers to place limit orders; the 'all-to-all request for quote' model allows different types of secondary market participants to enter limit orders.
[137] Brian Scott-Quinn and Deyber Cano, 'European Corporate Bond Trading – the role of the buy-side in pricing and liquidity provision', ICMA, June 2013
[138] See BlackRock, 'Setting New Standards: *The Liquidity Challenge II',* May 2013
[139] See BlackRock, 'Setting New Standards: The Liquidity Challenge II', May 2013
[140] Ross Geddes, 'IPOs and Equity Offering', Elsevier, 2003

do not feature prominently in these calculations, although the broader interest rate environment can have indirect impact on a firm's decision to go public.[141]

When an 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 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. [142] 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.

Further research focus on this secondary market transformation, could support better understanding of how markets are developing, and any potential systemic risk or investor protection issues. Secondary markets globally suffer from low public data availability. Further research could be undertaken to understand how markets are changing by (1) further disentangling the phantom liquidity introduced into the system in order to identify whether 'real' market liquidity is increasing or decreasing; (2) monitoring the uptake of electronic trading platforms globally; and (3) investigating whether and which other actors are stepping in to inject liquidity in the market, in lieu of primary dealers.

[141] Boyan Jovanovic, Peter Rosseau, 'Interest Rates and Initial Public Offerings', NBER Working Paper, February 2004

[142] 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.

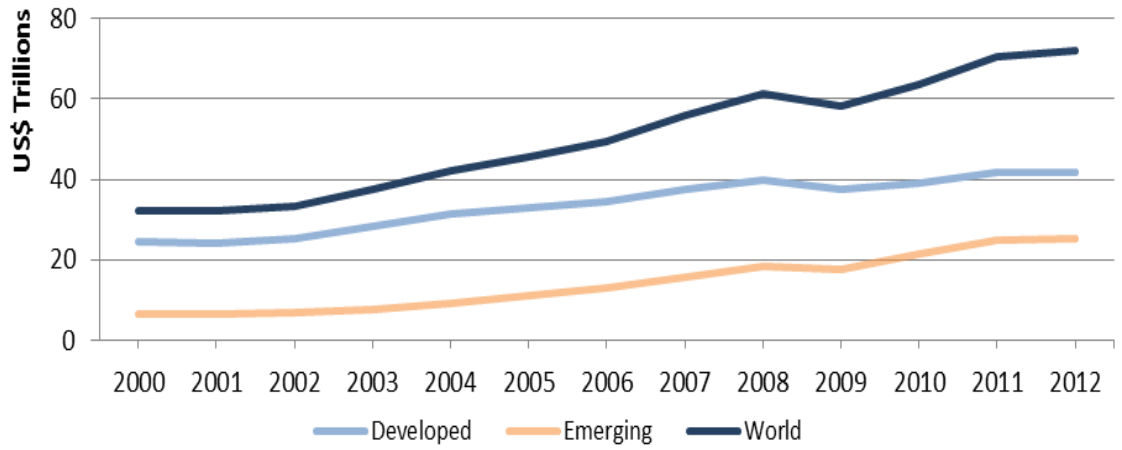
❑ Chapter 6 – A Move towards Market-Based Financing

Corporate bond markets are a key pillar of securities markets and an important part of the larger financial markets (which can be broadly categorized as equity, corporate and sovereign bond markets and bank lending).[143] In fact, with credit institutions now facing higher capital requirements,[144] constraining their ability to lend, [145] securities markets, including corporate bond markets, have been looked to as an important alternative financing channel.[146] Analysis of the data reveals that corporate bond market financing is substituting bank financing for non-financials in some developed markets. Infrastructure financing through corporate bond markets is also increasing. In emerging markets specifically, corporate bond markets could prove an important source of financing for enterprises including SMEs.

6.1 Changes to the global financial stock

Global GDP, a measure of economic health, has slowed with the onset of the crisis. The financial crisis momentarily slowed GDP growth in both emerging and developed markets, with signs of recovery in recent years. Figure 36 compares GDP growth over the last decade in emerging and developed markets. For developed markets, the CAGR before the crisis (2004-2007) was 5%. After the crisis, the growth rate more than halved to less than 2% (hovering around zero and even negative for some economies). Emerging markets, on the other hand, enjoyed a CAGR of around 14% between 2004 and 2007, dropping to just over 8% after the crisis.

Figure 36: GDP Growth for country sample



Source: World Bank Note: Developed and Emerging categories include GDP for countries analyzed in this report only.

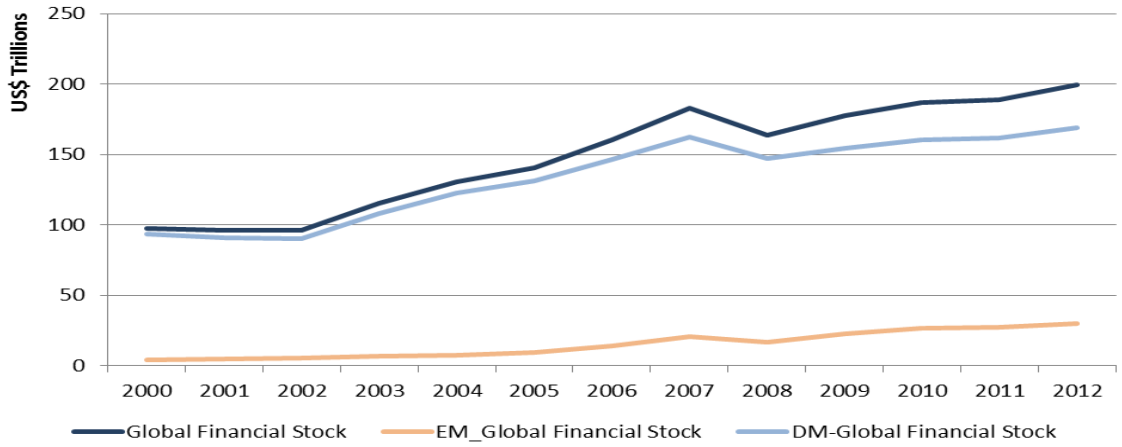
The global financial stock,[147] an indication of the health and recovery of financial markets, has also suffered. However, it continues to grow in the post-crisis period. Global financial stock can be

[143] Derivatives markets also constitute a major part of financial markets, however low data availability means that they are not focused on here.
[144] Basel III, Dodd Frank Act
[145] McKinsey Global Institute, 'Financial globalization: Retreat or reset?', March 2013; Nikolaos Panigirtzoglou, Metthew Lehmann, Jigar Vakharia, JP Morgan, 'Flows & Liquidity', 15 Nov 2013; IOSCO, 'Securities Markets Risk Outlook 2013-2014', October 2013; 'Economic Importance Corporate Bond Markets', ICMA, March 2013; Ernst & Young, 'Eurozone: Outlook for financial services', Eurozone Forecast, 2012/2013
[146] IOSCO, 'Securities Markets Risk Outlook 2013-2014', October 2013; IMF/EBRD/OECD, "Local Currency Bond Markets – A Diagnostic Framework", July 9 2013
[147] For the purposes of this report, which is examining corporate financing, global financial stock does not include government bonds.

measured as the sum of corporate bond total amount outstanding, equity market capitalization and domestic bank credit (loans) outstanding.[148] Figure 37 plots the global financial stock over the last decade, including for emerging and developed markets. In 2004, the global financial stock was valued at $130 trillion. By 2012, the global financial stock reached $200 trillion.

In developed markets, financial stock was valued at $123 trillion in 2004. Before the crisis, this stock had a compound annual growth (CAGR) rate of 7%. After the crisis the CAGR dropped to just 1%, reaching $170 trillion in 2012. In emerging markets, the global financial stock was valued at $8 trillion in 2004 and had a CAGR of 20% before the crisis. After the onset of the crisis the CAGR dropped to 6%, below emerging market GDP growth, bur reaching over $30 trillion in 2012.

Figure 37: Global Financial Stock



Data Source: Equity data based on market capitalization data from the World Bank. Domestic credit data compiled from the world bank. Corporate bonds data based on amount outstanding data compiled from BIS and AsianBondsOnline. Note: Aggregate figures for world derived from – Australia, Austria, Argentina, Belgium, Canada, China, Croatia, Cyprus, Czech Republic, Denmark, Finland, France, Germany, Greece, Hong Kong, Hungary, Indonesia, Ireland, Israel, Italy, Japan, South Korea, Luxembourg, Malaysia, Malta, Netherlands, Norway, Poland, Portugal, Philippines, Russia, Singapore, Slovak Republic, Slovenia, Spain, Sweden, Thailand, Turkey, United Kingdom, United States. Complete and comparable data was not available on corporate bond market outstanding for several large emerging and developed corporate bond markets, including Brazil, Mexico, New Zealand, India and Switzerland, which have grown substantially over this period. Note: DM (Developed Markets in sample and EM (Emerging markets in sample).

Domestic bank credit has been fueling much of the growth in global financial stock. Before 2004, corporate bond markets were small relative to equities markets and bank lending. Since then corporate bond and equity market stock (market-based financing) experienced a period of fast growth between 2004 and 2007. This initial growth in market-based financing was in part due to fundamental changes in the European financial system such as disintermediation and introduction of the euro – culminating in a small shift from largely bank-based financing towards greater use of capital markets. [149] At the same time, high infrastructure and corporate funding demands originated from emerging markets as their countries developed rapidly over the decade. This spurred a jump in the global investment rate.[150]

[148] See McKinsey Global Insitute, 'Mapping global financial markets 2011', August 2011

[149] See Jean-Pierre Casey & Karel Lannoo, CEPS, 'Europe's Hidden Capital markets' 2005. However, a number of European economies are still largely bank-based.

