



Securities Markets Risk Outlook

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*The potential systemic risks identified in this Outlook are based on a number of information gathering exercises of the IOSCO Research Department and discussions with the IOSCO Committee on Emerging Risks. The identification and descriptions of risks in this report is based on the judgment of the IOSCO Research Department alone and not of the IOSCO membership.

As such, the assessment of the potential systemic risks in this Outlook should be interpreted as the views of the authors and does not necessarily represent the views of IOSCO, the IOSCO Board, its committees, task forces or its broader membership. Information and opinions presented in this note have been obtained or derived from sources believed by the authors to be reliable. All dollar figures are in US dollars, unless otherwise stated.

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ABOUT THIS DOCUMENT

This *IOSCO Securities Market Risk Outlook 2014-15* (the Outlook) is the second publication in an annual series of Outlooks that aim to identify and assess potential systemic risks from securities markets. The Outlook is a forward-looking report focusing narrowly on issues relevant to securities markets and whether these may be, or could become, a threat to the financial system as a whole.

This Outlook is based on a number of inputs including: data collection and analysis; construction of quantitative systemic risk indicators; market intelligence interviews for major financial centres; risk roundtables with members of industry and regulators; a survey of experts on emerging risks;¹ analysis from academia and the regulatory community; and risk reports and presentations by experts. The Outlook synthesises these inputs to adopt a global and forward-looking approach to understanding risks that could become systemic and to highlight noteworthy trends and potential vulnerabilities.

The purpose of the annual Risk Outlook is three-fold. First, it is intended to inform the IOSCO Board² and other IOSCO members about potential systemic risks to securities markets. The Outlook is meant to assist regulators in implementing IOSCO's principles on (i) identifying, assessing and mitigating systemic risk (Principle 6), and (ii) on reviewing the regulatory perimeter (Principle 7). Second, it contributes perspective on securities markets to the risk identification and mitigation efforts by the Group of Twenty (G20), the Financial Stability Board (FSB), the International Monetary Fund (IMF) and other global organisations that are tackling similar issues. Third, the Outlook raises public awareness of key issues and potential systemic risks in securities markets.

This Outlook was prepared by staff of the IOSCO Research Department with the benefit of discussion with and input from members of the Committee on Emerging Risks, under the direction of Werner Bijkerk, Head of the Research Department of IOSCO. We would like to thank David Wright, Secretary General of IOSCO and Carlos Tavares, Chairman of the Committee on Emerging Risks. We would also like to thank members of IOSCO's Research Department network for providing expert views through the Risk Outlook Survey and on-going market intelligence sessions.

Any comments on the report should be forwarded to research@iosco.org. Website at www.iosco.org/research

¹ Shane Worner, "A Survey of Securities Markets Risk Trends 2014: Methodology and Detailed Results", *IOSCO Research Department Staff Working Paper*, June 2014

² The IOSCO Board is the governing body of IOSCO and consists of 32 securities markets regulators around the globe.

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EXECUTIVE SUMMARY

> The *IOSCO Securities Markets Risk Outlook 2014-2015* (the Outlook) has been written during a transformative period for global financial markets. As the initial impacts of the 2008 financial crisis recede, securities markets continue to become an increasingly important financing channel for the real economy. In addition, innovation is re-entering the markets, especially in debt and structured finance markets. Such innovation can help foster competition and new options for financing, wealth creation and diversification but also can introduce risks to the markets.

> The analysis in this Outlook has benefited from the growing availability of data on securities markets, although data gaps still persist, and from comprehensive inputs from experts in the markets, the academic world and the regulatory community. Furthermore, the Outlook builds on the work of other global organisations, such as the FSB and the IMF, and consequently the analysis presented is complementary to the risk identification work of these organisations.

> Following publication of the first Outlook last year, IOSCO has undertaken extensive outreach to discuss and communicate the messages of the Outlook series. Understanding and communicating potential systemic risks are an important first step in the mitigation of risks.

Part I: Notable trends and vulnerabilities in securities markets

Importance of securities markets is growing ...

> There is evidence that domestic credit provision by banks is being substituted gradually by market-based financing in developed economies, especially in the US and Europe, where growth in corporate bonds outstanding has grown more quickly than bank credit.

> In China the securities markets are also growing but this growth is dwarfed by the rapid expansion of the local banking sector. The outstanding amount of bank lending to non-financial firms in China has tripled to \$12 trillion in 2013 and has surpassed the size of the US banking system by 50%.

> In terms of activity, equity and corporate bond markets have exhibited strong growth. Initial and special public offerings in equity markets reached \$833 billion globally in 2013, only 10% below pre-crisis levels, while issuance in corporate bond markets reached an all-time high of \$3.6 trillion, with \$2.2 trillion coming from non-financial firms.

> The growth of market-based finance is spreading to include innovative markets such as crowdfunding. Crowdfunding volumes are still very small compared to bank lending and corporate bond markets, but they continue to increase at an exponential rate, with issuances largely domiciled in the US, China and the UK.

> Financial firms use corporate bond markets as their primary source of securities markets funding with an expected \$1.5 trillion of issuances in 2014. The volume of issuance of structured finance products, such as asset-backed securities (ABS), mortgage-backed securities (MBS) and covered bonds, has stabilised during the last couple of years. In 2014, these products will account for in total around \$911 billion globally, less than one third of the pre-crisis peak of \$3.2 trillion.

> The asset management industry now manages around \$30 trillion of assets globally. Notably, assets under management in the hedge fund industry have increased steadily from \$825 billion in 2003 to \$2.2 trillion in the first quarter of 2014.

> In China wealth management products (WMPs) have benefited from the heightened interest from retail investors, who are searching for additional yield

above deposits. The amount of WMPs outstanding has surpassed the equivalent of \$2 trillion. There are concerns around the quality and transparency of WMPs. The size, the rapid growth, the lack of regulation, the interrelation with the banking system, the lack of transparency, and the questioned quality of underlying assets, suggest that WMPs are a potential source of systemic financial risk.

Asset price valuation is increasing...

> In general, equity markets in developed economies have continued to show rising prices over the last year with double digit returns. Volatility levels have returned to low pre-crisis levels. The price valuation of equity markets in the US and Europe is rising, although the level in each market is quite different. In fact, in the US, valuations are close to two standard deviations above the historical average. Valuations in Europe are also upward trending, albeit still below the historical average.

> The low interest rate environment has allowed firms to issue debt at historically low costs. Thus bond issuance, including high yield, has increased globally. The low credit spreads indicate a greater investor appetite for risk and a higher valuation of fixed income assets. For example, investment grade and high yield US corporate bond spreads above Treasuries are at very low levels due to historically low interest rates, combined with low default rates (part of which may be explained by the extended maturities of such bonds).

> Potentially higher interest rates in the near-term will lead to volatility in markets as they adjust prices to the new reality. This will create winners and losers among market participants. Securities market regulators around the globe, who are concerned with the efficient functioning of markets, should try to ensure that investors are well-informed of the investment risks.

Derivatives markets are still growing and clearing is increasing...

> Derivatives markets have gone through significant changes since the onset of the financial crisis. The Gross Notional Exposure (GNE) in over-the-counter (OTC) derivatives markets has increased from approximately \$500 trillion in December 2008 to \$710 trillion in December 2013.

> Central clearing volumes continue to increase as clearing regulations come into effect globally. 61% of Interest Rate Swaps (IRS) and 30% of the Credit Default Swaps (CDS) were centrally cleared at the end of April 2014. These two types of derivatives account

for \$360 trillion of the OTC derivatives market. However, cross-currency swaps, which total \$16 trillion, remain uncleared.

Some real estate markets and real estate investment trusts could be vulnerable...

> Real estate markets that suffered most from the crisis have started to recover and prices have stabilised. The strongest growth since the crisis has been seen in Hong Kong (117%), Singapore (52%), Austria (45%) and Taiwan (40%). Also some emerging markets such as Malaysia, Turkey, China, the Philippines and United Arab Emirates have all experienced average price increases of more than 30%. This may be attributed to catch up demand from the expanding middle class in these countries and to the capital inflows driven by the search for yield. This may have driven prices above fundamental values. The risk is that a potential fall in prices could affect the economy of these countries should interest rates rise in tandem with an outflow of capital.

> Real Estate Investment Trusts (REITs) tend to employ varying ratios of leverage obtained through bank debt or the corporate bond market. Potentially rising interest rates would result in a downward adjustment in property values, which would represent a capital loss for REITs. In addition, REITs which are largely dependent on short/medium term funding agreements and use higher leverage may have difficulty refinancing their debts in a rising interest rate environment because of greater perceived credit risk.

> In a severe downturn, declining rental yields and prices could push the loan-to-value ratios to levels where private sector refinancing is no longer viable. As a result of the REITs' leveraged structure and exposure to highly illiquid and cyclical real estate assets, some financial regulators worldwide have focused their attention on potential systemic risks posed by these investment trusts (e.g. fire sales of real estate asset depressing real estate prices), which could increase the vulnerability of the financial system. Such risks could be accentuated in certain structured REITs, like mortgage REITs (mREITs), compared to more traditional REITs that hold real estate as a long-term investment.

Capital flows in emerging markets have grown and are affecting securities prices...

> Capital flows into emerging markets (EMs) have increased substantially since the financial crisis. Increased flows combined with less developed financial

markets have resulted in high relative valuations in some EMs. In China, the sustainability of credit growth is particularly noteworthy.

> While bank lending and foreign direct investment remain strong components of financial flows to EMs, a noteworthy shift in the profile of cross-border flows is the growing preponderance of cross-border non-bank credit provision to EMs since the crisis. Furthermore, cross-border securities markets' financing is also picking up.

Global macro-economic policy is impacting securities markets...

> Accommodative monetary policy in most developed economies is being pared back. In the euro area, the size of the Eurosystem's balance sheet has declined gradually since peaking in mid-2012, as funding market conditions have improved. In the US, the Federal Open Market Committee (FOMC) of the Board of Governors of the Federal Reserve System is gradually reducing the pace of asset purchases such as agency mortgage-back securities (MBS) and long term Treasury securities. Changes of US and European monetary policies will have spill-over effects on global securities markets.

> Recent macroeconomic data suggest that the incentives to follow different monetary policies in different countries until now aligned are growing. In the US inflation is expected to resume to levels nearing 2%, and the UK seems to be positively diverging from the remainder of the European Union. The risk of deflation is quite present, particularly in the Eurozone, where several countries already have registered below zero year-on-year CPI rates for months. If these changes in the rate of inflation materialise simultaneously, central banks may have stronger incentives to pursue domestic monetary policy goals and diverge from the more coordinated monetary policy of the last several years. This could cause significant adjustments in exchange rates and have a potential impact on financial markets.

Part II: Potential Sources of Systemic Risk

The search for yield and the return of leverage in the financial system

> The current low interest rate environment is increasing investor risk taking in a search for yield.

Concurrently, lower credit risk has reduced investors' fear of default. These factors have resulted in a growing stream of riskier products onto the market. In 2014, high yield bond issuances are expected to reach a historical high of \$617 billion. Subordinated bond issuance is projected to reach \$297 billion in 2014, close to pre-crisis levels, while covenant-lite bond issuance to reach a projected \$177 billion. Issuance is also up for payment-in-kind debt and contingent capital.

> In addition, leverage in the system is increasing in various ways. The provision of leveraged loans has returned to pre-crisis highs, reaching a projected \$1.8 trillion loans originated in 2014. Margin debt in the US, an indication of speculation in the stock market, reached the all-time high of \$1.4 trillion in the first quarter of this year. Leveraged financing through high yield bond markets has also returned to pre-crisis levels, reaching a projected \$119 billion this year.

> Both public and private debt has increased substantially since the inception of the crisis.

> The issuance of securitised products has not recovered since the onset of the crisis, despite some marginal growth in recent years. In 2014, the issuance of securitised products is expected to reach \$691 billion.

> More granular data gathering, scenario analysis and stress testing are important for further assessing the high leverage and complexity in financial markets. Such exercises would be especially important in the context of the unwinding of accommodative monetary policy anticipated in the near-term and slowing growth in some major emerging markets.

Search for yield and capital flows to emerging markets

> The securities markets of EMs are beginning to develop in size, although they remain relatively illiquid compared to those in advanced economies. This means that the volatility of capital flows to these economies [still] remain a point of risk entry – for example if triggered by the unwinding of accommodative monetary policy in the developed world.

> EM bond yields, stock market performance and currencies were impacted, some more than others, by the US Fed suggestion of tapering in mid-2013. However, most economies have since recovered – with other factors such as political risks and the Chinese growth slowdown having a possibly more pronounced effect on flows.

> Once US interest rates begin to rise, the full effects of a changing interest rate environment will be more evident. In this context, the amount of activity and sophistication of financial markets, macro factors such as the status of credit build-up, external debt and current account balances, as well as regulation and policy controls used, could limit or aggravate the impacts of a reversal of capital flows. Other factors such as political risk and securities markets development and regulation are important to consider going forward, when assessing risks in this space.

The risks of central clearing

> OTC derivatives markets have undergone significant reform since the financial crisis. A major element of this reform involves the mandatory clearing of derivative contracts through central counterparties (CCPs). Accordingly, international bodies including IOSCO, the Basel Committee on Banking Supervision (BCBS). The Committee on Payment and Settlement Systems (CPSS) and the FSB have set up working groups and taskforces all with the purpose of providing policies for central clearing.

> Central clearing is good because of increased transparency and mutualised counterpart risk to contain any further material systemic consequences. This is why it is a keystone of the OTC derivatives reforms. There are, however, risks to which authorities need to continue to be vigilant towards.

> CCPs have developed business models and risk management procedures that seem robust. However, in light of the reforms, several areas have been highlighted: the inherent pro-cyclicality of margin calls and the widespread use of similar risk management models, the varying levels of capitalisation of CCPs to withstand the failure of clearing members, risk related to the investment policies of CCPs, the acceptance of collateral of varying quality, and the structure of default waterfalls.

The increased use of collateral and risk transfer

> Banks are facing more stringent capital requirements that mandate their holding of high-quality collateral. Additionally, central banks are holding collateral in return for providing necessary bank funding liquidity. More generally, banks and OTC derivatives dealers must locate high-quality collateral to meet initial and variation margin requirements for their OTC trades, requirements that are expected to increase over the next few years. It may be difficult to determine

where the collateral in the system is located and where it is transferred, given current disclosure regimes.

> While the posting of collateral for OTC derivatives transactions diminishes risks for the counterparty, increasing collateral requirements in other areas of the financial markets are increasing the proportion of encumbered assets on banks' balance sheets. This may have adverse implications for the financial system. The use of collateral adds to complexity, interconnectedness and opacity.

> Market participants, including banks, may use alternative and sometimes innovative practices for providing highquality collateral. These practices include collateral transformation and optimisation services as well as repo and re-hypothecation. Re-hypothecation and collateral transformation practices are mostly on-balance sheet when cash is received for a security, but are sometimes off-balance sheet when there is not an exchange of cash. This lack of disclosure makes it hard to assess these activities and can contribute to the risk of the financial system.

Governance and culture of financial firms

> Corporate governance failures have been cited for contributing to the financial crisis and the more recent Libor scandals.

> Corporate governance failures can include scenarios in which firm/operational risks are not managed on an enterprise basis and not adjusted to corporate strategy; for example, where risk managers are separated from the general management of a firm and not regarded as an essential part of implementing the company's strategy.

> Anecdotal evidence suggests that monitoring by shareholders to mitigate corporate governance concerns occurs in both diversely held companies and firms with more concentrated ownership. In some instances shareholders have been equally concerned with short termism as have managers and traders, neglecting the effect of excessive risk taking practices.

> The governance of remuneration/incentive systems has often failed because negotiations and decisions are not carried out at arm's length. Managers and others have had too much influence over the level and conditions for performance based remuneration with boards unable or incapable of exercising objective, independent judgment.



INTRODUCTION

The *IOSCO Securities Markets Risk Outlook 2014-2015* (the Outlook) is the second edition of the annual IOSCO's Securities Markets Risk Outlook series. The series was mandated to support IOSCO's Principles 6 (identifying, monitoring and mitigating systemic risk) and 7 (reviewing the perimeter of regulation) and aims to:

- > provide a general global overview of major trends in the financial system; and
- > identify and analyse potential systemic risks in securities markets.

In terms of risk identification, the Outlook does not seek to measure the level or likelihood of these risks, but provides a basis for national regulators to perform such assessments in their own jurisdictions or at a regional level.