[150] See Richard Dobbs, Susan Lund and Andreas Schreiner, "How the growth of emerging markets will strain global finance", Insights & Publications, Mckinsey Global Institute, December 2010.

In the wake of the crisis, new regulatory initiatives requiring banks to hold more capital have been introduced, constraining the ability of credit institutions to lend to the real economy[151] and leading to speculation over the future role of market-based financing in spurring economic growth.[152] For example, Basel III has been designed to reduce leverage and increase solvency in the global banking sector and thereby reduce systemic risk. The principles do not specifically intervene in lending practices however one of the pillars of this approach is to raise banking capital requirements, which may have further implications for bank lending and the real economy.

Figure 38 disaggregates the global financial stock in developed and emerging markets to present the financial profile of these groups. The data reveals that in 2004 the ratio of bank lending to market-based financing (corporate bond and equity) was 50/50. Yet in 2012, this ratio had swung slightly in favor of bank lending (53% vs 47%).

Domestic credit provision has steadily increased over the last decade. Domestic credit provision averaged a CAGR of 6% between 2004 and 2007. After the crisis, growth slowed to 4% CAGR reaching $105 trillion in 2012. Bank credit experienced a noticeable squeeze in 2008, due to a run by short-term bank creditors following the Lehman Brothers collapse that year.[153] Domestic credit provision in developed markets reflects this global trend. However, in emerging markets domestic credit stock has not been stunted, growing by a CAGR of 14% both before (2007-2012) and after the onset of the crisis (2000-2007).

Conversely, global corporate bond stock, which had been on an increasing trend since 2004, saw flat growth post-2009. Meanwhile, growth in equity market capitalization has turned negative in the post-crisis period. Equity market capitalization actually outperformed both corporate bond and domestic credit before the crisis, increasing from $35 trillion to $56 trillion in 2007[154] with a CAGR of 13%. However, for the period 2007-2012, the CAGR has been negative (-3%).[155] The reduction in equities market stock could be attributable to the turbulence of 2008 which prompted movement into 'safe' sovereign debt markets. Sovereign debt size peaked after the crisis (with the US accounting for nearly one third of sovereign debt increase – Europe and EM sovereign debt increase has been more modest).[156] This sharp increase in sovereign debt issuance came about as developed market governments attempted to stimulate economies and cover bail-out costs. Furthermore, equity IPOs are typically more expensive to arrange than corporate debt.[157]

[151] See PCS, 'Europe in transition: Bridging the funding gap', White Paper, March 2013; McKinsey, 'Between deluge and drought', Working Papers on Risk, no. 41, March 2013

[152] Gert Wehinger, 'Bank delveraging, the move from bank to market-based financing, and SME financing', *OECD Journal: Financial Market Trends*, Vol 2012, no.1, 2012; European Commission, 'Long-Term Financing of the European Economy', Green Paper, 2013; Economic Importance Corporate Bond Markets, ICMA, March 2013

[153] Victoria Ivashina, David Scharfstein, "Bank lending during the financial crisis of 2008", *Journal of Financial Economics*, vol 97, Iss 3, September 2010

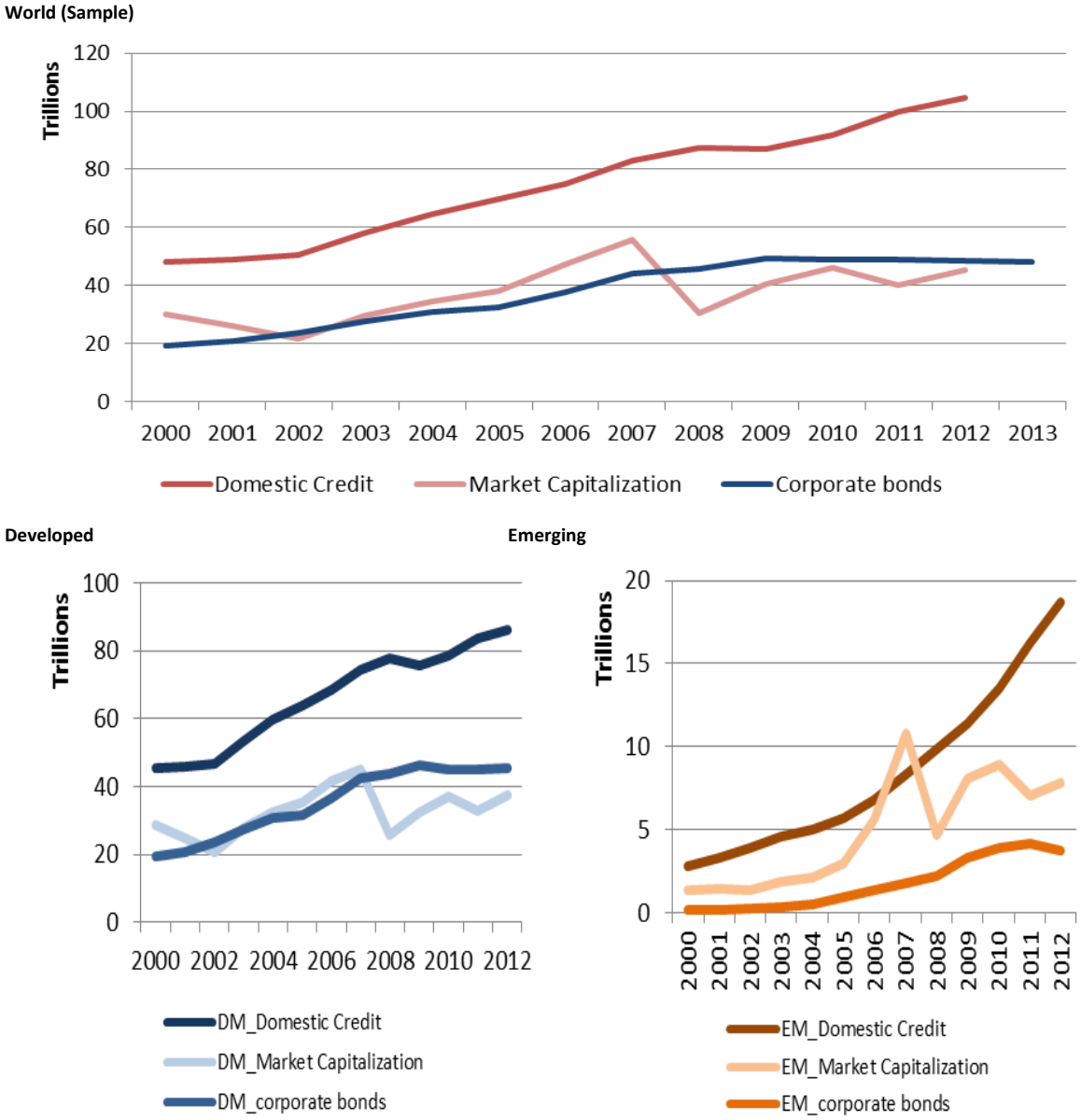
[154] (US$56 trillion according to dataset, US$66.2 trillion globally)

[155] For EMs, the equity CAGR before the crisis was 30% dropping to -5% after. For DMs the CAGR was 6% before the crisis reducing to -3%.

[156] Phil Galdi, "World Bond Market Growth Trends", Bank of America Merrill Lynch, January 2014

[157] Ross Geddes, 'IPOs and Equity Offering', Elsevier, 2003

Figure 38: World, Developed Market and Emerging Market Financing Profiles



Source: Equity data based on market capitalization data from the World Bank. Domestic credit data compiled from the world bank. Corporate bonds data based on amount outstanding data compiled from BIS and ABO (financial and non-financial combined). Note: Aggregate figures for world derived from – Australia, Austria, Argentina, Belgium, Canada, China, Croatia, Cyprus, Czech Republic, Denmark, Finland, France, Germany, Greece, Hong Kong, Hungary, Indonesia, Ireland, Israel, Italy, Japan, South Korea, Luxembourg, Malaysia, Malta, Netherlands, Norway, Poland, Portugal, Philippines, Russia, Singapore, Slovak Republic, Slovenia, Spain, Sweden, Thailand, Turkey, United Kingdom, United States, Vietnam. Complete and comparable data was not available on corporate bond market outstanding for several large emerging and developed corporate bond markets, including Brazil, Mexico, New Zealand, India and Switzerland. Note: DM (Developed Markets in sample and EM (Emerging markets in sample).