The analysis in this Outlook builds upon last year's volume (published October 2013)³ and has benefited from the increasing availability of securities markets data and comprehensive inputs from experts in the markets, the academic world and the regulatory community. Following the publication of the first Outlook last year, IOSCO has undertaken extensive outreach to discuss and communicate the messages of the Outlook series. Understanding and communication of potential systemic risks is an important first step in the mitigation of risks.

This year's Outlook is divided into two parts. **Part I** describes selected global trends and potential vulnerabilities in securities markets, while **Part II** identifies the following potential systemic risks in or related to securities markets:

- > the search for yield and the return of leverage in the financial system (Chapter 1);
- > search for yield and capital flows to emerging markets (Chapter 2);
- > risks of central counterparties (Chapter 3);
- > the increased use of collateral and risk transfer (Chapter 4); and
- > governance and culture of [listed] financial firms (Chapter 5).

The *IOSCO Securities Markets Risk Outlook* is the only periodic publication that identifies and analyses potential systemic risks from a global securities markets perspective. The analysis of risks of the Outlook is complementary to the analyses offered by other organisations. For example, the International Monetary Fund (IMF) and the Bank of International Settlements (BIS) publish periodically analyses of potential global risks that can affect financial stability from a macro-financial and banking related perspective. The European Securities and Markets Authority (ESMA) and the Financial Stability Oversight Council (FSOC) in the US have also published periodic reports on trends and vulnerabilities in the financial system from a regional perspective. Table 1 illustrates trends and risks identified by the IMF, BIS, ESMA and FSOC.

3 IOSCO, *Securities Markets Risk Outlook 2013-2014*, October 2013.

TABLE 1: RISKS & TRENDS IDENTIFIED BY SELECTED OTHER ORGANISATIONS AND IOSCO

Risks related to:	IOSCO Risk Outlook 2014-15	IMF+	BIS++	ESMA+++	FSOC++++
Corporate and Sovereign Debt Issues ¹	Yes	Yes	Yes	Yes	Yes
Shadow Banking	Yes	Yes	Yes	Yes	Yes
Collateral, Tri-Party Repo	Yes		Yes	Yes	Yes
Asset Price Levels ²	Yes	Yes	Yes	Yes	Yes
Investors' Behaviour			Yes		
Rating Agencies				Yes	Yes
High Frequency Trading				Yes	
Short Selling Ban				Yes	
Risk Management	Yes			Yes	Yes
Derivatives Market	Yes			Yes	Yes
Innovative Financial Products	Yes			Yes	Yes
LIBOR					Yes
Cyber Security & Technological and Infrastructural Vulnerabilities	Yes				Yes
Search For Yield and Leverage	Yes	Yes	Yes	Yes	
Emerging Markets Volatility	Yes	Yes		Yes	Yes
Macro-financial trends	Yes	Yes	Yes	Yes	Yes
Banking Risks		Yes	Yes		
Data Gaps and Data Quality	Yes				Yes
Insurance Sector			Yes		Yes
Geopolitical Risks	Yes	Yes			Yes

Source: IOSCO Research Department based on IMF, BIS, ESMA and FSOC.

Notes: 1) The risks mentioned in the table are the interpretation of the IOSCO Research Department, are not meant to be a complete overview of the risks highlighted by the respective institutions. Risks mentioned in the table are not necessarily covered amply in the respective reports; 2) Corporate and Sovereign Debt issues includes risks related to corporate and sovereign bond market, debt levels and spreads, Risks around Asset Price levels includes equity, fixed income and FOREX markets; housing and real estate and asset risk management; 3) +IMF Global Financial Stability Report (Oct 13 & Apr 14); ++BIS 84th Annual Report (Jun 14); +++ESMA Report on Trends, Risks and Vulnerabilities (No. 1, 2014 & No. 2, 2013); ++++FSOC Annual Report (2014).

Macro-economic context

This Outlook has been written during a transformative period for global financial markets. As the initial impacts of the financial crisis recede, securities markets are emerging as an increasingly important financing conduit for the real economy. In addition, innovation is reentering the markets, especially in debt and structured finance markets. Such innovation can increase options for financing,

wealth creation and diversification but also can introduce risks to the markets.

During the past twelve months, some European countries have returned to positive economic growth. The Americas, Japan, China and other Asian-Pacific countries, alongside most African-Middle East countries, also display a positive growth trend. Nevertheless, the announcement of tapering of the monthly purchases of securities by the US

Federal Reserve (Fed) created a temporary ripple effect through recovering and emerging economies.

The announcement resulted in a sudden interest rate hike for 10-year US Treasuries from 2% to 3% in late 2013, before a drop to 2.5% in the first half of 2014. In the second half of 2013, there was a global sell-off of bonds and, to a lesser extent, equities. Stock market prices fell and in some emerging markets the exchange rates depreciated and interest rates rose. The impact of a changing interest rate environment was initially analysed in last year's Outlook.⁴ This year's Outlook provides further analysis of associated risks.

The increasing importance of securities markets in financing the real economy is also highlighted in this Outlook. Last year's Outlook analysed some examples of this shift, which this Outlook will elaborate on from a global perspective. As securities markets grow, innovation is also re-entering the markets. This Outlook presents a number of examples and discusses associated risks.

Regulatory Context

As economies recover from the crisis, regulators around the world have been focusing on mitigating the causes of the last crisis and the probability that another could occur. Regulators are also increasingly focused on fostering economic growth.

Regulators have been working on the establishment of sound regulation globally, regionally and locally. IOSCO has introduced numerous global standards and policies on a number of issues, including risks mentioned in last year's Outlook,⁵ alongside the other standard setters the Basel Committee for Banking Supervision (BCBS), the Committee for Payment and Settlement Systems (CPSS) and the International Association of Insurance Supervisors (IAIS).

IOSCO has contributed to the work of the Financial Stability Board (FSB), as well as contributing directly for G20 Leaders. Implementation of these global standards is also a focus. The intensification

of supervision has also gained momentum, with the European Central Bank assuming responsibility for the supervision of the larger banks of the euro-area Member States as just one example.

Approach of the Risk Outlook

Building on the extensive work conducted by IOSCO's Policy Committees, the Outlook seeks to identify other notable trends and possible vulnerabilities from a systemic risk perspective. The analysis of the Outlook is based on the methodologies developed by the IOSCO Research Function (see Box 1) which comprises of the IOSCO Research Department⁶ and the Committee on Emerging Risks.⁷ It employs both a top-down and bottom-up approach for analysing developments in securities markets globally:

1. **Top-down:** Identification of macro-economic and securities markets trends and potential vulnerabilities based on data collection and analysis; development of quantitative systemic risk indicators; and a risk survey of experts from the market, academic world and regulatory community (see Table 1).
2. **Bottom-up:** The selection of risk topics reached through consensus of the CER and IOSCO Research Department and based on data analysis and a thorough consultation with a globally diversified group of experts including regulators, market participants and academia.

The IOSCO Research Department survey of Securities Markets Risk Trends 2014⁸ is the third annual version and received over 200 replies from experts globally. Table 1 below shows the five most frequently mentioned risks. Of note in the most recent survey report is the change in perception of

⁶ See Werner Bijkerk, Rohini Tendulkar, Samad Uddin and Shane Worner, "Systemic Risk Identification in Securities Markets", *IOSCO Research Department Staff Working Paper*, July 2012 for details.

⁷ IOSCO, *Mitigating Systemic Risk: A Role for Securities Regulators*, 2011 and IOSCO, *Risk Identification and Assessment Methodologies for Securities Regulators*, June 2014

⁸ Shane Worner, "A Survey of Securities Markets Risk Trends 2014: Methodology and Detailed Results", *IOSCO Research Department Staff Working Paper*, June 2014

⁴ See IOSCO, *Securities Markets Risk Outlook 2013-2014*, chapter 4.4

⁵ Such as the new risks involved in the developments in derivatives markets and collateral management.

Box 1: IOSCO Research Function

The Research Function of IOSCO, comprised of the Research Department at the General Secretariat and a Committee on Emerging Risks (CER) of IOSCO members, has undertaken work on identifying, analysing and monitoring systemic risk. During the last year the CER published a report on methodologies being used for identification, assessment and mitigation of systemic risks¹ demonstrating the growing knowledge and experience of securities markets regulators in this field.

This report builds upon the report of the Research Department on systemic risk identification² and a discussion paper on systemic risk³ prepared by a working group of IOSCO. The CER, jointly with the Research Department, produces a risk dashboard which is used to periodically update the IOSCO Board on risks and trends.

The Research Department produces staff working papers which explore in-depth important risks to the financial system and opportunities to enhance financial stability. During the past year, four staff working papers were published on:

- > The potential systemic risks of **cyber-crime** in securities markets for which unique information was obtained from a survey of securities exchanges in collaboration with the World Federation of Exchanges;⁴
- > The risks and benefits of **crowd-funding**;⁵
- > A global perspective on **corporate bond markets**, including potential systemic risks and the role in market-based and long-term financing;⁶ and
- > A **survey on risks** in the securities markets.⁷

The staff working papers have been used to inform the IOSCO Board and Committees in its policy discussions. The report on crowdfunding was also discussed in the FSB's Innovation Network, while the report on cybercrime is being used as an input into the work of a number of regulatory and non-regulatory organisations at the global, regional and local level.

In addition to the risk assessment exercises, the IOSCO Research Function is seeking to establish a more structured basis for IOSCO research that can better support IOSCO policy and capacity building. For example, over the last year various data gathering exercises have been launched. The first segment that is being researched in detail is the corporate bond markets and, following the publication of the first volume,⁸ two more volumes are expected to be published over the next two years.

Specific activities include the:

- > IOSCO Research Department Statistics portal.⁹ The IOSCO Research Department has launched a statistics portal with global and regional trends in various market segments.
- > IOSCO Africa-Middle East Regional Committee. The IOSCO Research Department is working together with the members of the Africa-Middle East Regional Committee to fill data gaps in this region. The results will be used to expand the statistics website and to broaden the coverage of the various analyses.
- > IOSCO Affiliate Members Consultative Committee¹⁰ (AMCC). The IOSCO Research Department is working together with the members of the AMCC on the gathering and processing of data on investment funds. The results will be used to expand the statistics website and to broaden the coverage of the various analyses.

Further staff working papers are planned on corporate bond market in emerging economies, corporate bond market in developed markets, leverage and complexity, central clearing, the use of collateral, corporate governance, behavioural aspects of supervision, and collective investment schemes.

The CER has launched an exercise at a global level to start the gathering and exchange of data, including supervisory data. This project should result in filling current data gaps which should improve systemic risk analyses at a global level.

The AMCC has recently established a Task Force on Emerging Risks to assist the Research Function in being more forward-looking on emerging and known risks in today's securities markets (see Box 7).

1 IOSCO, *Risk Identification and Assessment Methodologies for Securities Regulators*, June 2014

2 Werner Bijkerk, Rohini Tendulkar, Samad Uddin and Shane Worner, "Systemic Risk Identification in Securities Markets", *IOSCO Research Department Staff Working Paper*, July 2012

3 IOSCO, *Mitigating Systemic Risk – A Role for Securities Regulators*, February 2011

4 Rohini Tendulkar, "Cyber-Crime, Securities Markets and Systemic Risk", *IOSCO Research Department Staff Working Paper*, July 2013

5 Eleanor Kirby and Shane Worner, "Crowd-funding: An Infant Industry Growing Fast", *IOSCO Research Department Staff Working Paper*, February 2014

6 Rohini Tendulkar and Gigi Hancock, "Corporate Bond Markets (Vol 1) - A global perspective", *IOSCO Research Department Staff Working Paper*, April 2014

7 Shane Worner, "A Survey of Securities Markets Risk Trends 2014: Methodology and Detailed Results", *IOSCO Research Department Staff Working Paper*, June 2014

8 Tendulkar & Hancock, *Op.cit.*

9 <http://www.iosco.org/research/?subSection=statistics>

10 The AMCC consists of self-regulatory organisations (SROs); securities exchanges; financial market infrastructures (including clearing and settlement agencies); international bodies other than governmental organisations with an appropriate interest in securities regulation; investor protection funds and compensation funds; and any other body with an appropriate interest in securities regulation that the IOSCO Board may decide for the purpose of furthering the objectives of the Organisation.

risks from year to year (over the last three years). While some risks have remained in the top five (e.g. CCPs, capital flows to emerging markets and regulatory uncertainty), others have dropped off the list (including the euro-debt crisis).

TABLE 2: TOP FIVE COMBINED RISK CATEGORIES FROM THE 2014 SURVEY

RISK TOPIC IDENTIFIED
Shadow banking (collateral and repo)
CCPs (including OTC reform and resolution and resolvability)
Regulatory uncertainty
Search for yield and associated risks
Capital flows (especially volatility of flows to emerging markets)

Source: IOSCO Research Department

How to use the Outlook?

The Outlook aims to fill a gap by informing IOSCO members, other organisations with interests similar to those of IOSCO, market participants and the public about trends and potential vulnerabilities in the securities markets, the work of IOSCO in this space and potential systemic risks. This report recognises data limitations and makes recommendations for further research and data gathering/monitoring around systemic risks.

Individual securities regulators can use this report as an information source for the type of research work needed to assist in the implementation of new IOSCO Principles 6 (*The Regulator should have or contribute to a process to monitor, mitigate and manage systemic risk, appropriate to its mandate*) and 7 (*The Regulator should have or contribute to a process to review the perimeter of regulation regularly*).⁹

IOSCO will continue to monitor the areas selected for analysis in this report to see how the potential emerging risks evolve in the future.

⁹ IOSCO, *Methodology for Assessing Implementation of the IOSCO Objectives and Principles of Securities Regulation*, 2011. <http://www.iosco.org/library/pubdocs/pdf/IOSCOPD359.pdf>.

PART
1

TRENDS, DEVELOPMENTS AND POTENTIAL VULNERABILITIES

1.1 Bank lending to the economy is growing...

Despite a sharp decline in 2008, bank lending has steadily increased over the last decade. Figure 1 disaggregates the global financial stock in developed and emerging markets to present the financial profile of these groups. In emerging markets in particular, the provision of bank credit accelerated after the onset of the financial crisis.

In 2004 the ratio of bank lending to market-based financing globally (corporate bond and equity) was 50/50. By 2012, this ratio had swung slightly in favour of bank lending (53% vs 47%).¹⁰ When it comes to the financing the real economy (bank lending figures minus the lending to other financial institutions), there is, however, evidence of substitution away from domestic credit provision and towards market-based financing in some developed markets.

Figure 2 shows loan provision (amount outstanding) to non-financials in the United States, Europe and China.¹¹ In the United States and Europe loan provision to the real economy has declined since the outbreak of the crisis in 2007.¹² Some newer mechanisms for market-based financing are in development (see for example the section on crowd-funding below). There are signals that the segment of relatively smaller sized loans in the SME markets

is particularly vulnerable to a general decline in available bank funding.

In contrast, loan provision to non-financials in China has actually surged over the last years. Between 2007 and 2013, bank lending to non-financials more than doubled in China, accumulating around \$8.5 trillion in the period and rivalling European levels in 2013. In 2013, bank credit outstanding reached approximately \$12 trillion. The rapid expansion 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).

1.2. Corporate reliance on securities markets is increasing...

Equity and debt markets have traditionally been an important source of funding for the nonfinancial corporate sector. This importance has grown in sectors and regions where bank lending to the non-financial sector has been restrained in recent years. This section describes the main trends, including the emergence of some relatively new forms of funding, such as crowd-funding.

Equity markets: returning importance...