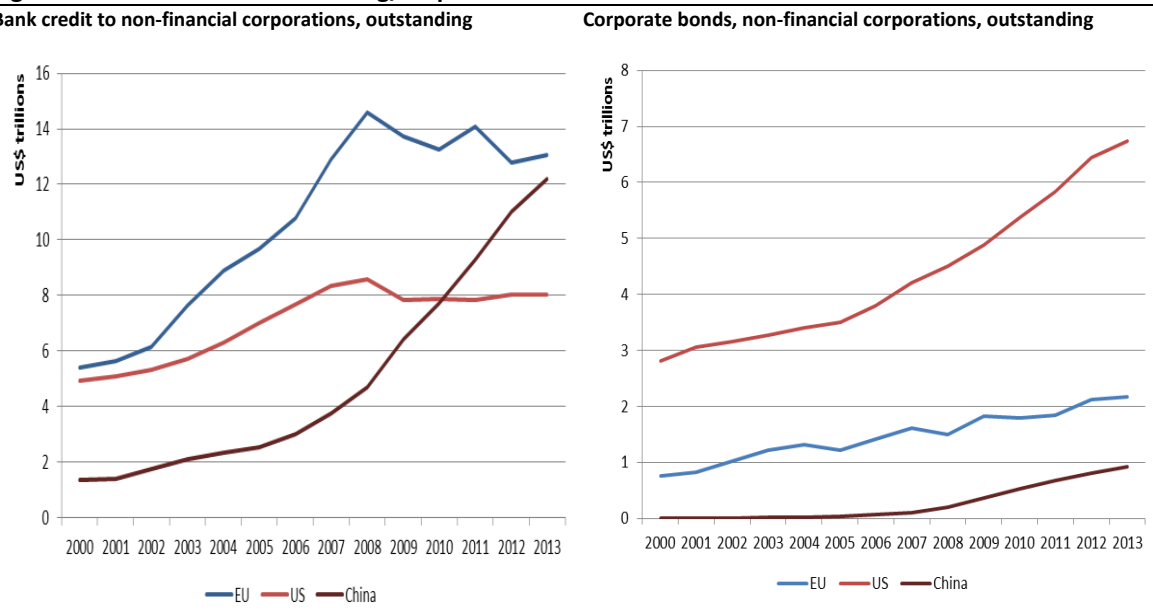
However when it comes to financing the real economy, there is evidence of substitution away from domestic credit provision and towards market-based financing in some developed markets. The global financing figures outlined previously include the outstanding/loans/capitalization held by both financial and non-financial firms. Figure 39 compares bank lending and corporate bonds outstanding for non-financial firms only, a more specific measure of the importance of corporate bond markets in financing the real economy. It reveals that loan provision (amount outstanding) to non-financials in the United States and in Europe[158] has declined since the outbreak of the crisis in

[158] Countries selected due to data availability

2007.[159] In comparison, corporate bond amount outstanding from non-financials has been steadily growing.[160] This may be due to lower costs associated with issuing corporate debt compared with acquiring bank loans.[161]

Yet for China, while corporate bond markets have been growing, domestic credit to non-financials has actually surged over the last 8 years. Figure 39 shows that in China, non-financial corporate bond markets have been booming.[162] In 2013, non-financial corporate bond markets reached $0.9 trillion. However, this growth in corporate bond markets is eclipsed by an explosion in bank lending. Between 2007 and 2013 bank lending to non-financials more than doubled, accumulating around $8.5 trillion in the period and rivalling European levels in 2013. In 2012, bank credit outstanding reached approximately $12 trillion. The explosion in credit is linked to China's stimulus package put in place in 2009, which was funded mainly by bank credit and not government debt (as it was in the United States and Europe).

Figure 39: Evolution of bank lending/corporate debt for non-financials – selected economies



Source: bank credit - BIS Long series on domestic bank credit to the private nonfinancial sector. Converted to US$ using OANDA average annual BID rates. Corporate bond – BIS, domestic debt securities, nonfinancial sector, end data for data June 2013.

While the financial crisis has accelerated a shift towards market-based financing in some developed markets, further research could investigate how this is translating in emerging markets. Volume II and III of this report series will analyze corporate bond market devlopment as well as its relation to bank-based financing at the individual country level, where data is available. The next two sections describe further the implications of this move for infrastructure financing and the financing gap facing small medium enterpries in emerging markets.

[159] Before the crisis (2000-2007) the bank lending sloped upward with the CAGR in Europe at 12% and 7% in the United States. After the onset of the crisis (2008-2013), the lending was flat with the CAGR dropping to -2% in Europe and -1% in the United States.
[160] at a CAGR of 5% in Europe and 7% in the United States after the crisis manifested.
[161] According to 'Low rates spur credit markets as banks lose ground', the BIS Quarterly Review, December 2013, relative borrowing costs of bank loans to corporate bonds increased substantially from 1007 to 2011. In the US bank spreads reached 95% above non-financial corporate spreads. However, by 2013, this gap had disappeared.
[162] with a CAGR of 60% before the crisis and 40%.

6.2 Infrastructure and development financing

Infrastructure financing needs are increasing while banks' ability to provide this long-term financing is decreasing. The financial crisis and slowing economic growth has squeezed public finances. In addition, under Basel III, banks have been tightening lending terms.[163] This means that long-term infrastructure projects may face a potential gap in meeting their financing needs.[164] In developed markets, a number of projects have been put in place to stimulate infrastructure financing.[165] In emerging markets, infrastructure needs are expected to increase dramatically in the next few decades. [166] For some markets such as China and the Middle East, infrastructure projects are mainly funded directly by the government. However, for others, infrastructure financing may be difficult to secure as political risk dissuades cross-border investment into long-term projects such as infrastructure.

Corporate bond market development is going some way to fill this gap. Since the onset of the crisis, there has been an increase in issuance of infrastructure bonds. Infrastructure bonds are issued specifically for infrastructure/project financing and are issued by private firms for infrastructure projects that transcend simple private interests i.e. projects that deliver some public good.

Figure 40 presents the trend in infrastructure financing in both developed and emerging markets. Since 2000, $171 billion worth of infrastructure bonds for project financing have been issued – with $164 billion of this issued in the post-crisis period. Before the crisis, only 15 countries had issued infrastructure bonds. After the onset of the crisis, this number expanded to 39. Over the last 13 years, only 12% of infrastructure issuances have been high yield ($21 billion) and 96% have been long-term.

Issuance volumes in developed markets doubled from $4 billion in 2004 to $8 billion in 2013. In 2013, just over one third of these issuances were high yield. In emerging markets, infrastructure issuances were not recorded before 2006. In 2009, 2010 and 2011 infrastructure bonds in emerging markets soared – reaching $51 billion. By 2013, issuances had subdued equaling $8.2 billion (but still making up 51% of global infrastructure issuances). In 2013, just over one half of these issuances were high yield.

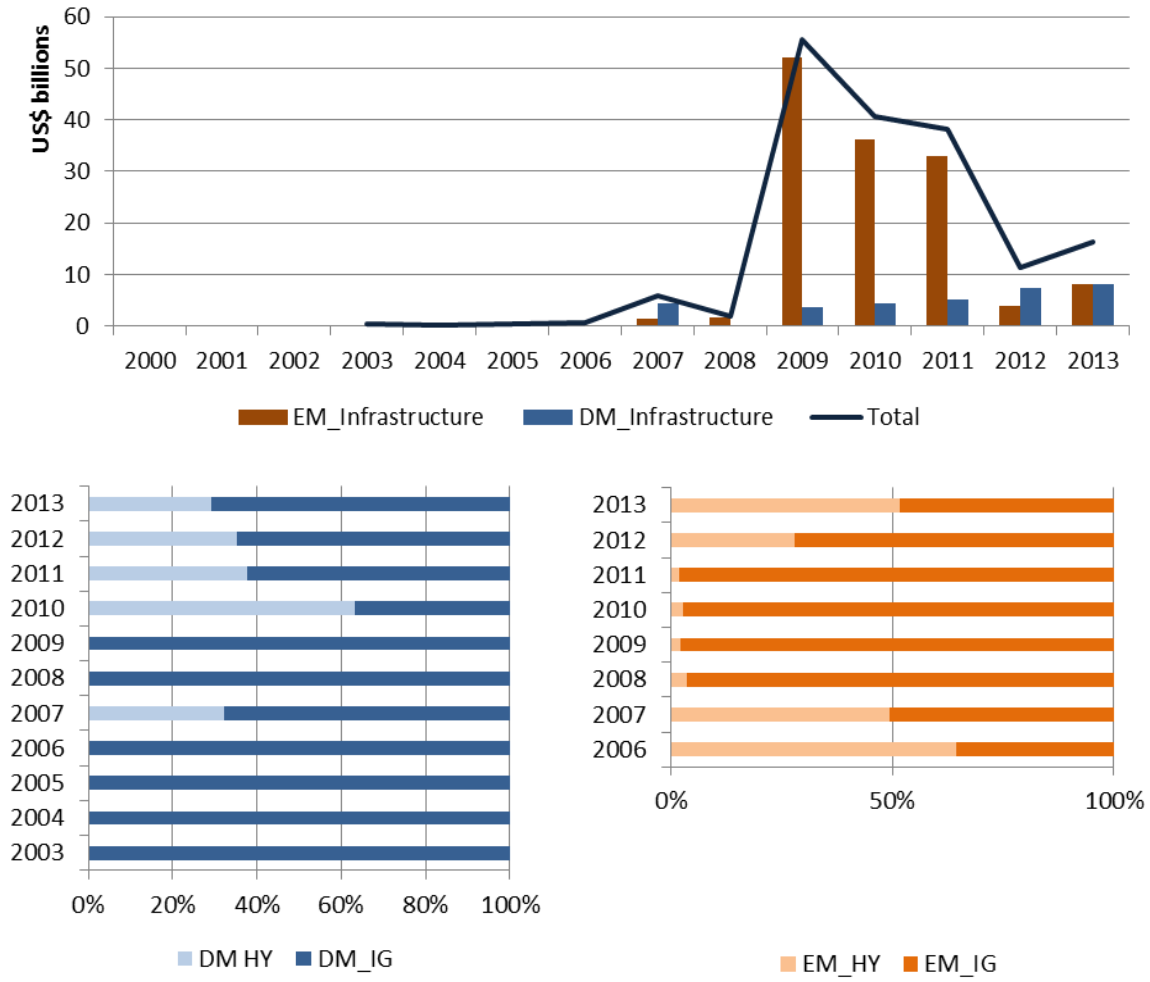
[163] The Net Stable Funding Ratio stipulates a minimum stable funding level for a bank. The purpose of this ratio is to ensure that long-term loans given out by a bank are matched with long-term funding. However, to ensure this long-term funding, banks may have to issue more debt. As shown in this report, financial firm issuance of corporate debt is decreasing rapidly.

[164] PWC, 'Infrastructure investment in the wake of crisis', 2011

[165] In Europe, The European Investment Bank and the European Bank for Reconstruction and Development have stepped in to support infrastructure financing to an extent. A Europe 2020 Project Bond Initiative has been launched, aimed at stimulating capital market financing for infrastructure projects – based on a projected need of EUR 2 trillion in infrastructure financing in 2020. In the United States, state and local governments can attain long-term financing for infrastructure projects at low interest rates and with tax exemption. Furthermore, the Build America bond was introduced in 2009-10 to support bond financing of infrastructure. See Barry Bosworth and Sveta Milusheva, "Innovations in U.S. Infrastructure Financing: An Evaluation", The Brookings Institution

[166] One estimate suggests that infrastructure needs will triple to $1 million by 2030 in emerging markets. See RBS, 'The Roots of Growth: Projecting EM Infrastructure Demand to 2030'

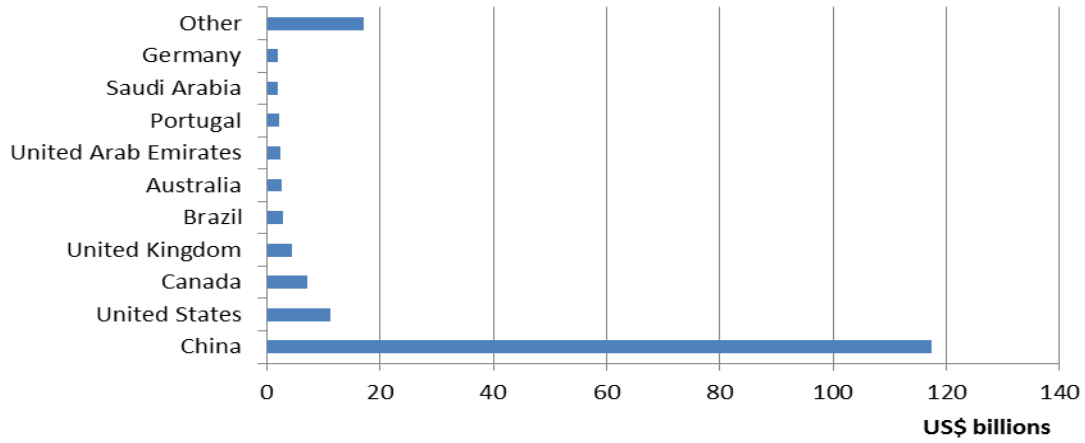
Figure 40: Infrastructure Bond (project financing) issuances



Source: Dealogic. Note: 2013 figure based on data extracted end-September 2013. Note: DM (Developed Markets in sample and EM (Emerging markets in sample).

The majority of infrastructure bond issuances have come from China. Figure 41 shows that China has issued the largest amount of infrastructure bonds, driven by their expansionary policies in the post-crisis period. The US has issued the second largest and Canada has issued the third largest amount.

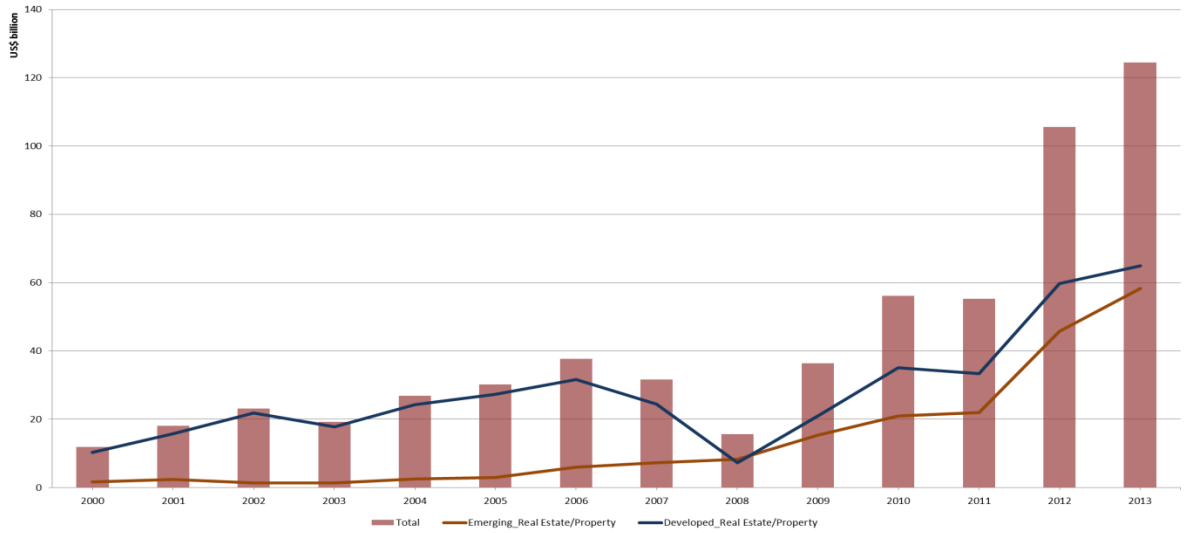
Figure 41: Total infrastructure issuances between 2000 and 2013 – top 10 countries



Source: Dealogic. Note: 2013 figure based on data extracted end-September 2013.

Real-estate/property developers are also increasingly turning to bond markets[167] to finance their activities. Since 2008, bonds issued by real estate/property developers have soared reaching $124 billion in 2013, compared to just $32 billion in 2007. According to Dealogic, more than 60% of these issues were long-term and almost 80% were investment-grade. Furthermore, $1.6 billion of these bonds were issued to retail investors.

Figure 42: Total real-estate/property issuances between 2000 and 2013



Source: Dealogic. Note: 2013 figure based on data extracted end 2013.

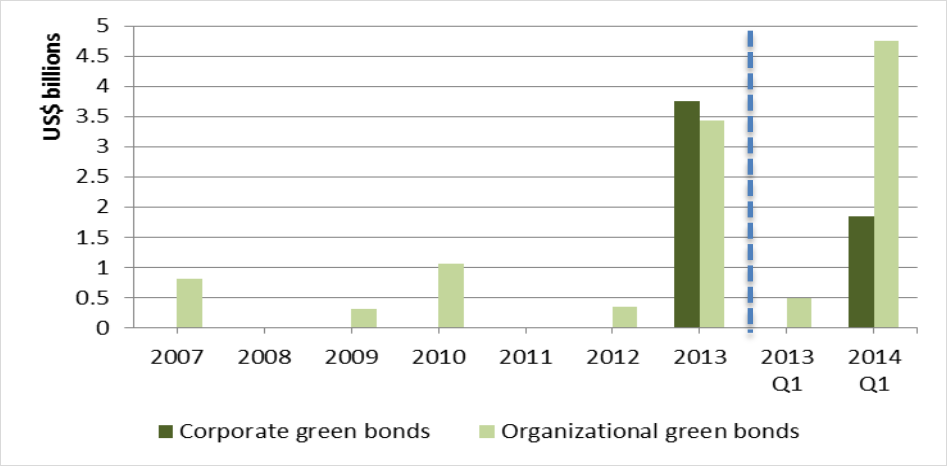
Lastly, bond markets are also being tapped into to finance sustainable development projects and activities. 'Green bonds' are usually tax-exempt, and allow private investors to contribute to the clean energy, green transportation and low-carbon infrastructure projects of corporations and organizations. While still small, the market is growing. They may represent an innovative way of mobilizing finance for sustainable development projects. Importantly, they emphasize the diverse and adaptable world of fixed-income (see Box 10). Further research could investigate the integrity and demand factors in this market.

Box 10: Trends in green bond issuance

Green bonds are a tax-exempt bond. Proceeds are used for specific sustainable projects, to support companies considered 'green' in nature or, in some cases, to improve the sustainability of a corporation's normal operations. Traditionally, such offerings have come from international organizations such as the World Bank, African Development Bank and European Investment Bank. However in 2013, financial and non-financial corporations entered the market as both issuers and investors. Figure 43 tracks green bond issuance since it started in 2007. In 2013, $6.4 billion of green bonds were issued, with $3.8 billion of these coming from corporate issuers. Furthermore, according to Dealogic, $549 million of the corporate issuances came from emerging markets.[168] The investor base for green bonds is also expanding to include not just public-sector institutions such as pension funds, but also insurance firms and asset managers.

[167] For property development, operations, REITs.
[168] China and the Philippines

Figure 43: Green bond issuance



Source: Dealogic

In 2014, a set of voluntary principles for issuing green bonds was released, which recommends how transparency and disclosure can be ensured so that the green bond market maintains its integrity. [169]

6.3 The funding gap for small medium enterprises in emerging markets

SME financing is a global issue. This section focuses on SME financing in emerging markets specifically, in the context of concerns over cross-border flows.[170] Volume III of this report series will analyze SME financing in developed markets, in the context of corporate bond markets.