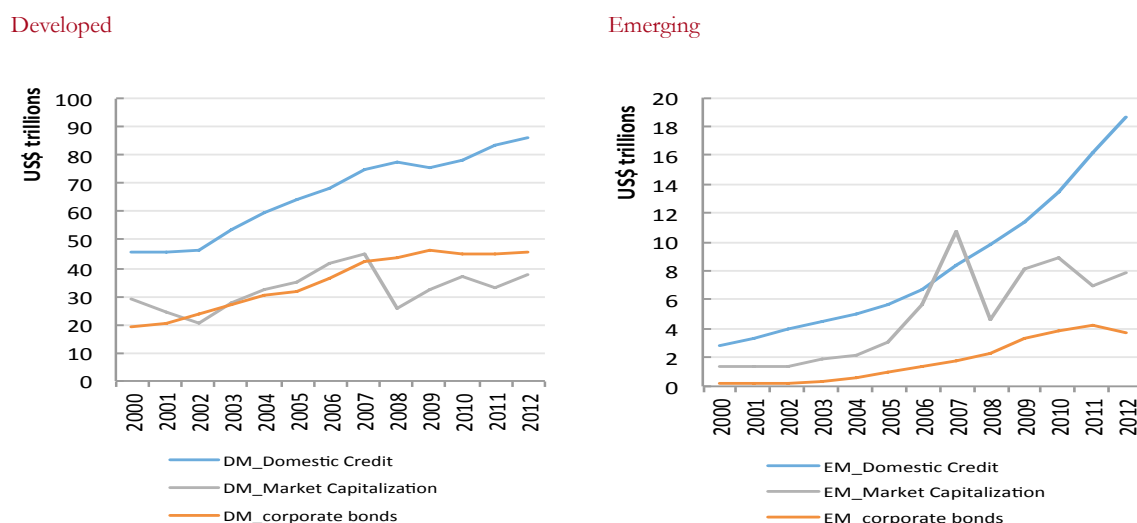
Equity markets globally have shown strong growth in initial and special public offerings of equity (ISPOs) since 2011. Figure 3 shows that the total amount raised globally increased sharply in 2013 to \$833 billion, an increase of 26% compared to 2012. The ISPOs launched in 2014 through April totals \$580 billion. With other big IPOs still planned for

10 See Rohini Tendulkar and Gigi Hancock, "Corporate Bonds Markets: A global perspective", *IOSCO Research Department Staff Working Paper*, April 2014

11 Countries selected due to data availability

12 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.

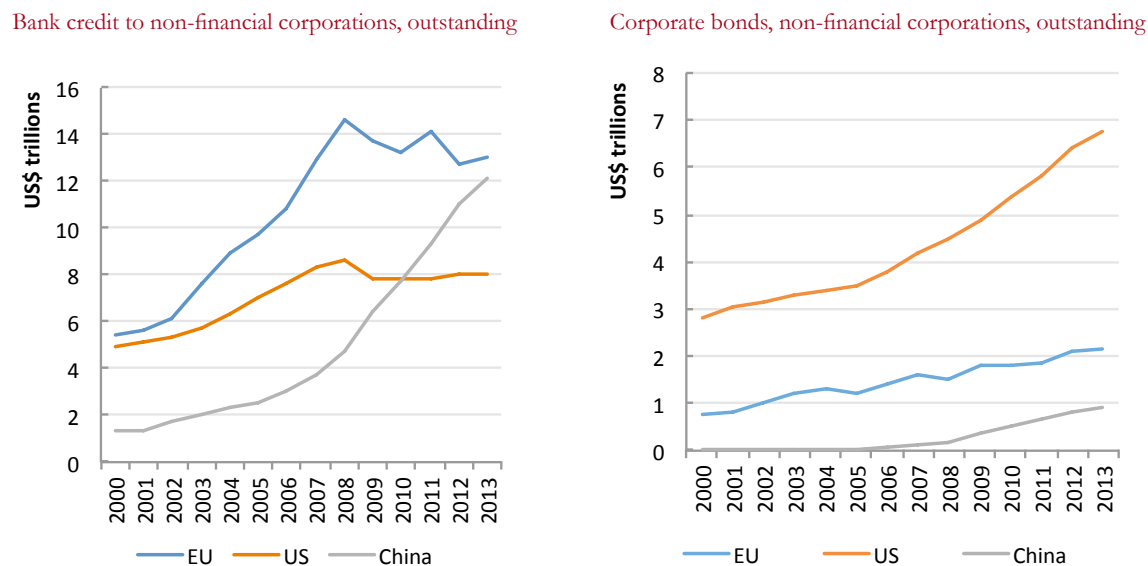
FIGURE 1: WORLD, DEVELOPED MARKET AND EMERGING MARKET FINANCING PROFILES



Source: Equity data based on market capitalisation 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 Asian Bonds Online (financial and non-financial combined).

Notes: 1) 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; 2) DM (Developed Markets in sample and EM (Emerging markets in sample).

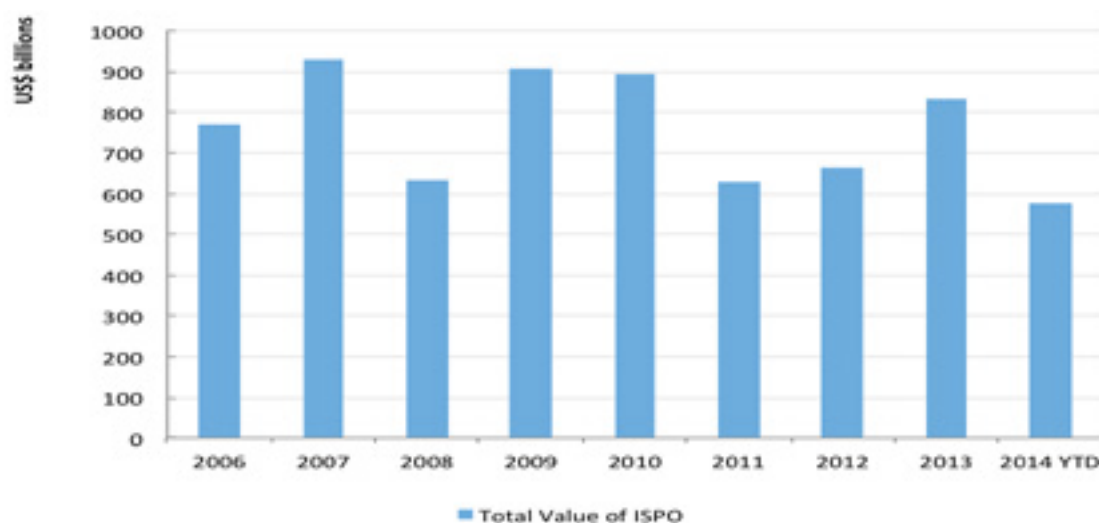
FIGURE 2: EVOLUTION OF BANK LENDING/CORPORATE DEBT FOR NON-FINANCIALS – SELECTED ECONOMIES



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

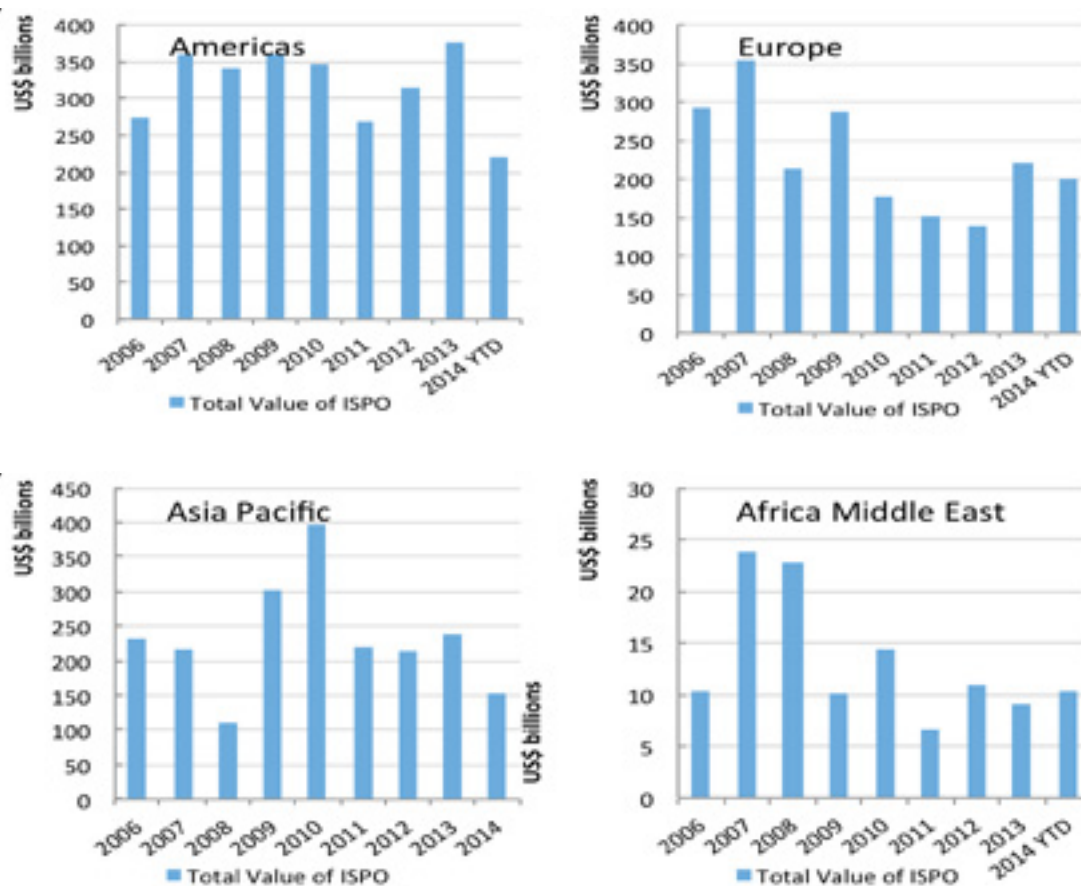
Note: End data at June 2013.

FIGURE 3: GLOBAL INITIAL AND SECONDARY PUBLIC EQUITY OFFERING



Source: Dealogic

FIGURE 4: REGIONAL BREAK-DOWN OF ISPO EQUITY OFFERING



Source: Dealogic

the year, 2014 is expected to be roughly equal to 2013 issuances. Despite recent growth, the current level is slightly below 2007 and the recapitalising period of 2009 and 2010.

Figure 4 shows that the growth in ISPOs in 2013 stemmed predominantly from the Americas and Europe. In the Americas \$376 billion of equity was sold to investors, slightly above the pre-crisis levels. Europe showed a strong recovery from \$137 billion to \$220 billion but is still well below the \$353 billion peak in 2007. The Asia-Pacific region showed a slight increase to \$238 billion in 2013 as well, but is still below the peak of \$398 billion 2010. The Africa-Middle East region showed an issuance of just above \$9 billion, almost \$2 billion less than 2012 and much below the pre-crisis peak of \$24 billion in 2007.

Debt markets: corporate bond issuance at all-time high...¹³

In an era of low interest rates and declining access to bank funding in some markets, corporations have increasingly turned to the securities markets to issue debt. Figure 5 suggests that in 2014, corporate bond issuance volume is expected to reach \$3.6 trillion, more than double 2005 levels and 3.5 times higher than in 2000. The use of corporate bond markets for funding by the financial industry and non-financial corporates has varied over the years. In 2000 both sectors had an equal share of total issuance. From 2004 to 2008 the share of financial companies rose to around 60% of total issuance. After the crisis, the share of financials dropped dramatically and in 2013 only 35% of issuance derived from financial companies, totalling about \$1 trillion per year in 2012 and 2013. In 2014, issuance from both non-financial and financial corporations is expected to increase, reaching \$1.5 trillion in the latter case and \$2.5 trillion in the former.

At the regional level, the Americas (Figure 6), the Asia Pacific region (Figure 7) and Europe/Middle East/Africa (EMEA) (Figure 8) show increasing issuance for non-financial and financial firms in 2014. The total issuance of corporate bonds is

expected to be around \$1.3 trillion in both the US and in Europe in 2014, while Asia-Pacific is expected to issue around \$1.0 trillion.

Since the crisis, bond issuances in the US and in the Asia-Pacific region predominantly stem from non-financial companies. In Europe issuance has been split almost equally over the past few years.

Figure 9 shows that Islamic bond issuances (*sukuk*) have dropped slightly in 2013 compared to the preceding year. Despite this small decline, the \$38.4 billion issued in 2013 was significantly higher than the 2008-2010 period. *Sukuk* issuances in 2014 are expected to be at record levels.

Crowd-funding: an innovative funding vehicle growing fast...¹⁴

The growth of market-based finance in the wake of the crisis is illustrated by the rise of innovative vehicles such as crowd-funding. Crowd-funding is an umbrella term describing the use of small amounts of money, obtained from a large number of individuals or organisations through a web-based platform, to finance a project or business. The crowd-funding market, driven by peer-to-peer lending, has doubled year-on-year for the last five years and is estimated to reach \$9 billion of outstanding loans by the end of 2014.¹⁵

Peer-to-peer lending has spread, making crowd-funding a global trend. The equity crowd-funding market is more modest in size and has grown at a slower pace. Figure 10 shows crowd-funding exists in a number of countries around the globe. The phenomenon is still, however, concentrated in three countries: 57% of the outstanding peer-to-peer lending securities are in the US, 20% are generated in China and 18% in the UK. Total loan origination was \$3.3 billion last year and is expected to exceed \$5 billion globally in 2014.

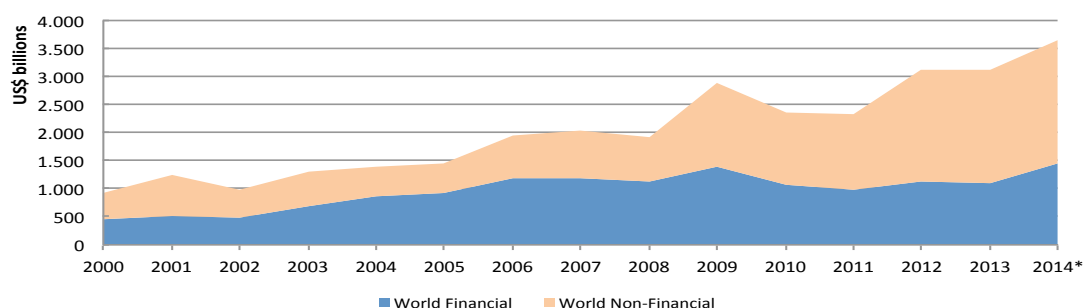
Growth rates globally are high and will most probably remain so into the future. Crowd-funding markets are growing not only in terms of depth but

13 The development of corporate bond markets globally has been analysed by the IOSCO Research Department, see: Rohini Tendulkar and Gigi Hancock, "Corporate Bond Markets: a global perspective", *IOSCO Research Department Staff Working Paper*, April 2014

14 For a global overview of the benefits and risks of crowdfunding, see Eleanor Kirby and Shane Worner, "Crowd-funding: An Infant Industry Growing Fast", *IOSCO Research Department Staff Working Paper*, February 2014

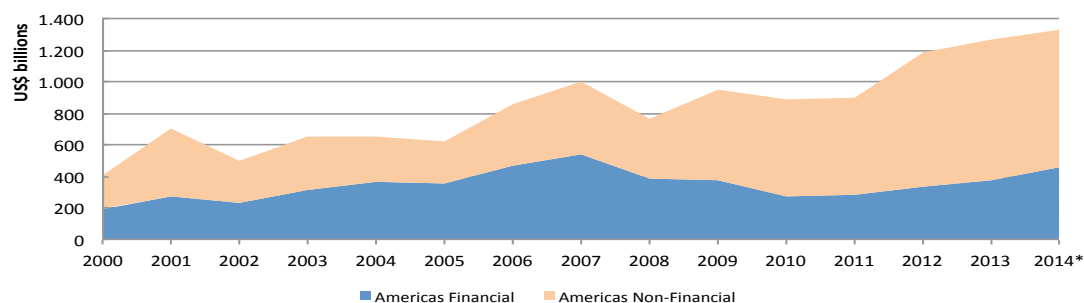
15 Kirby and Worner, *Op cit*.