According to global surveys, SME access to finance has been declining. Small medium enterprises (SMEs) are an integral driver of economic growth and innovation. In developed markets, SMEs employ a large proportion of the population, contribute to development and innovation and help social cohesion.[171] However, in emerging markets a number of surveys and reports confirm increased difficulties for SMEs accessing financing since the onset of the crisis. [172] For example, the IFC global survey of SME access reveals that SMEs especially in emerging markets face difficulties in accessing financing due to lack of financing options.[173] [174]

In a number of emerging markets, procedures for starting up a firm are burdensome.[175] World Bank data on the number of procedures it takes to start-up operations reveals that, on average firms

[169] The principles suggest a process for designating, disclosing, managing and reporting on the procedes of a Green Bond. See, CERES, 'Green Bond Principles 2014: Voluntary Process Guidelines for Issuing Green Bonds' at http://www.ceres.org/resources/reports/green-bond-principles-2014-voluntary-process-guidelines-for-issuing-green-bonds/view

[170] See IOSCO, 'Securities Markets Risk Outlook 2013-2014', 2013

[171] See OECD Scoreboard, 'Financing SMEs and Entrepreneurs'

[172] World Bank Group, Enterprise Surveys Database, 2010.; http://www.enterprisesurveys.org; "World Business Environment Survey" (WBES) of more than 10,000 firms in 80 countries ; also see an additional survey from the RSA and Warwick Business School confirms these findings, reporting that 12% of SMEs report difficulties in obtaining finance in recent years; and another survey of the euro area conducted in 2013 noted that SMEs were reporting an increased need for bank loans and marginal deterioration in availability of bank loans (ECB, 'Survey on the access to finance of small and medium-sized enterprises (SMEs) in the euro area' Survey, 14 Nov 2013); See Dalborg, 'Report on Support to SMEs in Developing Countries through financial intermediaries', *November 2011.*

[173] IFC, 'Scaling up SME Access to Financial Services in the Developing World', FIEG, SME Finance Sub-Group, 2010

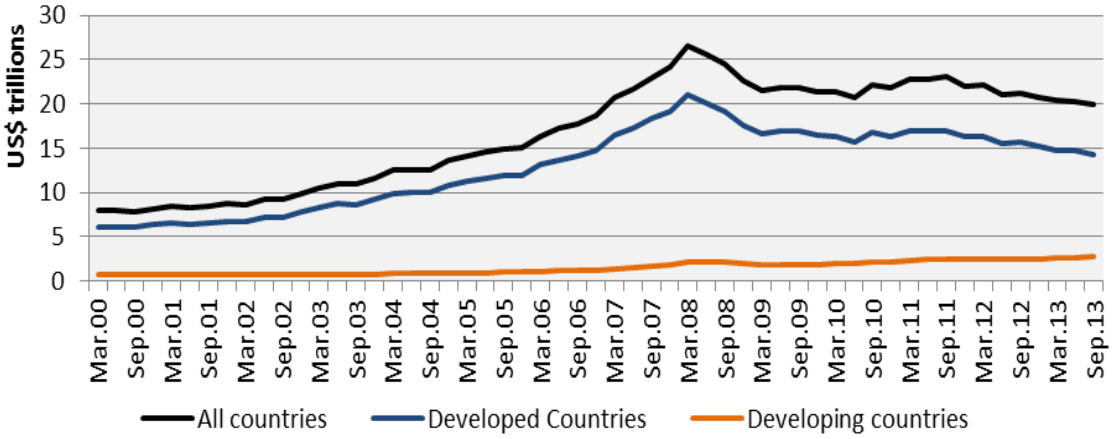
[174] These surveys also suggest difficulties for SMEs in developed markets, especially in Europe, however the focus on this section will be on emerging markets since the evidence is more pronounced. See European Commission, permanent forum on monitoring the market situation for SME financing, initiated 2010.

[175] See World Economic Forum & Boston Consulting Group, 'Redefining the Emerging Market Opportunity', 2012

in emerging markets required 28 days and 8 procedures vs 9 days and 7 procedures in developed markets.

Reduced cross-border bank flows from developed markets may also be creating additional obstacles. SMEs traditionally obtain financing from the banking sector and the share of SME financing through capital markets is small.[176] However, banks in developed markets are, in general, streamlining the countries with and within which they do business in order to comply with new capital requirements and in order to reduce risk exposure.[177] According to a report by the McKinsey Global Institute, Europe accounted for almost half of the global bank flows before the crisis (mostly due to inter-Europe flows). Since the euro-debt crisis, cross border lending from Europe has reduced dramatically.[178] Figure 44 shows a decreasing trend in cross-border bank loans from developed market banks over the last few years. In contrast, cross-border bank loans from emerging market banks have been increasing steadily since the crisis.

Figure 44: External loans of BIS reporting banks

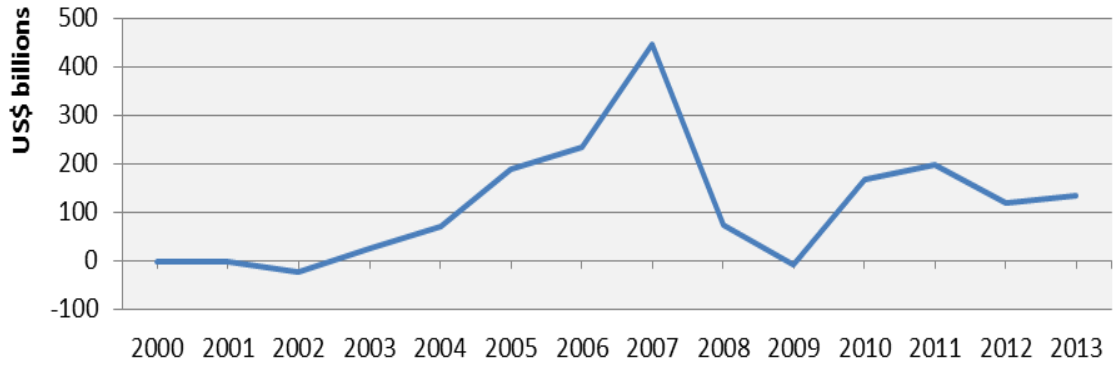


Source: BIS Note: External loans of reporting banks vis-à-vis all sectors

Recent data and reporting from the Institute of International Finance on capital flows (see Figure 45), confirms that despite increased cross-border banking flows from emerging markets, cross-border banking flows to EMs have reduced since pre-crisis highs (2009 levels were almost 6 times smaller than 2007) before rebounding to 2005 levels. In 2012, flows dropped by 41% but increased slightly (by 14%) in 2013.[179]

[176] Dalberg, 'Report on Support to SMEs in Developing Countries Through Financial Intermediaries', November 2011; ICSA Emerging Market Committee, 'Financing of SMEs through Capital Markets in Emerging Market Countries', February 2013.
[177] McKinsey Global Institute, 'Financial globalization: Retreat or reset?', March 2013
[178] McKinsey Global Institute, 'Financial globalization: Retreat or reset?', March 2013
[179] Institute of International Finance, 'Capital Flows to Emerging Markets', 2014

Figure 45: Commercial bank, net flows to selected emerging markets



Source: IIF Graphic: IOSCO Research Department, Note: 2013 data is IIF forecast. Countries include listed in the IIF capital flows user guide: http://www.iif.com/download.php?id=ZbHbVs3YbdA=.

Equity and foreign direct investment (FDI) inflows are also unsteady. Figure 46 traces equity, debt and FDI flows to emerging markets and shows that for selected emerging markets between 2007 and 2013, equity inflows to emerging markets have been on a declining trend, with a CAGR of -11%. For FDI, inflows increased in 2010 but have since reduced to levels below 2007.

In this context, international corporate bond markets may prove an increasingly important financing channel in emerging markets and could go some way towards filling the funding gap facing SMEs. Figure 46 shows that bond inflows to emerging markets have been increasing since the onset of the crisis, even as equity and FDI inflows remain uneven. In 2013 however, debt inflows experienced a decrease.

Calculations by the McKinsey Global Institute suggest that SMEs in emerging markets are experiencing a $2 trillion funding gap.[180] Some studies suggest that a well-developed corporate bond market can and has been helping to bridge this funding gap, providing a relatively stable source of financing as international investors search for yield.[181] A number of platforms have been developed to facilitate SME access to corporate bond markets in both emerging and developed markets.[182] SMEs are also choosing to issue on equity crowd funding and peer-to-peer credit platforms, which are relatively cheap and easy to tap into.[183]

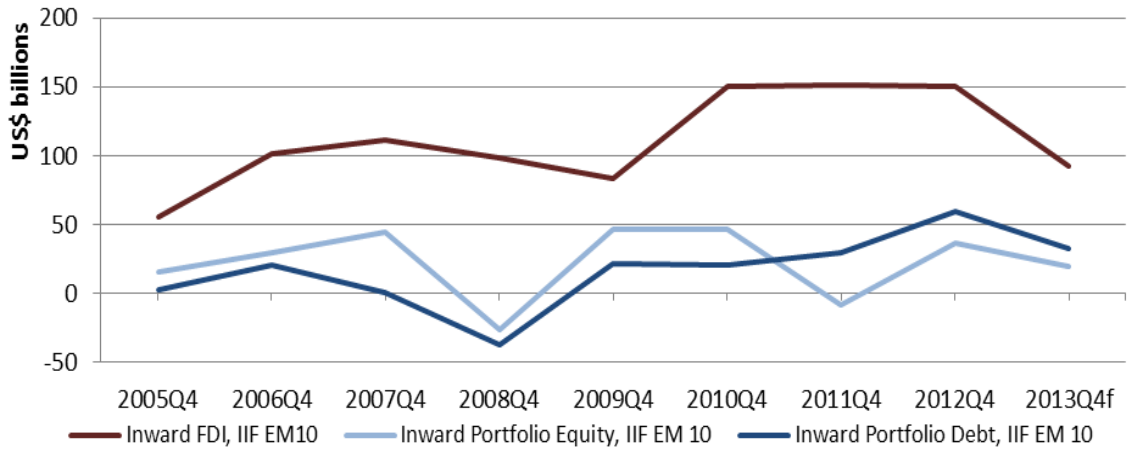
[180] McKinsey Global Institute, Financial globalization: Retreat or reset?, March 2013