FIGURE 5: CORPORATE BOND ISSUANCE GLOBALLY – FINANCIAL AND NON-FINANCIAL



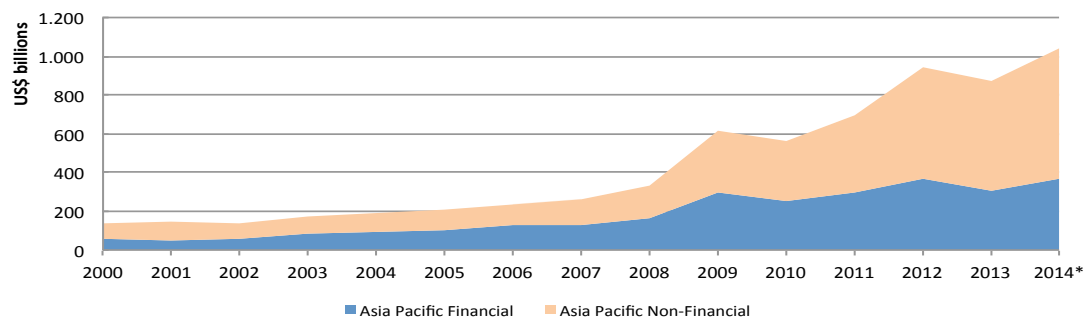
Source: Dealogic

FIGURE 6: CORPORATE BOND ISSUANCE PER REGION - FINANCIAL AND NON-FINANCIAL AMERICAS



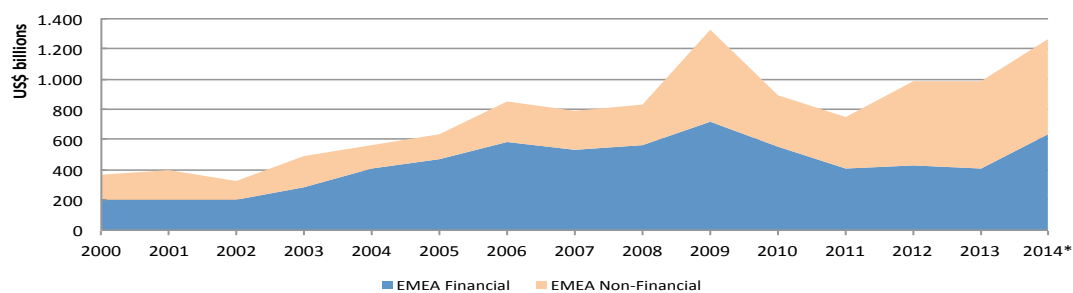
Source: Dealogic

FIGURE 7: CORPORATE BOND ISSUANCE PER REGION - FINANCIAL AND NON-FINANCIAL ASIA-PACIFIC



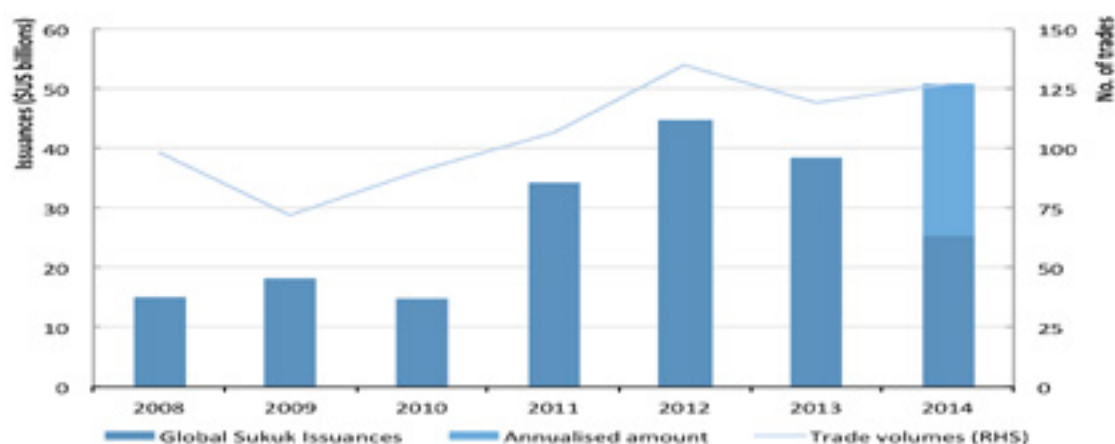
Source: Dealogic

FIGURE 8: CORPORATE BOND ISSUANCE PER REGION - FINANCIAL AND NON-FINANCIAL EUROPE-MIDDLE EAST, AFRICA (EMEA)



Source: Dealogic

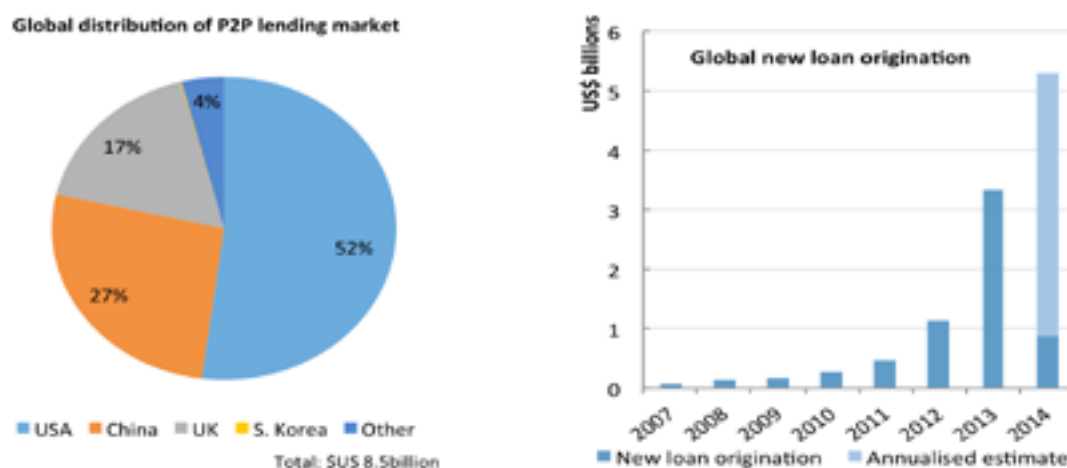
FIGURE 9: GLOBAL ISSUANCES OF ISLAMIC BONDS (SUKUK)



Source: Dealogic

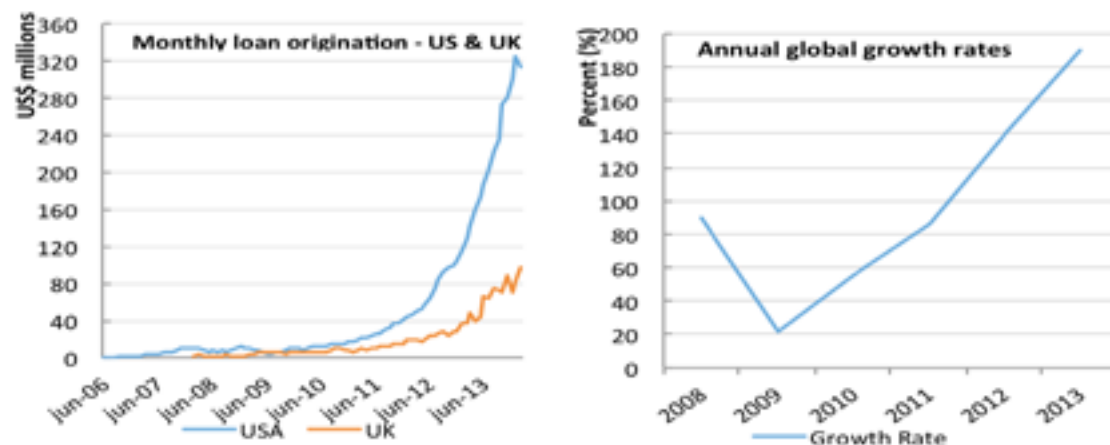
Note: Annualised 2014 is IOSCO Research Department projection

FIGURE 10: GLOBAL LEVEL TRENDS IN FINANCIAL RETURN CROWD-FUNDING



Source: IOSCO Research Department based on various crowdfunding platforms (see IOSCO research Department Staff Working Paper 'Crowdfunding: An Infant Industry Growing Fast', for more details. Data as of Feb-2014)

FIGURE 11: MONTHLY LOAN ORIENTATION



Source: IOSCO Research Department based on various crowdfunding platforms, Data as of Feb-2014

also breath: existing platforms are deepening by attracting more borrowers and investors, while at the same time the market is widening as new platforms enter (see Figure 11).

Crowd-funding can provide a boost to economic growth by providing credit to SMEs and other borrowers in the real economy. In this way, it can fill a credit gap left by banks and due to a lower cost base, it can offer a lower cost of capital to firms and higher returns to investors. Furthermore, it can potentially offer investors a new product for portfolio diversification.

Crowd-funding is an industry in its infancy, and very small compared to the trillions of dollars in bank lending, corporate bond financing and ISPOs. However, crowd-funding is seen as of growing significance and could prove important for small (and medium) enterprises, which are reported to have the most difficulties accessing bank funding after the crisis. However, as crowdfunding is a recent innovation, regulation differs across countries, while investors face several identifiable risks.¹⁶

Other debt products

The role of debt markets in funding non-financial firms is of increasing importance. These markets are developing fast and play a role in global economic development. This trend also includes the resurgence of instruments that incorporate more risks in their structure, such as Payment-in-Kind bonds and covenant-lite loans. *Part II, Chapter 1* of this report will analyse the risks of these products in more detail.

1.3. Increasing use of securities markets for funding of financial firms

Securities markets have traditionally been an important source of funding for financial firms. Financial firms use both traditional channels, such as equity and bonds, and specialised channels such as securitisation and covered bonds.

Equity markets are not the primary funding method for financial firms...

Initial and follow-on offerings of public equity (ISPOs) of financial companies have remained around the pre-crisis levels of 2006 (Figure 12). Since 2011 the amount raised annually has been consistently above \$100 billion, down considerably from the peak level in 2008 of almost \$300 billion. Compared to the amounts that financial firms raised through the bond markets (see below), the equity market is not the primary financing method for financial firms.

Corporate bond markets are an important source of funding for financial institutions...

Figure 5 in the previous section, shows that bond issuance by financials have been around \$1 trillion on average each year since 2006. This compares to the average \$100 billion raised annually in equity issuance since 2011. Corporate bond issuance by financial firms spiked in 2009 at \$1.4 trillion when additional refunding programs were rolled out for banks. Issuance is projected to reach a new high of around \$1.5 trillion in 2014.

In addition, banks are funding themselves using innovative forms of bonds, such as Contingent Convertible bonds (CoCo's) and "write-down" bonds, which enable them to reduce debt and increase capitalisation in periods of distress, while complying with Basel III.¹⁷ In 2013, contingent capital issuance reached \$15.2 billion.¹⁸ The majority of this issuance was in the form of write-down bonds (\$10 billion). CoCo issuances in 2013 reached \$5 billion, while issuance levels before 2013 were negligible.

Securitization and covered bond markets are an important source of funding but are far below pre-crisis levels...

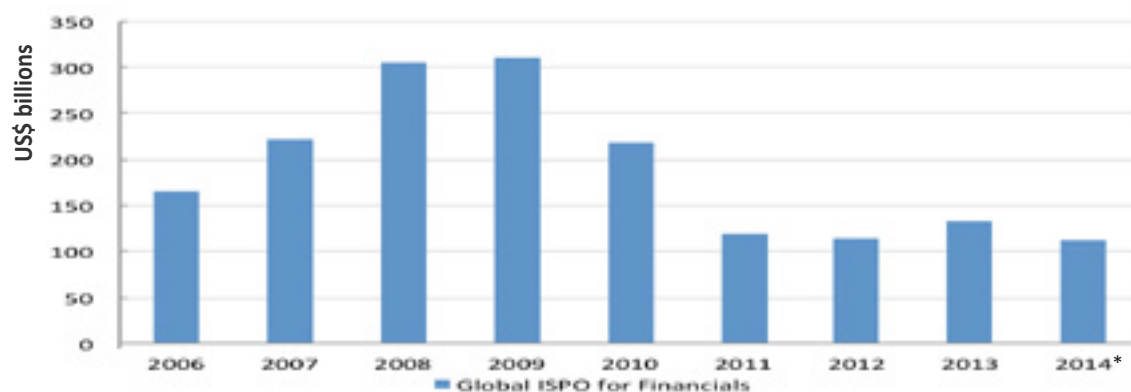
Securitisation issuance peaked at \$2.8 trillion globally in 2006 (see Figure 13). Since the onset of the crisis, and after a steep fall in 2008 to just \$475 billion, the securitisation market has not recovered to pre-crisis levels, with issuance levels projected to reach

16 Risks are identified in Shane Worner and Eleanor Kirby, "Crowd-funding: An infant industry growing fast", *IOSCO Research Department Staff Working Paper*, February 2014

17 For a more detailed explanation see R. Tendulkar and G. Hancock, *Op. Cit.*, 2014 and Stefan Avdjiev, Anastasia Kartasheva, Bilyana Bogdanova, "CoCos: a primer", *BIS Quarterly Review*, September 2013

18 Source: Dealogic

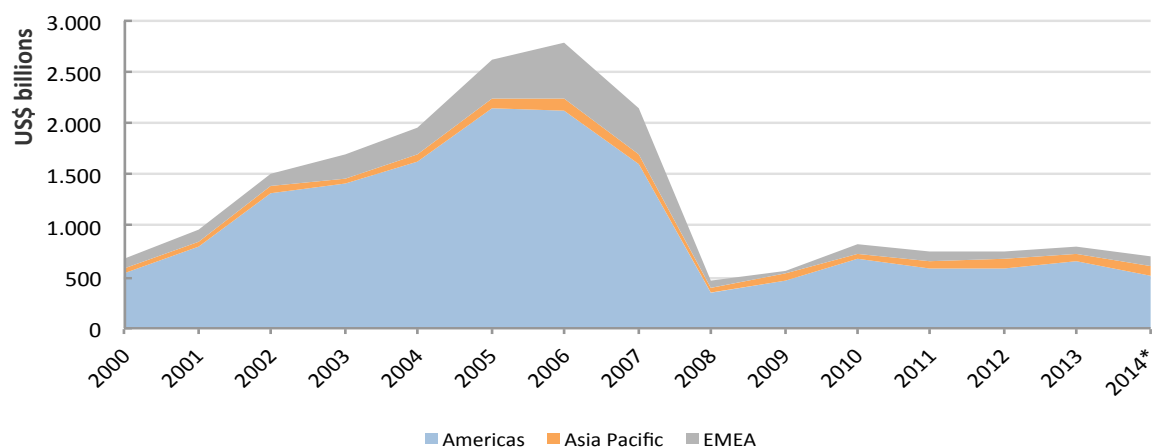
FIGURE 12: GLOBAL INITIAL AND SPECIAL PUBLIC EQUITY OFFERING OF FINANCIAL FIRMS



Source: Dealogic

Note: *Annualised 2014 is IOSCO Research Department projection

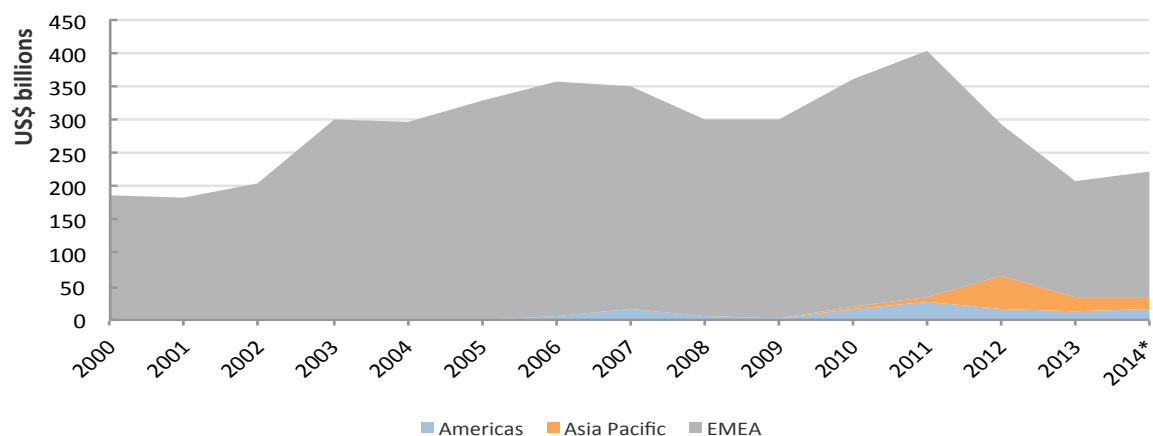
FIGURE 13: ISSUANCE OF SECURITISED PRODUCTS (MBS+ABS)



Source: Dealogic

Note: *Annualised 2014 is IOSCO Research Department projection

FIGURE 14: ISSUANCE OF COVERED BONDS



Source: Dealogic

Note: *Annualised 2014 is IOSCO Research Department projection

\$690 billion in 2014. Looking at regional differences, the US has generally made up around 80% of the global total. In 2014, issuances from the Americas are projected to fall as proportion, making up 76% of global issuance. In absolute terms, issuance is projected to reach \$523 billion. The European share has been declining from around 15% just before the crisis to a projected 10.5% in 2014. Also in absolute terms, the level of issuance in Europe is projected to decline for the third consecutive year in 2014, totalling \$72 billion. Asia-Pacific's share has been growing and is projected to reach 14% in 2014; in absolute terms, issuance in Asia-Pacific region in 2014 reached \$95 billion, near to peak levels before the crisis (\$102 billion in 2006).