[181] Nils H. Hakansson, 'The role of a corporate Bond Market in an Economy – and in Avoiding Crises', Dec 1998: McKinsey Global Institute, Financial globalization: Retreat or reset?, March 2013; ICSA Emerging Markets Committee, "Financing of SMEs through Capital Markets in Emerging Market Countries", February 2013; Jae-Ha Park, Byung-Chul Lim, Jung-Han Koo, Korea Institute of Finance, 'Developing the Capital Market to Widen and Diversify SME Financing: The Korean Experience', 2008; Gert Wehinger, "Bank deleveraging, the move from bank to market-based financing, and SME financing", OECD Journal: Financial Market Trends, Vol 2, 2012; Standard and Poors, 'The Future of Corporate Funding: Filling the Leveraged Loan Gap in Europe", Dec 15, 2011

[182] Including the QIB market for professional investors in South Korea; in a number of SME-targeted bond platforms attached to European stock exchanges; in China, the regulator started a pilot scheme for private placement bonds to SMEs in 2012, in 2013 this platform was expanded to cover a wider region and more companies.

[183] See Eleanor Kirby, Shane Worner, 'Crowd Funding: An infant industry growing fast', IOSCO Research Department Staff Working Paper, 2014 for further discussion on the trends, opportunities and risks present in this market segment.

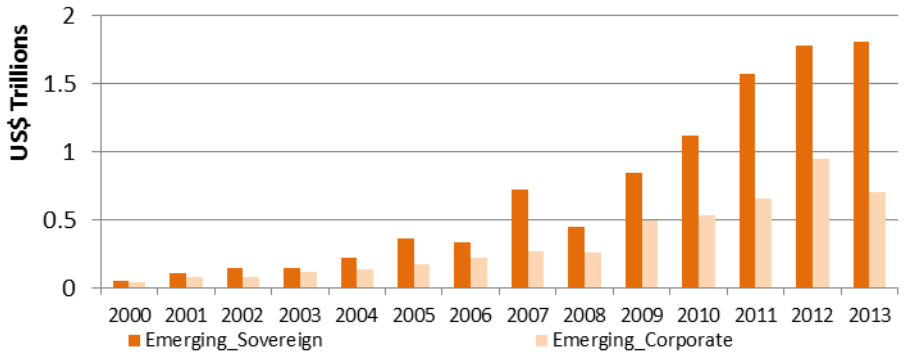
Figure 46: FDI, equity and debt inflows, net for selected emerging markets



Source: IIF, Note: Based on inflows to BRICS, Turkey, Mexico, Chile, Poland and Indonesia. 2013 is a forecasted figure.

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 47 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 47: Sovereign vs. corporate bond issuance – Emerging Markets



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

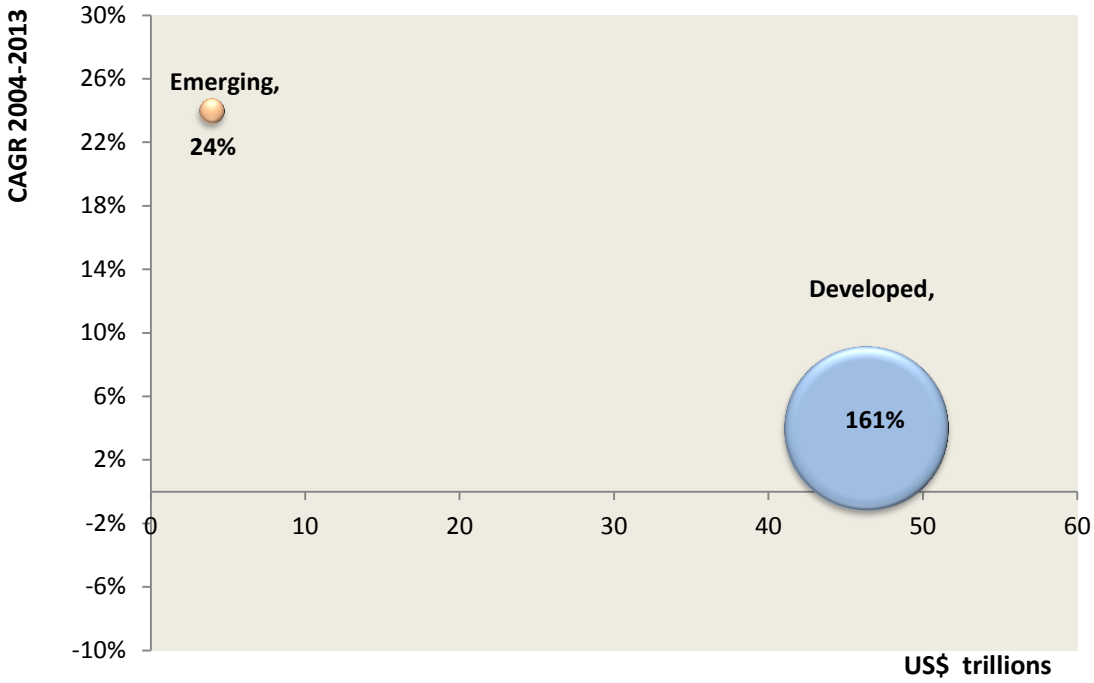
Further research could explore how corporate bond markets can contribute to long-term financing needs in emerging markets, including for SMEs. Such research could also identify obstacles to accessing capital markets for SMEs – helping to bridge any funding gap in the longer-term.

❑ Chapter 7 – Conclusions and Issues for Further Research

The size, distribution and nature of corporate bond markets globally have changed significantly over the last decade, and especially since the onset of the crisis.

Corporate bond markets around the world have increased in size and depth and have improved in terms of access and issuance activity. While corporate bond markets in developed markets are responsible for the majority of global amount outstanding, emerging markets have also been growing. Figure 48**,** compares corporate bond market size in 2013 (in US$ trillions) on the horizontal axis, with the compound annual growth rate of corporate bond markets between 2004 and 2013 on the vertical access. The size of the bubble is linked to average market depth across the country samples. The Figure shows that while developed market corporate bond markets are larger than emerging markets ($46 trillion vs $3 trillion) emerging markets are growing in size at a faster CAGR than developed markets (23% CAGR vs 4%). Market depth is on average 24% in emerging markets vs 161% in developed markets.

Figure 48: Corporate bond market size and growth – emerging vs developed markets



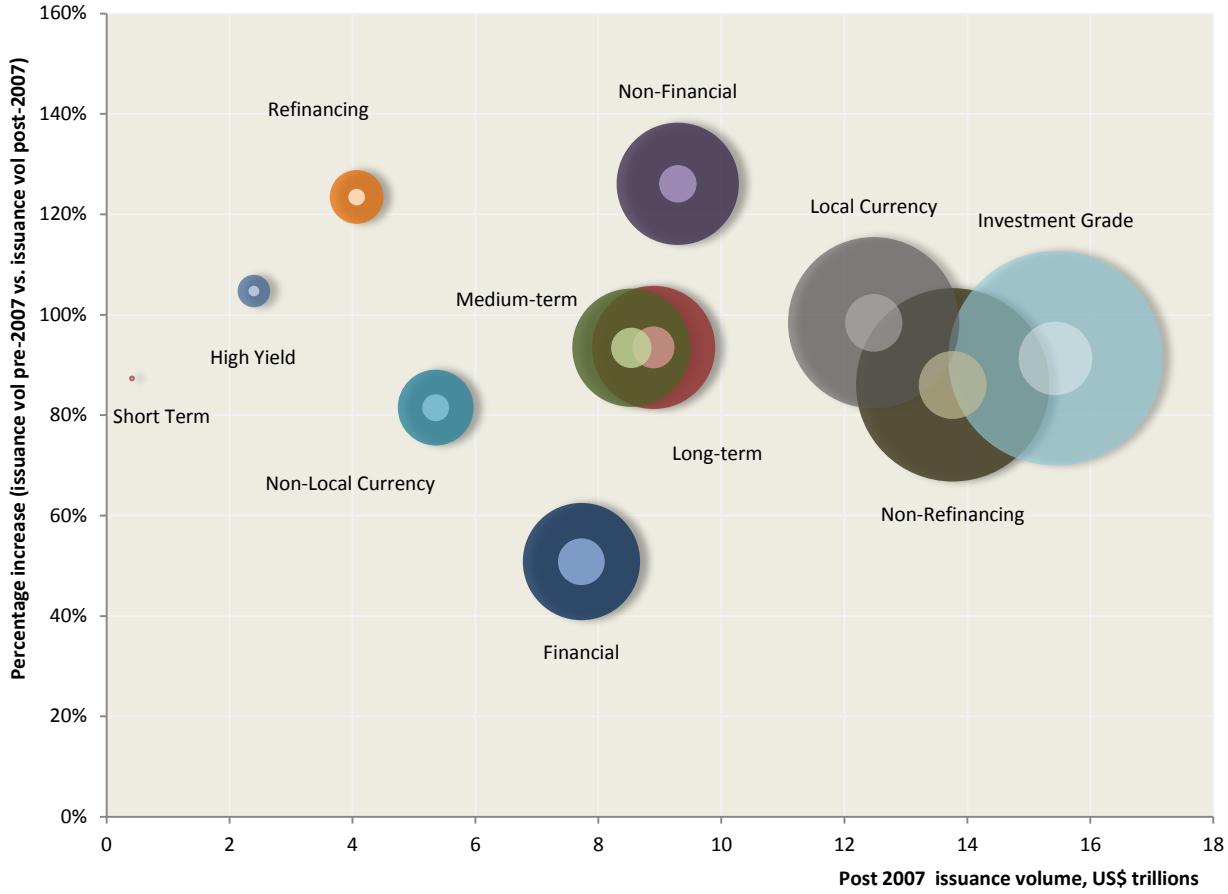
Source: BIS and ABO data on amount outstanding, IOSCO Research Department calculations.