Covered bonds constitute the main vehicle for collateralised borrowing in Europe. After 2006, covered bonds were issued in the Americas and after 2010, in the Asia Pacific (see Figure 14). Between 2002 and 2011, issuance of covered bonds averaged around \$320 billion. After a peak in 2011, issuance dropped to just \$209 billion in 2013. In 2014, issuance increased modestly to \$221 billion, with issuances from Europe making up most of the volume (\$186 billion), followed by Asia Pacific (\$19 billion) and the Americas (\$16 billion).

Repo markets are a vital source of secured short term funding...

Repo markets are a vital source of secured financing for banks and financial institutions. Repurchase agreements (repo) serve an important function by facilitating short sales and efficient securities settlement. Repos also are a key tool for the implementation of monetary policy. A repo is a sale of a security, typically in exchange for cash, coupled with an agreement to repurchase the same security at a specified price plus accrued interest at the end of the contract. Although repo contracts have been characterised historically by short maturities, firms recently have been entering into more and more longer-dated repos. Generally, repo contracts are fully collateralised, with the underlying collateral marked to market daily and subject to daily margin calls.

Since 2002, repo markets grew from 2002 until end 2007, when gross amounts outstanding reached

roughly \$10 trillion in each of the US and Eurozone repo markets.¹⁹ After the crisis the use of repos declined, and repos outstanding are expected to total only \$3.1 trillion in 2014.²⁰ In Europe, at close of business on December 11, 2013, the amount of repos and reverse repos outstanding on the books of the 68 institutions that participated in the latest European survey was €5.5 trillion (\$7.4 trillion).²¹ The UK market is about £600 billion (\$1 trillion).²² The figures on the European and UK market include both repo and reverse repo, and therefore overstate the size of the respective markets in comparison with the US, which counts only one side of the market.

In the US the majority of tri-party repo financing remains collateralised by assets that are eligible for use in Federal Reserve open market operations, such as Treasury securities, agency debentures, and agency mortgage backed securities (MBS). As of December 2013, these types of collateral accounted for 75% of all tri-party repo collateral. The remaining 25% of collateral used in tri-party repos includes corporate bonds, equities, agency and private label collateralised mortgage obligations, ABS, commercial paper (CP), other money market instruments, whole loans, and municipal bonds. Haircuts in the tri-party market have been stable in the last few years across all collateral classes, suggesting an unchanged market view towards collateral quality and potential price volatility.²³

1.4. Growing size of the asset management industry

Collective investment schemes: ongoing growth to all-time high levels of assets under management...

The asset management industry is continuing its long term trend of expansion. At year-end 2013, total assets under management (AuM) of collective

19 P. Hordahl and M. King, "Development in repo markets during the financial turmoil", *BIS quarterly Review*, December 2008

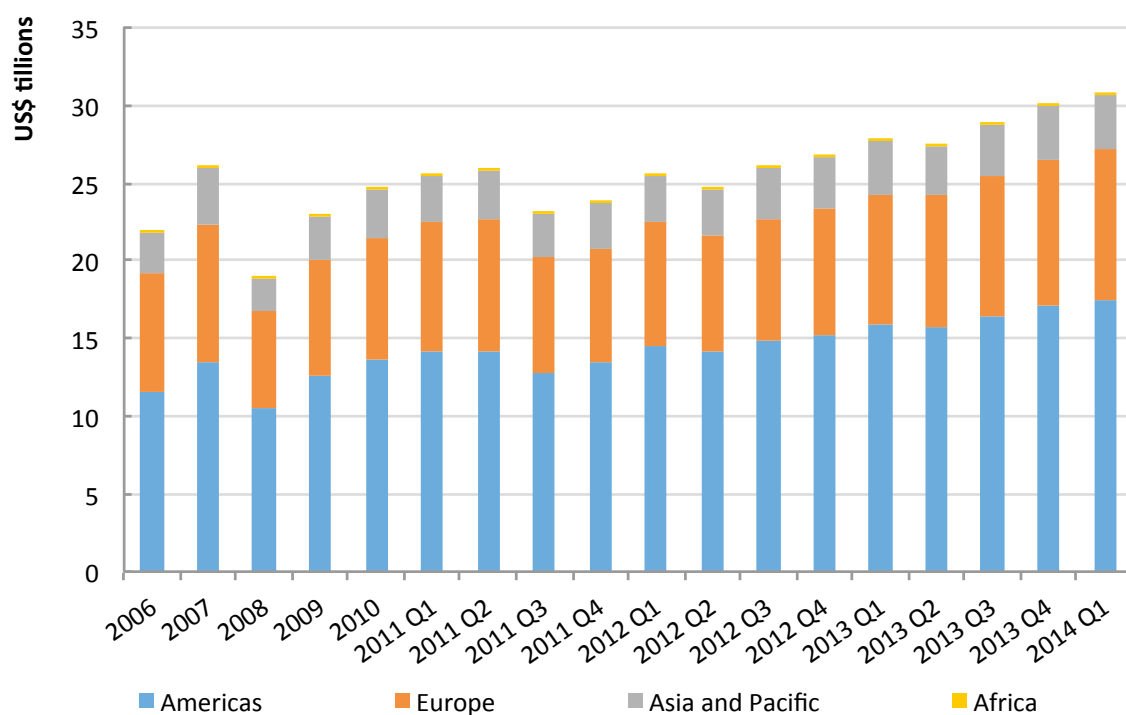
20 See "Lifting the veil on the US bilateral repo market" at <http://liberystreeteconomics.newyorkfed.org/2014/07/lifting-the-veil-on-the-us-bilateral-repo-market.html#U8ksOGcKCUk>

21 ICMA, *European Repo Market Survey*, January 2014.

22 Bank of England voluntary repo survey to 60 banks, figures as of February 2014

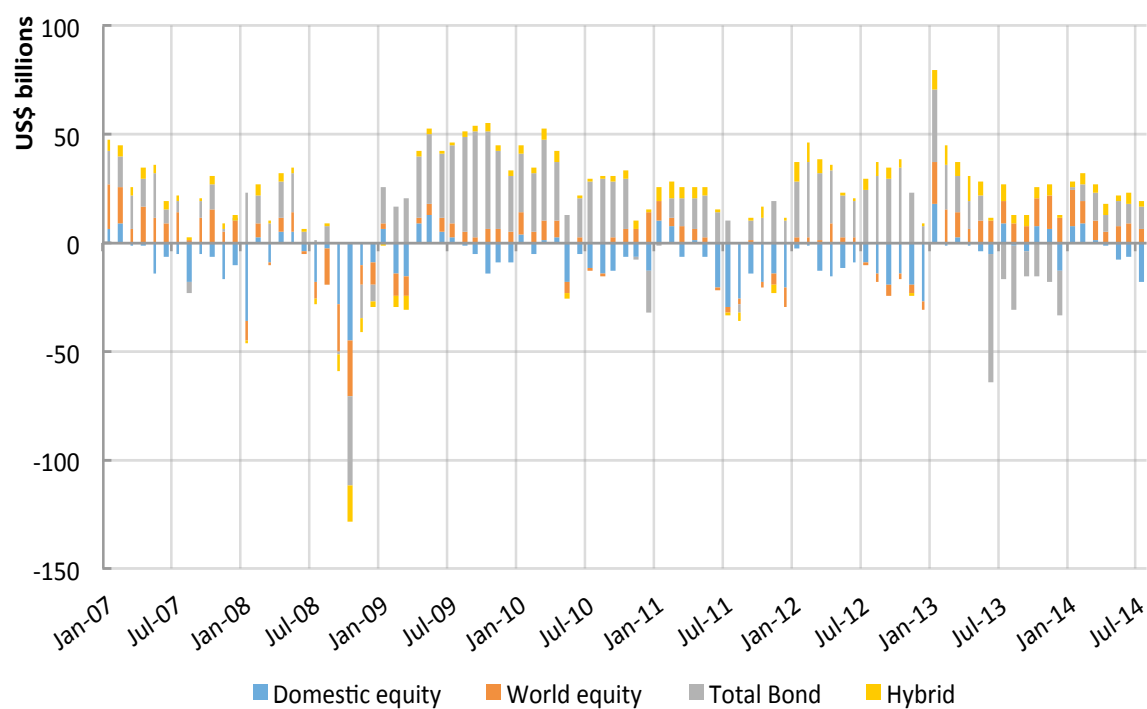
23 FSOC, *Annual Report*, 2014.

FIGURE 15: ASSETS UNDER MANAGEMENT GLOBALLY



Source: Investment Company Institute

FIGURE 16: NET FLOWS INTO MUTUAL FUNDS



Source: Investment Company Institute

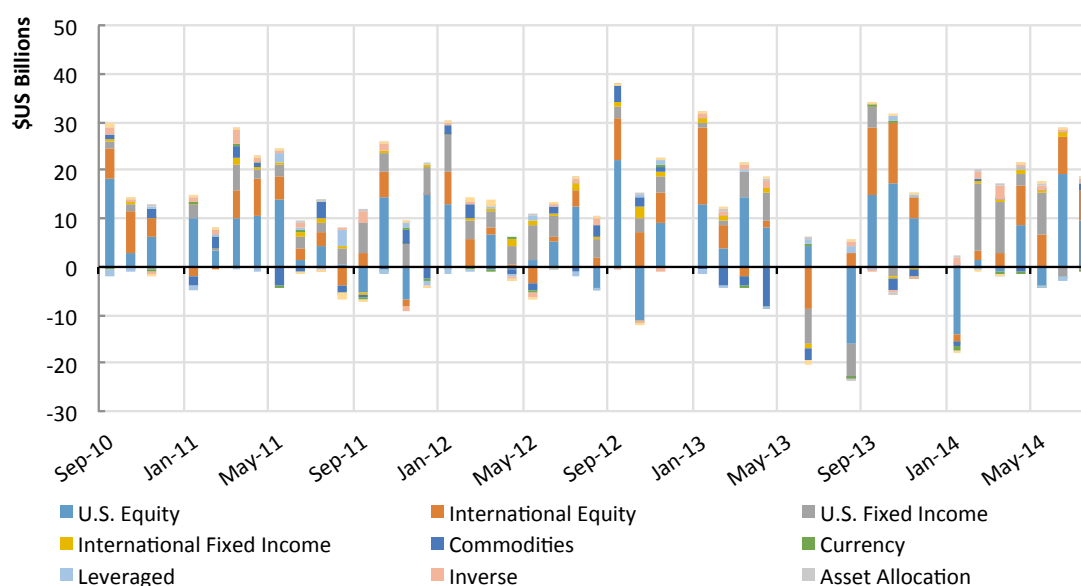
investment schemes (CIS, mutual funds) was \$30 trillion globally (see Figure 15). The industry is therefore an intermediary of growing importance between savings and investments. Almost 60% of the assets were located in the Americas, a third in Europe, and the rest in Asia-Pacific and Africa.

The growth of the assets under management of CIS is being fuelled by three underlying drivers. First, funds have benefited from a recovery in asset prices, especially equities, which has raised the value of the invested assets and thereby the AuM. Second, funds have remained a popular product with investors. Third, retirement savings through compulsory pension plans continue to grow in many

jurisdictions. The fund industry has experienced net investment inflows for much of the post-crisis period (see Figure 16). Exchange Traded Funds (ETFs) have also seen strong net sales in many periods (see Figure 17).

Figure 16 shows that from 2009 to early 2013 the inflows in mutual funds were mostly directed towards bond funds, while equity funds were preferred after that period. From June 2013 onwards some net outflow of bond funds were noted. This outflow was a reaction to the interest rate hike after the Fed's suggestion of tapering in May, which pushed down various bond prices and, as a result, the value of the bond mutual funds.

FIGURE 17: NET FLOWS INTO EXCHANGE TRADED FUNDS (ETFs)



Source: ETF.com

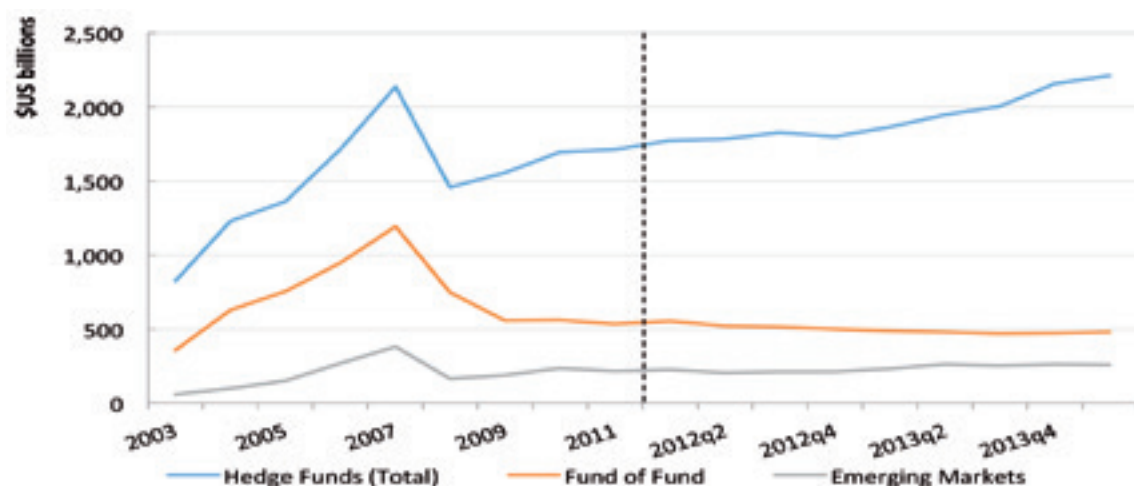
Hedge fund industry: growing assets under management

The expansion of AuM is also notable in the hedge fund industry. The global assets under management of hedge funds grew from \$825 billion in 2003 to \$2.2 trillion in the first quarter of 2014 (see Figure 18).

Market returns were a significant contributor to this growth as strong market returns elevate the value of

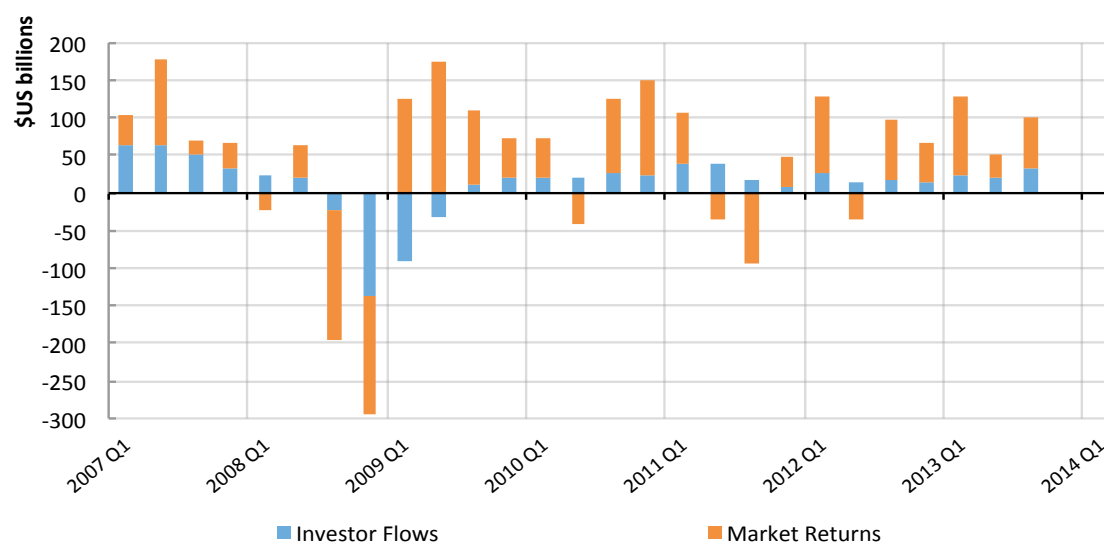
the assets under management. For example, in the third and fourth quarter of 2008 outflows did occur, coinciding with negative market returns (see Figure 19). To a lesser extent, growth has been spurred by new investments, predominantly from institutional investors such as pension funds. Since 2009, the value of AuM in fund-of-funds has been largely unchanged at around \$500 billion (Figure 18).

FIGURE 18: HEDGE FUNDS' ASSETS UNDER MANAGEMENT GLOBALLY



Source: BarclayHedge

FIGURE 19: THE INFLUENCE OF NET INFLOWS AND MARKET RETURNS ON THE AUM OF HEDGE FUNDS



Source: Credit Suisse

Chinese wealth management products could become a source of systemic risk...