Issuance and issuer characteristics of corporate bond markets have also undergone some changes – especially since the onset of the crisis. Figure 49 provides a summary of issuance and issuer characteristics presented in this report, comparing the pre-crisis period with the post-2007 period. The horizontal axis presents the sum of all corporate bonds issued during the period 2007-2013 i.e. after the onset of the crisis.[184] The vertical axis presents the percentage increase of this sum compared to the sum of all corporate bonds issued during the period 2000-2006 i.e. the pre-crisis period. Effectively, it indicates how the nature of corporate bond issuance has changed since the

[184] Annualized based on end Sep 2013 data.

onset of the crisis. The size of the bubble is based on the absolute volume of issuances. The smaller bubble relates to total issuances for 2000-2006 and the larger bubble is based on the total issuances for 2007-2013. This summary of the data indicates that the majority of issuance types since the onset of the crisis have been investment-grade, for non-refinancing purposes and in local currency. These issuances are predominantly from non-financial issuers, although before the crisis issuances from financial issuers were greater. Most issuances are long-term or medium-term. Non-financial issuances and issuances for refinancing purposes have grown the most compared to pre-crisis levels. High yield and refinancing issuances are higher in the post-crisis period but still make up a small proportion of total issuances.

Figure 49: pre-2007 and post-2007 issuance volumes, categorized



Source: Dealogic. IOSCO Research Department calculations.

Corporate bonds incur risks, which are priced into the yield offered: call risk, default risk, interest rate risk and liquidity risk. The number of bonds with a call option embedded is increasing, especially in developed markets, which may be indicative of increased business optimism or a desire for flexibility in an uncertain economic and regulatory environment. Interest rates are also anticipated to continue increasing as recovery picks up and Central Banks begin to ease out of loose monetary policies. The interest rate risk will affect the value of investment grade bonds more than high yield bonds on the secondary market. Default risk has been low over the last few years, compared to non-performing loans. Liquidity risk could exacerbate the depreciation of these bonds if investors rush to sell their bonds on an illiquid market.

A preliminary review of secondary market functioning suggests that 'phantom liquidity' is drying up. The bond sell-off of late 2013 suggested little sustained impact on secondary market activity. Instead, secondary markets appear to be transforming to adapt to a new regulatory environment, where dealer inventories are somewhat squeezed and electronic trading platforms are beginning to provide some transparency and entry for other types of traders. Further research could focus further on the nature and requirements of this transformation.

Corporate bond market development is happening in the context of slowing GDP growth since the onset of the crisis, despite some signs of recovery in recent years. The global financial stock has also suffered. Nevertheless, it is clear that the financial crisis has accelerated a shift towards market-based financing when it comes to the real (non-financial) economy. Infrastructure financing through corporate bond markets is also increasing, while public finances are squeezed and banks' ability to provide long-term financing is decreasing.

Corporate bond markets may also have an important role to play when it comes to providing financing to SMEs in emerging markets. Reduced and unsteady cross-border bank, equity and FDI flows to emerging markets are in contrast with stable bond inflows. Strong government bond issuance in emerging markets appears to be supporting corporate bond market activity. Future research could explore further how corporate bond markets can contribute to financing needs in emerging markets, including for SMEs.

Areas for further research

There are a number of areas that may benefit from further research from a market efficiency, investor protection and systemic risk perspective, especially as (1) corporate bond markets continue to develop to meet a broad range of financing needs; (2) face a changing interest rate environment; and (3) see transformation in the secondary markets. Further research may choose to monitor and/or explore in-depth:

(1) Why some emerging and developed markets enjoy both large and deep markets, while others do not e.g. tax regimes, regulation, infrastructure, rule of law, corporate governance etc.;

(1) Puttable, PIK, CoCo and Write-down bonds. As these markets continue to grow, further research could investigate the different structures and features of these bond contracts and analyze how they may perform during periods of markets stress – from a systemic risk and investor protection perspective;

(2) The nature of investment in corporate bond markets by retail investors;

(3) The increasing potential for corporate bond markets to support long-term financing and SME financing going forward – in both developed and emerging markets;

(4) The potential for crowding out of corporate financing opportunities, including through corporate bond markets, when accommodative monetary policies come to an end - and what this may mean for economic growth;

(5) Developments in secondary markets including electronic trading, the impact of phantom liquidity on market functioning and the potential impact on corporate bond markets from the anticipated end to the low-interest rate environment;

Furthermore, data and information gaps abound and aggregate figures may be masking the diverse and nuanced performance of corporate bond markets (and financial markets more broadly) in different countries. The following data gathering exercises cold assist in continued monitoring an enhanced understanding, going forward:

- Comparable data on corporate bond amount outstanding (both financial and non-financial) for a number of EMs and some DMs.
- A comprehensive and global breakdown of bid-ask spreads in secondary markets.
- Disaggregated issuer default rates for a number of DMs and EMs
- Secondary market trading data for a wider set of EMs and DMs.
- Bondholder (investor base) makeup and concentration – at the global level.
- An expanded dataset on net fees, including those faced by retail investors.
- Use of electronic platforms for secondary market trading.

Volume II and III of this report series will supplement this volume, providing data and indicators at an individual country and regional level. IOSCO's Regional Committees and IOSCO's Growth and Emerging Market Committee are already designing, in conjunction with the IOSCO Research Department, a *securities markets data gathering project*. This project will focus on collecting useful and comparable data across a number of emerging market jurisdictions, in order to assist IOSCO members in gaining a more comprehensive picture of global securities markets development. Furthermore, the IOSCO Research department has launched a statistics websites, which tracks trends in corporate bond markets.[185] This is updated on a monthly basis.

[185] See http://www.iosco.org/research/index.cfm?section=statistics

ANNEX A – Definition of selected terms and data sources

Term/indicator	Description	Data Source
Corporate bond market size	Based on corporate bond outstanding for countries included in the sample and where data is available from BIS or Asian Bonds Online. Amount outstanding refers to the value of bonds that are still owed at a given time and represent the total stock of corporate bonds. Market size data is divided into 'non-financial' and 'non-financial and financial combined'. ABO data includes foreign and local currency outstanding. It includes the sum of financial and non-financial and non-financial only. BIS data includes the sum of financial and non-financial bonds outstanding and non-financial only.	Bank of International Settlements (BIS), Asian Bonds Online (ABO), Securities Industry and Financial Markets Association (SIFMA).
Corporate bond market depth	Depth refers to the amount of corporate bonds outstanding as a percentage of GDP. This indicator provides a rough measure of the extent to which corporate bond markets have grown relative to the rest of the economy, and as such, whether they have become (a) deeper and more liquid, (b) have simply grown in line with GDP growth, or (c) have failed to increase in size despite rising GDP.	GDP data was sourced from the IMF, and includes IMF projections. Aggregate figures calculated from countries in the sample only. Based on corporate bond outstanding (financial and non-financial combined).
Corporate bond market issuance	Issuance volume refers to the amount of bonds issued by corporates domiciled in a country or group of countries. Issuance volumes were obtained in US dollars, as deal proceeds,	Dealogic Does not include: preferred share, asset-backed, mortgage-backed, sovereign, local authority, supranational, covered, US agency, non-US agency, medium-term note, short-term debt, money market.
Heat map of corporate bond total issuance 2007-2013	Total issuance calculated over the period 2007 and 2013, by country. This indicator provides insight into which countries have issued the most corporate bonds in the post-crisis period. Grey areas represent countries where data could not be sourced. Issuance calculated in US dollars, as deal proceeds	Dealogic
Corporate bond market activity relative to the economy	Total yearly issuance volumes as a percentage of GDP have been used as an indicator of market activity relative to the economy.	Issuance volumes sourced from Dealogic. GDP volumes sourced from the IMF. Aggregate figures calculated individually from the countries in the sample.
Financial Issuance vs Non-Financial Issuance	13 year times series. Used to evaluate the importance of corporate bond markets to the real economy as a direct source of credit.	Dealogic data (issuance by financial and non-financial corporations, measured in deal