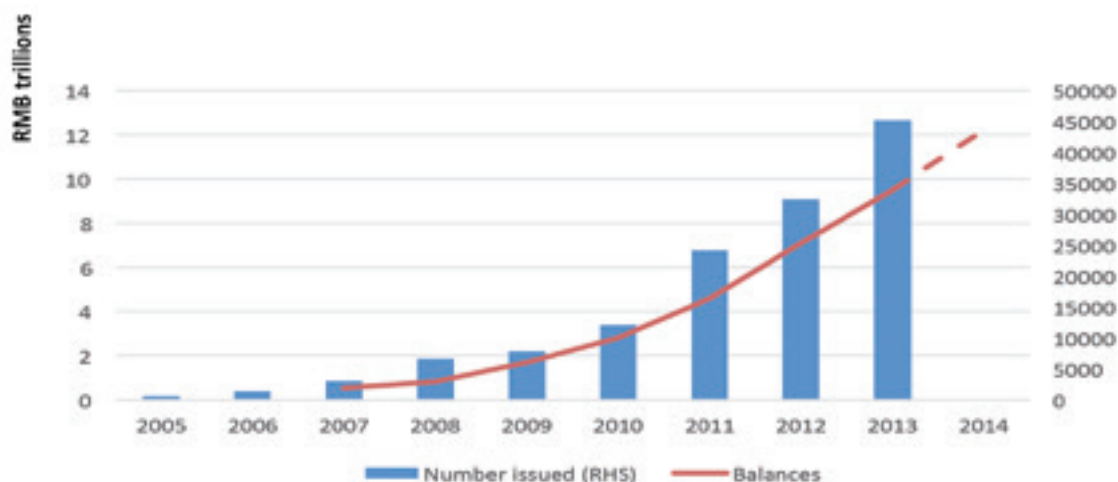
In China, wealth management products (WMPs) have attracted investors searching for additional yield compared to bank deposits. Chinese banks work closely with trust companies or other entities by packaging trust loans into WMPs. The products are often special purpose vehicles (SPVs) with assets related to property development, infrastructure projects, the manufacturing sector, and local

government financing vehicles.²⁴ These products are distributed by banks or independent financial advisors, who are not regulated.

The amount outstanding of WMPs is projected to exceed Rmb12 trillion at the end of 2014, equivalent to \$2 trillion (see Figure 20). There are more than 40,000 WMPs in circulation.

²⁴ See e.g. Federal Reserve Bank of San Francisco, *Shadow Banking in China: Expanding Scale, Evolving Structure*, April 2013

FIGURE 20: WEALTH MANAGEMENT PRODUCTS IN CHINA



Source: Wind Information

Anecdotal evidence suggests that many WMPs lack quality and transparency. Many of them are linked to local governments who unable to fund themselves through either bond markets because of the Chinese central government's ban²⁵ or from banks because of lending restrictions. Furthermore, consulted regulators and experts in China fear that some assets underlying these products are:

- > Dependent on real estate property that is not rented out;
- > Long-term infrastructure projects; or
- > Sometimes linked to high-risk land development projects, with no possibility of generating sufficient cash flow to meet repayment obligations.

Moreover, many WMPs are linked to a pool of assets rather than to a specific asset: the danger being the timing of the cash inflows may not match the schedules of the WMP repayments. Most WMPs carry tenures of less than a year, with many being as short as weeks or even days, posing liquidity or rollover risks for the issuer. The size,²⁶ the rapid growth, the lack of regulation, the interrelation with the banking system, the lack of transparency, and the

questionable quality of underlying assets, renders China's shadow banking sector a potential source of systemic financial risk.

In fact, in a scenario in which banks are faced with a liquidity shortage, the issuance of WMPs could provide relief by offering a means to repay maturing products. Anecdotal evidence suggests that the rollover of WMPs rests heavily on traditional bank reputations, because many investors are under the misconception that they will recover, at a minimum, their principle because they believe banks will not default. . Once investors lose confidence and reduce their buying, or withdraw from WMPs, a downward spiral in prices could hurt the reputation of banks, the trust in the financial system, and even the broader Chinese economy. Any contagion effects may not spread to the rest of the world, via the financial system, since the finance sector in China is not fully integrated into the global financial system (owing in part to capital and exchange rate controls). however, contagion could come from the impact on the global economy of an economic slowdown in China.

In order to prevent these financial risks from developing into a systemic threat, the Chinese government has indirectly enhanced supervision over these activities by instructing banks to strengthen their risk management.

25 However recently, authorities have given permission to develop municipal bond markets.

26 The WMP sector in China is almost as big as the total global hedge fund sector (\$2 trn versus \$2.2 trn)

1.5. Rising asset market valuations and fragmentation

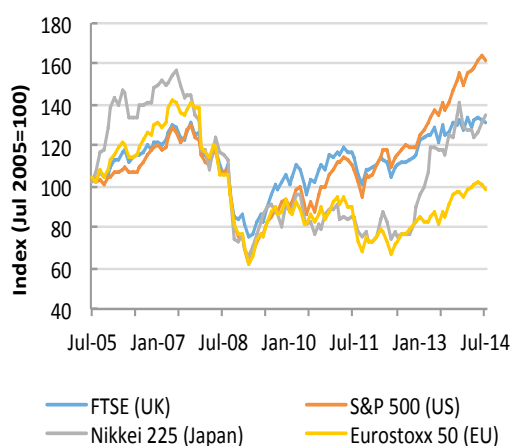
Equity markets continue to show high returns, while valuations are rising...

The equity markets of the main developed economies have continued to perform well over the last year with double digit returns (see Figure 21). Equity indices of most Austral-Asian exchanges have exhibited steady increase (see Figure 22), while other emerging markets (Russia, Mexico and Brazil) have declined in the wake of the Fed's suggestion of

tapering (see Figure 23). Volatility levels in general have returned to pre-crisis levels (see Figure 24).

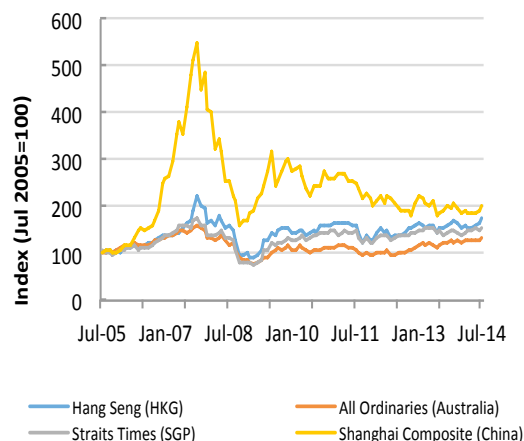
Figure 25 shows the rising valuation of equity markets in the US and Europe. In the US, both the Cyclically-Adjusted Price Earnings ratio (CAPE) and the alternative measurement Tobin's q show an increase of valuation above historical average. The CAPE for Europe shows also an upward trend, but valuation is still below the historical average. The CAPE for Australia and Hong Kong shows a flat trend since 2010 and valuations below historical averages.

FIGURE 21: PERFORMANCE OF SELECTED STOCK INDICES



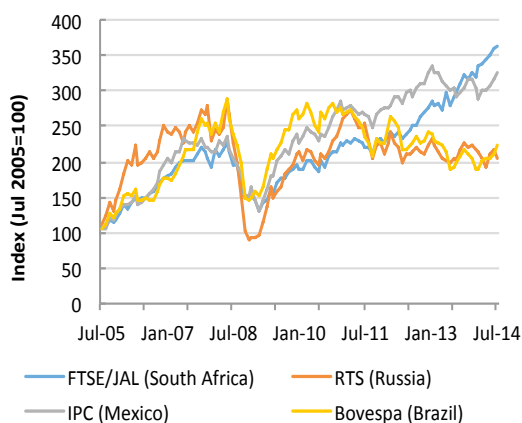
Source: Bloomberg

FIGURE 22: MARKET PERFORMANCE OF SELECTED ASIAN-PACIFIC EQUITY MARKETS



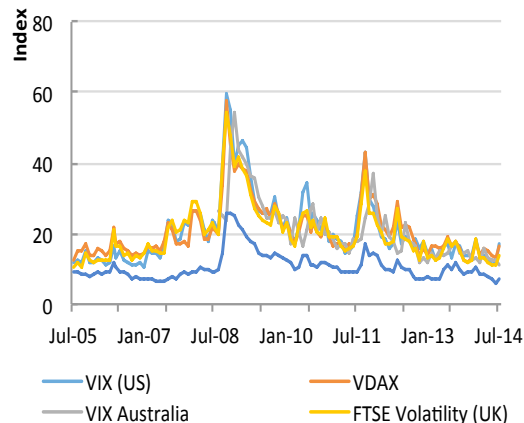
Source: Bloomberg

FIGURE 23: MARKET PERFORMANCE OF SELECTED EMERGING MARKET EQUITY MARKETS



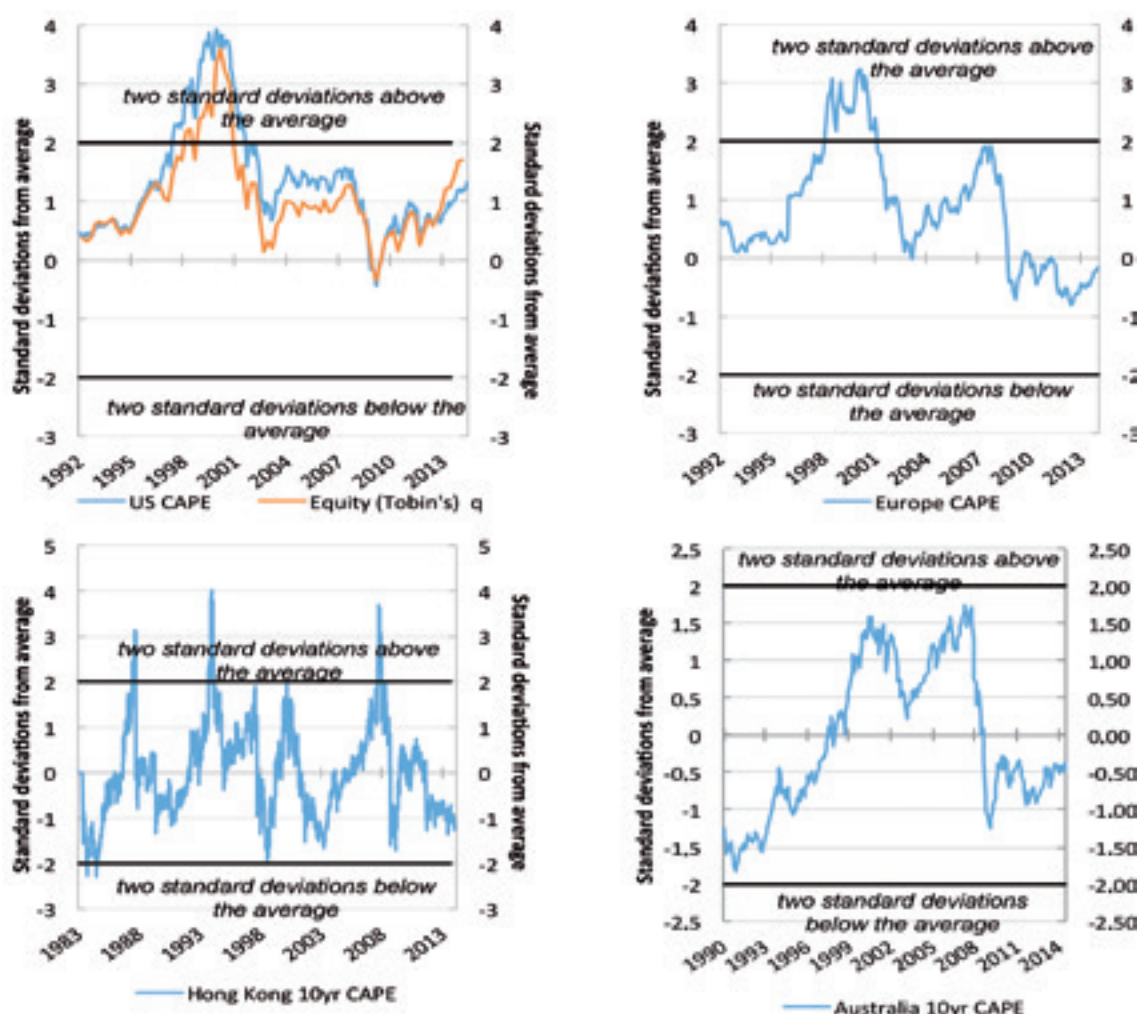
Source: Bloomberg

FIGURE 24: VOLATILITY INDICES OF SELECTED EQUITY MARKETS



Source: Bloomberg

FIGURE 25: CYCLICALLY-ADJUSTED PRICE EARNINGS RATIOS FOR SELECTED REGIONS



Source: Calculations by IOSCO Research Department based on data from Bloomberg, Shiller and the Australian Bureau of Statistics. European CAPE calculated and provided by ESMA – reproduced with permission

Equity markets continue to show fragmentation...

The equity markets in Europe, in the US, and in other parts of the world are experiencing a period of fragmentation: the same stocks are being traded in various trading venues at the same time. In addition, stocks are being traded in both lit venues and dark venues. The latter refers to venues that offer trading facilities that are usually unavailable to retail investors and in which pricing information is not pre-trade transparent. Since public transparency of trading venues varies across the globe, presenting a global overview of lit and dark trading is difficult. Available

data, predominately in the main securities markets, provides a snapshot of these developments.

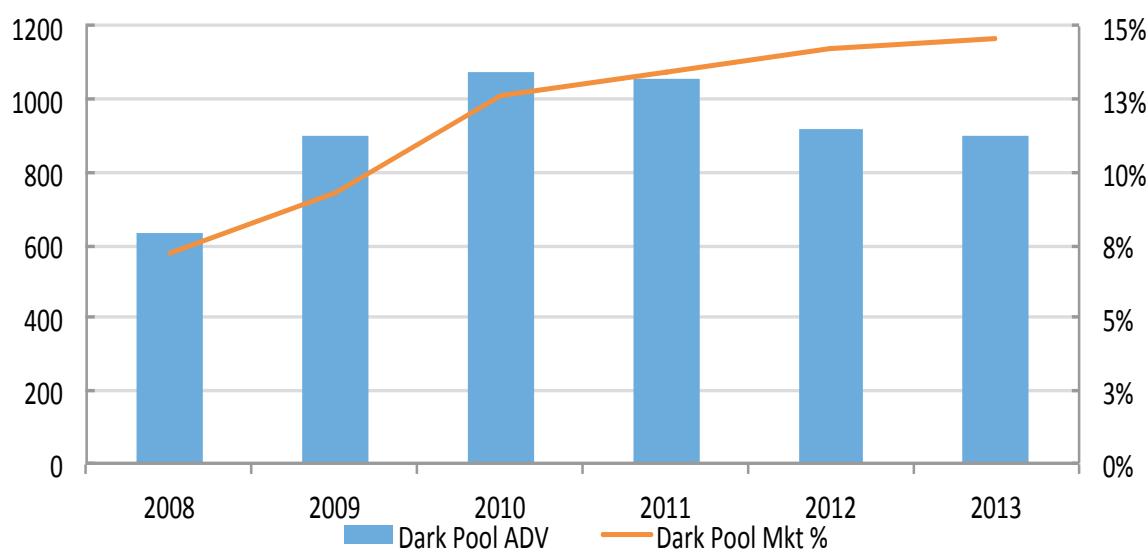
In the US, dark trading has nearly doubled between 2008 and 2013 (see Figure 26), to account for about 15% of all trading in 2013. The average daily volume traded on dark venues, however, has declined since 2010, suggesting that the value of the average trade has decreased.

In Europe, many trading venues have emerged and fragmentation is wide spread. Figure 27 indicates that the overall growth of value traded has surpassed the level of €50 billion (\$67.5 billion).

In Australia dark trading takes a number of different forms including large “block size” trades which must meet size requirements and below block size, which are typically broker and exchange operated dark pools or order types. In the past year broker operated crossing systems have experienced falling market share while exchange operated dark trading has been increasing (see Figure 28). The percentage of dark trading does not exceed 8%.