		proceeds and billions of US dollars)
Local Currency Issuance vs Non-Local Currency Issuance.	13 year time series. Provides insight on the vulnerability of issuers and investors to foreign exchange risk, and the vulnerability of markets to capital outflows in the event of a changed interest rate environment.	Dealogic data (local and non-local currency denominated issuance volumes, measured in deal proceeds and billions of US dollars)
Investment Grade vs High Yield Corporate Bond Issuance.	13 year time series. Used to evaluate the strength of corporate issuers in each market, and whether the risk appetite of investors has changed. High yield issuances are associated with higher risk.	Dealogic data (measured in deal proceeds and billions of US dollars)
Issuance to Refinance or Repay Existing Debt vs. Other issuances	13 year time series. to understand the importance of corporate bond markets to business expansion, the strength of issuer cash flows, and whether corporates are rushing to refinance debt while current low interest rate conditions persist.	Dealogic data (issuance for purposes of refinancing or repaying existing corporate debt, measured in deal proceeds and billions of US dollars). Other issuances calculated by subtracting refinancing issuances from total issuances.
Issuances for retail investors	Issuance Intended for Purchase by Retail or wholesale Investors is based on analysis of 13 year times series on issuances intended for purchase by retail investors. In order to broadly assess whether retail investors are purchasing corporate bonds, and if so, what proportion of the total investment base they represent.	Dealogic data (measured in deal proceeds and billions of US dollars). Filtered from the database using the 'retail investor Y/N' filter. Wholesale investors calculated by subtracting retail issuances from total.
Bond Fund flows	Bond fund flows represent net flows (inflows and outflows) into corporate bond funds.	International Capital Institute (ICI). Long-term Mutual Fund data.
Corporate and Government Bond Maturities	Maturities refer to the year in which bond issuers have to repay bondholders back their invested principal. This data provides a broad indication of when existing corporate and government issuers may again wish to access securities markets, in order to refinance or roll-over existing issuance. It also provides an indication of how long investors are locked-in to current fixed income investments.	Dealogic data (for corporate bond maturities) and Bloomberg data (for sovereign bond maturities).[186] Data for bonds due to mature between 30 September 2013 and end of 2023.
Maturity term	The maturity term refers to how long issued bonds in any given year, have till they mature.	Dealogic data (deal value proceeds and number of bonds). Filtered by high yield/investment grade and years to maturity.
Infrastructure bonds (project	Infrastructure bonds are used to fund infrastructure-based projects such as building roads, hospitals,	Dealogic data (deal value proceeds)

[186] Data from Dealogic on government bond maturities was assessed by the authors of this report, and found to be less comprehensive than the Bloomberg data.

financing)	telecommunication cables etc. They are usually longer-term and considered risky.	
Default rates	Default rates refer to the percentage of outstanding bonds for which the issuer has defaulted, in a given year.	Data from Moody's investor services on global default rates[187]
Corporate and Government bond turnover ratio	Calculated as: $$\boldsymbol{Turnover\ ratio} = \frac{\boldsymbol{annualized\ trading\ volume}}{\boldsymbol{corporate\ bond\ outstanding}}$$ This indicator provides a broad measurement of secondary government and corporate bond liquidity.	US figures from TRACE data on average daily US trading volumes, annualized. For China, Indonesia, Japan, Malaysia, South Korea and Thailand, ratios have been directly sourced from Asian bonds online.
Global Financial Stock (non-government) and Financing Profile	In this report global financial stock includes corporate bonds outstanding, equity market capitalization and bank credit to the private sector, but excludes sovereign bonds outstanding: $$\boldsymbol{GFS = CorpBondx_{Outstanding} + Equityx_{Marketcap} + BankLoansx_{Domcredit}}$$	Corporate bond outstanding is sourced from the BIS and Asian Bonds Online. Equity market capitalization and Domestic Credit is sourced from the World Bank. [188] Data aggregated from countries in the sample only. In US$ billions.
Evolution of bank lending/corporate debt to non-financials	Based on bank loans (outstanding) and corporate bonds (outstanding) to non-financials. This is a stock indicator which shows trends in the amount of financing through bank lending for non-financial vs. the amount of financing through corporate bonds by non-financial.	BIS Long series on domestic bank credit to the private nonfinancial sector, end data Dec 2013. BIS, domestic debt securities, nonfinancial sector, end data for data June 2013. Converted to US$ using OANDA average annual BID rates.
Domestic credit as % of GDP	Provides an indication of the importance of bank Credit to the private sector, relative to the real economy. Description from Worldbank.org: Domestic credit provided by the banking sector includes all credit to various sectors on a gross basis, with the exception of credit to the central government, which is net. The banking sector includes monetary authorities and deposit money banks, as well as other banking institutions where data are available (including institutions that do not accept transferable deposits but do incur such liabilities as time and savings deposits). Examples of other banking institutions are savings and mortgage loan institutions and building and loan associations.	Countries included in all aggregate/regional figures are based on World Bank predefined categories and not the sample for this report.

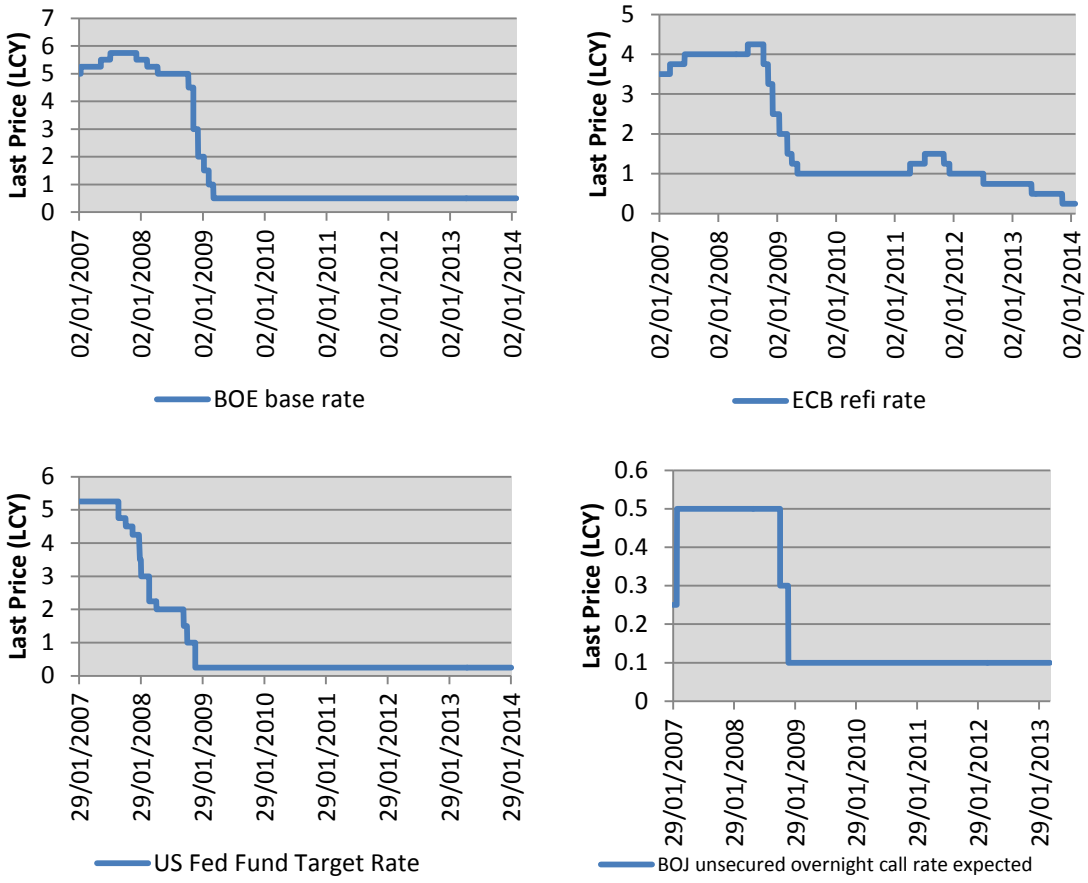
[187] See Moody's note on measuring default rates: https://www.moodys.com/sites/products/DefaultResearch/2006200000425249.pdf
[188] Bloomberg. Bloomberg data only captures trades executed through Bloomberg.

Sovereign vs. corporate bond issuance	Sovereign or government bonds are bonds issued by a national government for refinancing purposes or to fund certain activities. Corporate bonds are bonds issued by financial or non-financial corporations for refinancing, expansion or to fund certain activities. This data has been used to provide an indicator of public debt levels, and sovereign exposure to financial market liquidity.	Sovereign issuance data from Bloomberg. [189] Corporate bond issuance data from Dealogic. Groupings aggregated from country sample only.
External loans of BIS reporting banks	Loans outstanding from domestic banks to external (non-domestic) borrowers.	BIS data, external loans of reporting banks vis-à-vis all sectors.
Commercial bank, net flows to selected emerging markets	External lending from commercial banks to selected emerging markets.	Institute of International Finance data
FDI, equity and debt inflows, net for selected emerging markets	Dollar value of Foreign Direct Investment (FDI), debt (bon) inflows and equity inflows to selected emerging markets.	Institute of Institute of International Finance data
Emerging market Currencies	Emerging market currencies against the U.S. dollar. An increasing ratio means a decreasing currency value relative to the US dollar.	Bloomberg data – FX matrix
Policy interest rates for selected countries	Short-term interest rates set by the central bank.	Bloomberg data.
Dealer Inventories of corporate bonds, US	Primary Dealer holdings of corporate bonds in US dollars.	New York Federal Reserve.
Annual Average Trading Volume	Annualized data based on average daily trading volume of corporate bonds on secondary markets.	SIFMA
US Secondary Market Breadth	Represents the current day total traded corporate bonds in terms of value and number of bonds traded.	FINRA TRACE measurement of Market Breadth via Bloomberg.

[189] Dealogic data on sovereign issuance was also evaluated by the authors of this report, and found to be less comprehensive than the Bloomberg dataset.

ANNEX B – Policy interest rates

Figure 50: Policy interest rates for selected countries



Source: Bloomberg

ANNEX D – List of Figures