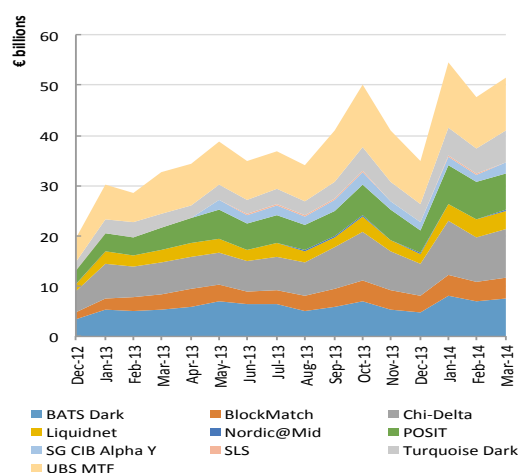
Canada has four dark trading venues (see Figure 29). However, dark trading has never exceeded 6% of the total number of shares traded (see Figure 30). Dark trading was halved in the fourth quarter of 2012 and remained below 3%. Dark liquidity turnover and venue trading preferences have been affected in both Australia and Canada by the introduction of price-improvement rules in recent years.

FIGURE 26: US AVERAGE DAILY VALUE OF DARK TRADING (LHS) AND MARKET SHARE (RHS)



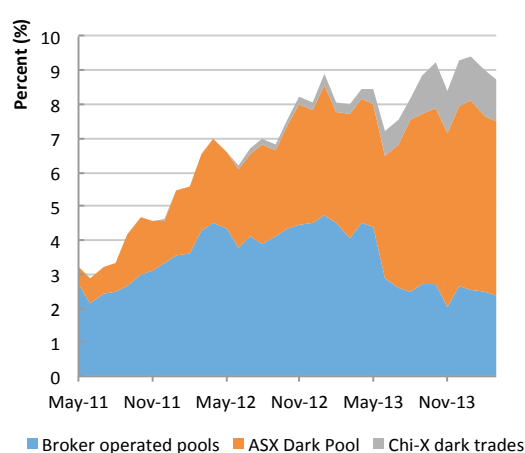
Source: Rosenblatt Securities

FIGURE 27: EUROPE: VALUE TRADED AT MONTH END OF DARK TRADING VENUES



Source: Markit Liquidmetrix

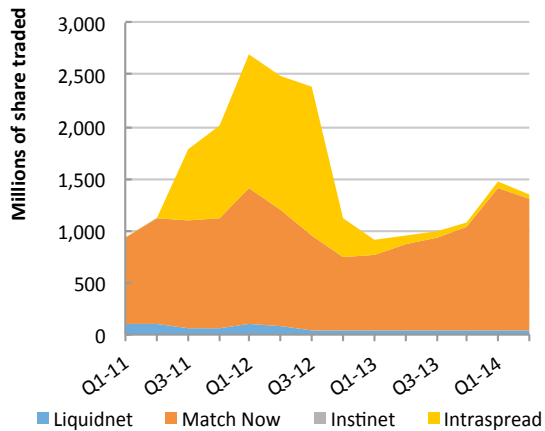
FIGURE 28: AUSTRALIA: DARK AND LIT TRADING, TRADING VENUES



Source: Australian Securities and Investment Commission (ASIC)

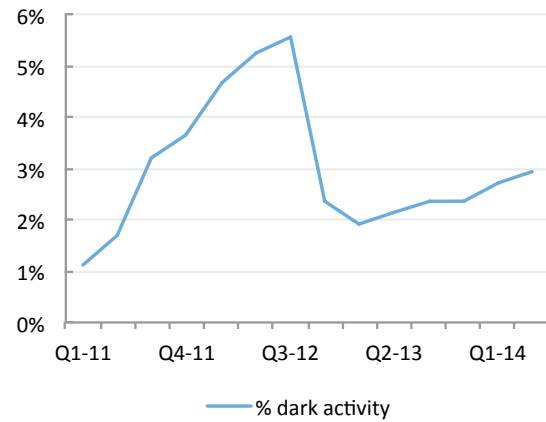
Note: Broker operated dark pools are referred to as Crossing Systems in Australia. The above figure does not include block trades outside crossing systems and below block trades reported outside exchange open hours.

FIGURE 29: CANADA: DARK AND LIT TRADING, TRADING VENUES



Source: IIROC (Investment Industry Regulatory Organization of Canada) and Thompson Reuters

FIGURE 30: PERCENTAGE OF DARK TRADING - CANADA



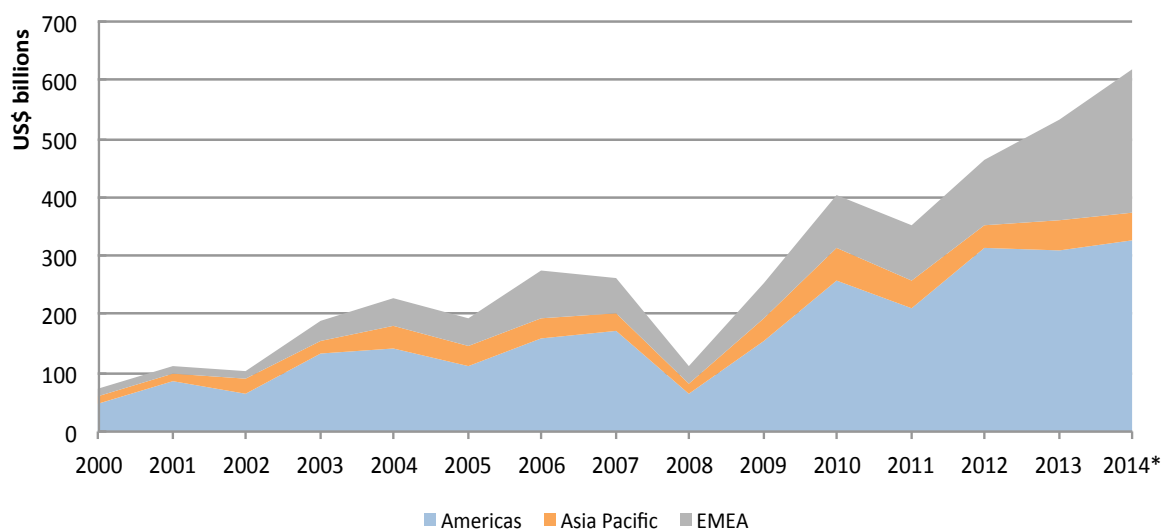
Source: IIROC (Investment Industry Regulatory Organization of Canada) and Thompson Reuters

Debt markets show high levels of high yield bond issuances combined with low yields...

High yield bond issuances have increased globally since the crisis. In 2014, high yield issuances are projected to reach \$617 billion, an increase of

approximately 16% with regard to the preceding year (see Figure 31). In fact, since 2008, issuance of high yield bonds has been experiencing year-on-year growth averaging around 40%. In the Americas, high yield bond issuance is projected to reach \$325 billion in 2014; \$48 billion in Asia Pacific and \$245 billion in EMEA.

FIGURE 31: HIGH YIELD BOND ISSUANCE



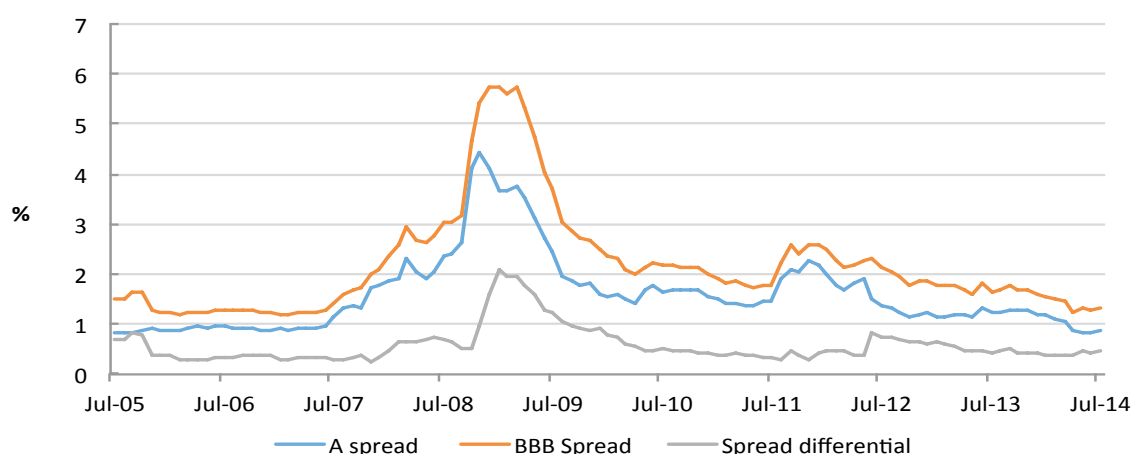
Source: Dealogic

Note: * Annualised 2014 is IOSCO Research Department projection

High yield bonds are bought by investors seeking a higher yield than that of lower risk bonds such as US Treasuries, despite the potentially higher credit risk. Figure 32 shows that since the end of 2011 the yield differential between corporate bonds and US Treasuries has been decreasing, pointing to increasing

investor demand, with A-rated (investment grade) corporate bonds now yielding 85 basis points above Treasuries and BBB-rated corporate bonds (high yield) yielding 130 basis points above treasuries. The spread differential between investment grade and high yield bonds is 45 basis points.

FIGURE 32: INTEREST RATE DIFFERENTIAL BETWEEN A- AND BBB-RATED CORPORATE BONDS IN THE U.S. WITH THE 10-YEAR TREASURY BILLS, AND THE SPREAD DIFFERENTIAL BETWEEN A- AND BBB-RATED BONDS



Source: Bloomberg

The yield differential with US Treasuries is at very low levels due to historically low interest rates, combined with low default rates on both investment grade and high yield corporate bonds and the demand for yield. Potentially higher interest rates in the near-term will create both winners and losers. An interest rate increase may actually have greater 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%. However, this low default rate may be partially explained by the maturity extension that occurred in previous years.

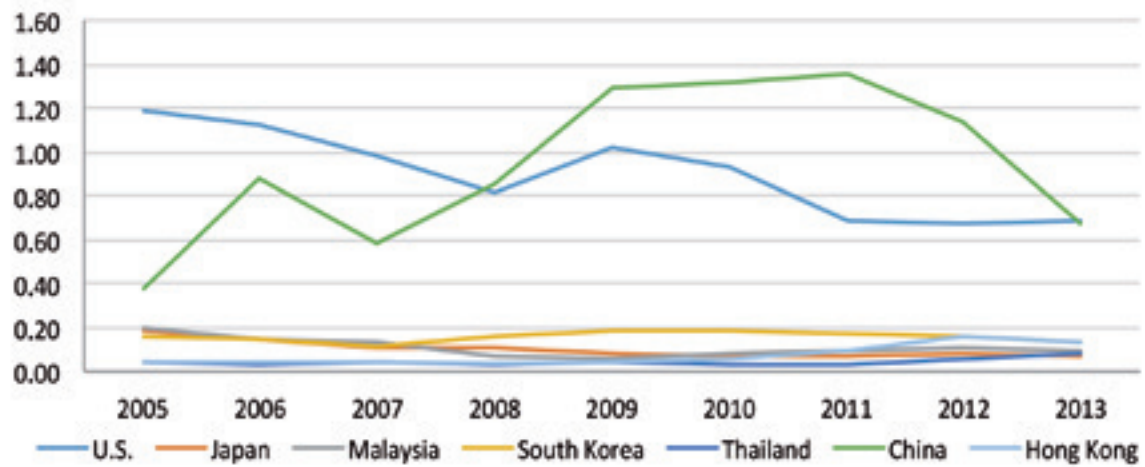
Corporate bonds are traded much less frequently than equities. Corporate bonds tend to be less standardised than equities and are therefore traded less after issuance. In some parts of the world secondary markets for corporate bonds are also not centralised on exchanges or trading platforms, but rather traded bilaterally. Without reported trades, data on the secondary market are limited. However,

other jurisdictions have reliable data that provide an indication of secondary market trading trends. In the US, for example, traders have the obligation to report their trades to a centralised system called TRACE. Since 2005, the corporate bond turnover ratio,²⁷ a measure of secondary market liquidity, has decreased in the US, Japan and Malaysia, while it has increased in China and Hong Kong (see Figure 33). Both the US and China have more active bond markets than the other selected countries: the turnover ratio is approximately 0.7 which is around five times greater than the other countries cited. However, the bond turnover ratio is just one measure of secondary market liquidity and can be biased by unusual market conditions and phantom liquidity.²⁸

²⁷ 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.

²⁸ For further discussion see: Rohini Tendulkar and Gigi Hancock, "Corporate Bond Markets: A Global Perspective", *IOSCO Research Department Staff Working Paper*, April 2014

FIGURE 33: TURNOVER RATIOS OF SELECTED SECONDARY BOND MARKETS



Source: SIFMA, Asian Bonds Online.

Note: data for 2013 is based on last available (March, June and September)

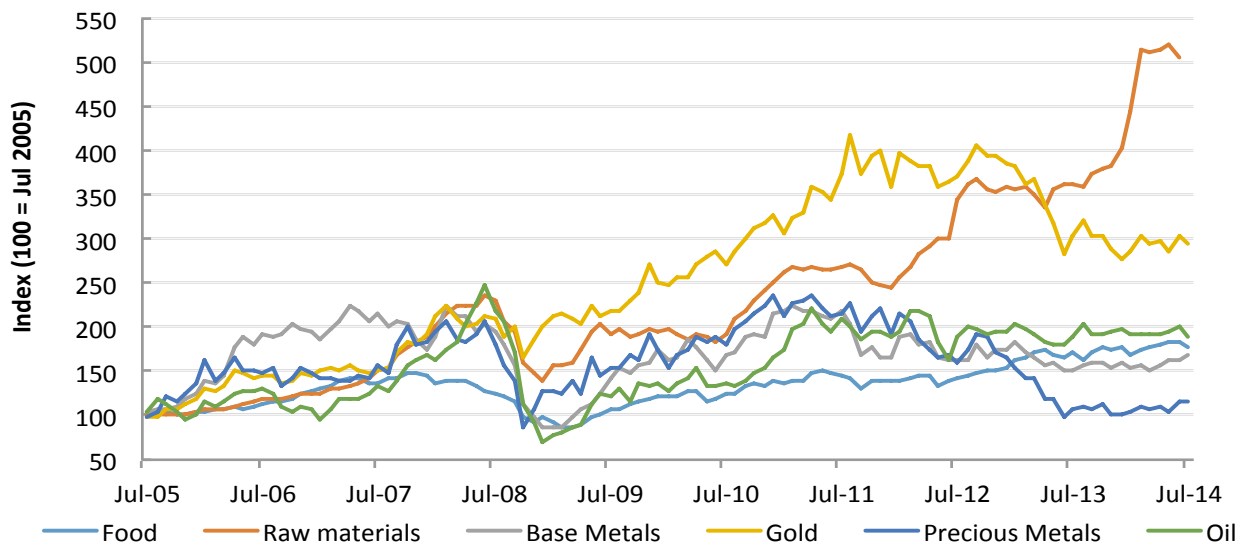
Commodity markets: disconnection with equity markets is returning...

Commodity markets show varying trends (see Figure 34). The gold price has declined around 25% from its post-crisis peaks in 2011 and 2012. The same is true for other precious metals. In contrast, raw materials experienced a strong upward trend, increasing by

about 25% over the last 12 months. More recently, they have been flat. Oil, base metals and food stayed virtually unchanged during the same period.

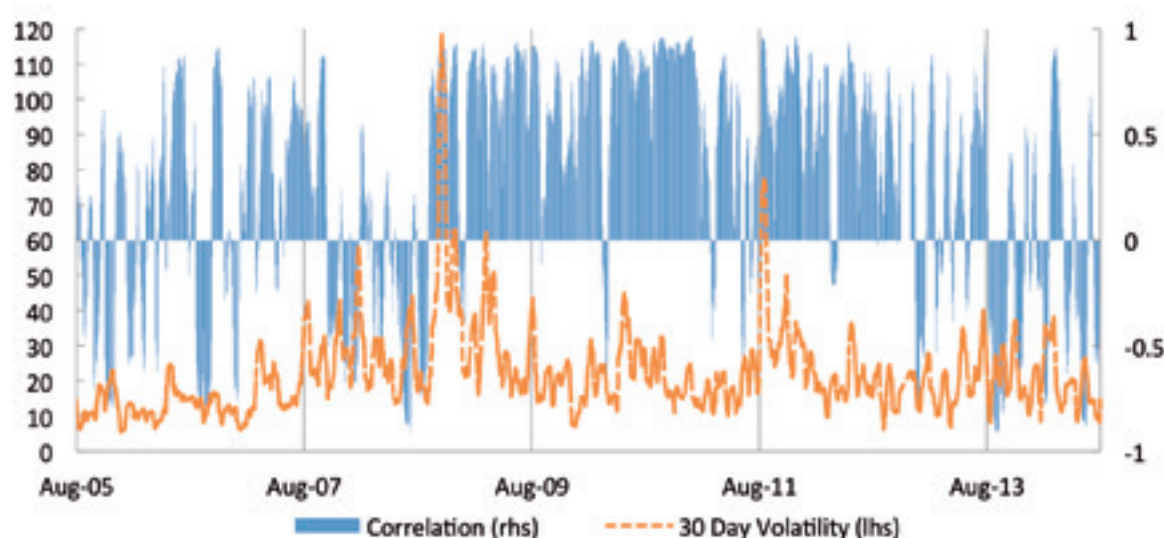
The 30-day correlations between equity prices and commodities prices as seen in Figure 35 increased in late 2008 and stayed high and positive until

FIGURE 34: THE PRICE DEVELOPMENTS IN COMMODITIES



Source: Bloomberg

FIGURE 35: CORRELATION BETWEEN EQUITY AND COMMODITY PRICES AND VOLATILITY EQUITY PRICES



Source: IOSCO Research Department

mid-December 2012.²⁹ Since then the correlation of commodities with equity has shown a varying pattern with periods of strong negative correlations followed by short periods of moderate positive correlation. This suggests a possible reversal to a correlation pattern more typical to that prior to the crisis. Furthermore, bank involvement in trading on commodities markets is dwindling as various banks are selling their commodities trading activities.

1.6. Growing derivatives markets and increasing central clearing

Derivatives markets have gone through significant change in the years since the financial crisis. The crisis highlighted a number of vulnerabilities in this sector, including its opacity and difficulty in managing counterparty risk. To address these issues, the G20 recommended a series of reforms, including trade reporting, central clearing and exchange trading of standardised contracts. Trade reporting is well under way in a number of jurisdictions and the first steps towards central clearing have already been taken.

²⁹ The correlation was computed between Bloomberg's DJUBS index (a.k.a. Dow Jones-UBS Commodity Index) and S&P 500 index. The volatility indicator is the 30-day Volatility for S&P 500 and is also from Bloomberg. Based on data up to 31st July 2014

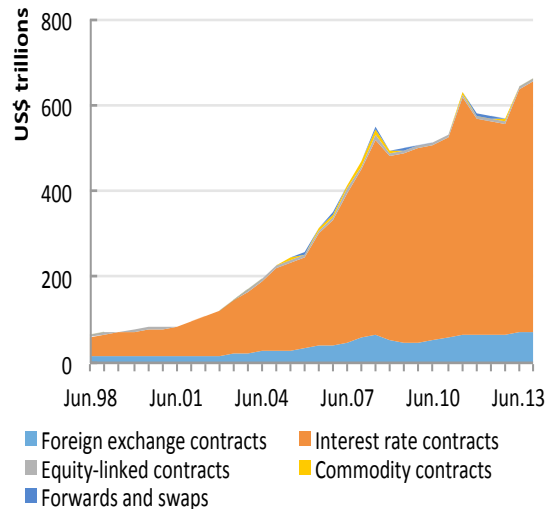
In this changing environment global OTC activity remains strong. As reported by the BIS, the GNE across all products grew 11.5% from \$632 trillion in December 2013 to \$710 trillion in June 2014. As Figure 36 highlights, the largest part of that increase was for interest rate contracts.

Credit default swaps: declining activity...

Credit Default Swaps (CDS) markets are an exception in the overall growth of derivatives markets and show a recent decline in activity. This partly reflects the reduced risk of default by firms and sovereign credits, as evidenced by the drop in sales of CDSs as a form of insurance. Figure 37 shows a decline from \$32 trillion in GNE in the first half of 2011 to \$21 trillion in the second half of 2013. Approximately 75% of CDS trading activity is done with offshore counterparties.

Figure 38 highlights the different segments of the single-name CDS markets. The biggest segment, CDSs issued on corporate debt, has shown a steady decline since December 2011. Likewise, there has been a continued decline in CDS on asset backed securities (CDS ABS). The decline has been across the board in both CMBS and RMBS in the US and Europe. In July 2014, the size of the CDS ABS market

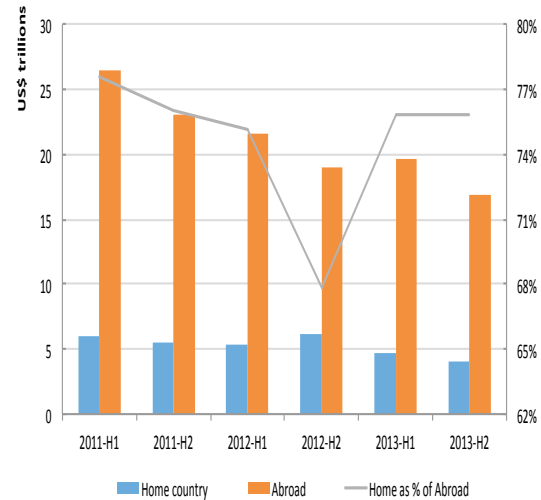
FIGURE 36: NOTIONAL OUTSTANDING OF OTC DERIVATIVES MARKETS



Source: Bank for International Settlements

Note: The BIS data counts swaps outstanding; with no adjustment for if the swap is un-cleared or cleared (and hence through novation one swap is replaced by two swaps)

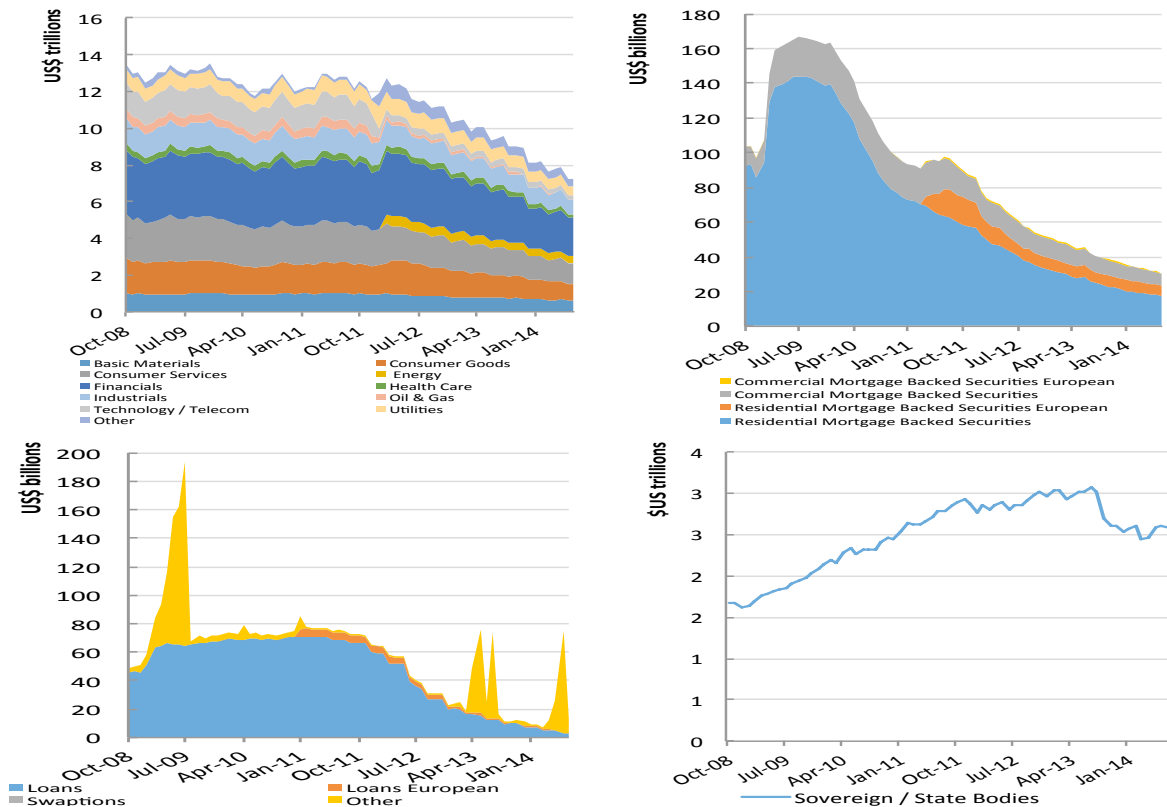
FIGURE 37: PROPORTION OF CDS ACTIVITY SEPARATED BY LOCATION OF COUNTERPARTY



Source: Bank for International Settlements

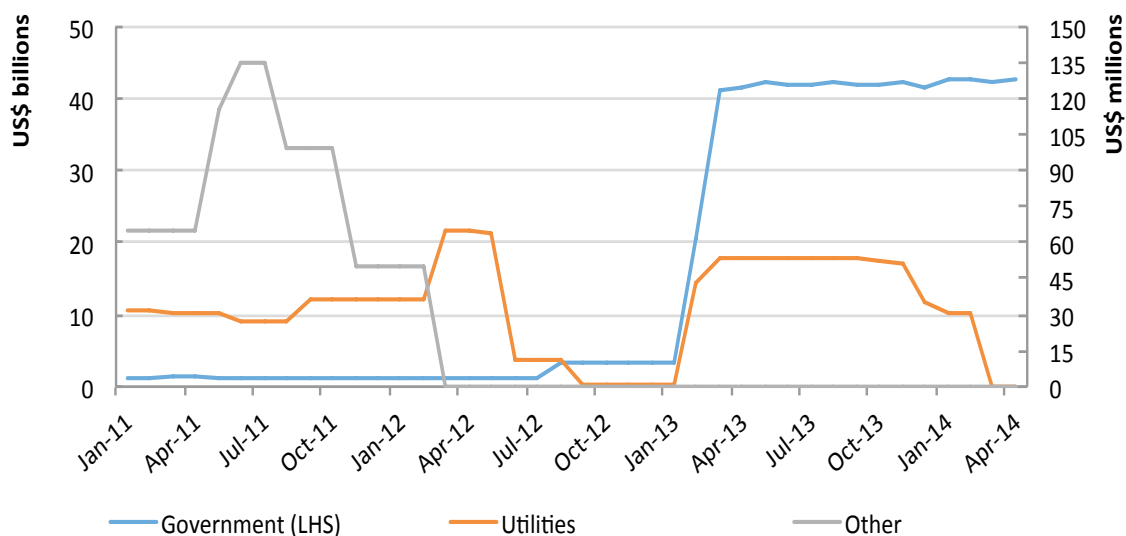
Note: 1) "Home country" indicates the counterparty to the swaps transaction is domiciled in the same country as the reporting entity; 2) "Abroad" indicates the counterparty to the swaps transaction is domiciled in a different location to the reporting entity.

FIGURE 38: TRENDS IN SELECTED OTC CREDIT DEFAULT SWAPS MARKETS



Source: DTCC OTC Data Repository

FIGURE 39: CDS GROSS NOTIONAL EXPOSURE ON MUNICIPAL BOND MARKETS



Source: DTCC OTC Data Repository

was \$33 billion, down 65% from April 2011 when recordkeeping for the European markets began. CDS on sovereign issuances have also declined 15%, since peaking in April 2013 (see Figure 38).

CDS in municipal bonds are one market segment that has seen growth over the past year. In January 2013 the GNE of CDS in this market increased ten-fold to over \$40 billion and has remained at this level (see Figure 39). The cause for this increase is not entirely clear from the data, however it is worth noting that the number of defaults on municipal bonds has significantly increased over the last few years³⁰ and the Puerto Rico default debate came up at the end of 2013,³¹ shortly before the increase in the figures.

Interest rates swaps

The Interest Rate Swap (IRS) market has shown some declines in activity in the past 12 months. The latest data on IRS markets from the Depository Trust & Clearing Corporation (DTCC) state that notional amounts outstanding totalled \$425 trillion at end-July 2014. Of this total, \$300 trillion corresponded to “vanilla” swaps and \$75 trillion to Overnight Index Swaps (OIS) (see Figure 40). Notional

amounts increased substantially between April 2013 and December 2013, due largely to increases in IRS and OIS GNE.

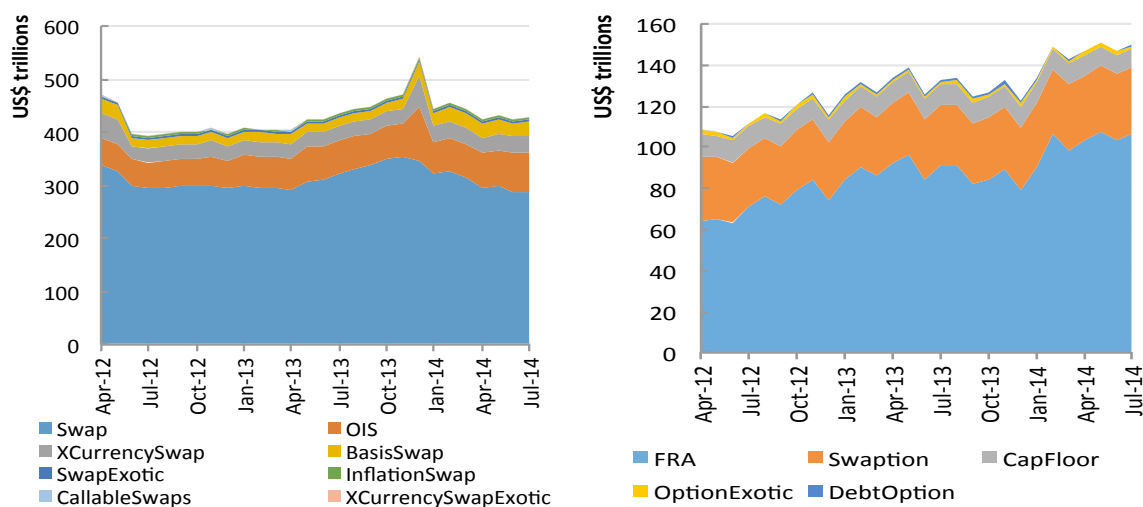
By December 2013, notional outstanding in the IRS market was \$540 trillion. By July 2014, the market across all segments had fallen 23%. The largest declines were in the OIS and Cross-currency swap market, which fell 32% and 65%, respectively. Forward rate agreements and other interest rate derivatives, in contrast, totalled \$150 trillion in July 2014, an increase of 30% from December 2013. Trade compression figures also highlight that the overall “real” gross notional exposure of the market is stable. Data from LCH Clearnet (LCH) shows that while GNEs continue to increase, this increase is more than offset by trade compression (see Figure 41).³²

30 See e.g. Moody’s, *Municipal bond defaults have increased since financial crisis, but numbers remain low*, May 2013

31 See e.g. The Economist, *Puerto Pobre. A heavily indebted island weighs on America’s municipal-bond market*, 23 October 2013

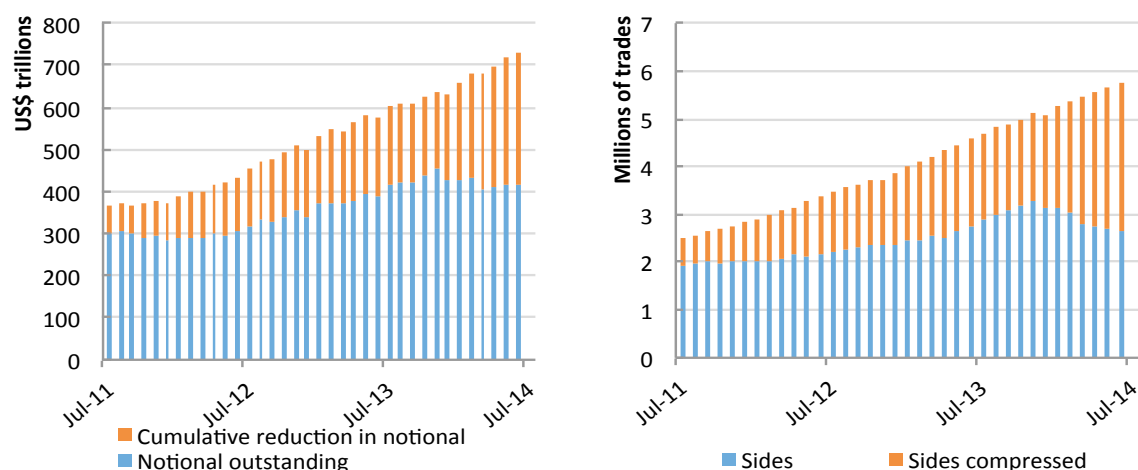
32 The demand for compression is likely to increase as clients and members seek to manage their collateral in the most efficient manner possible. Chicago Mercantile Exchange (CME) clearing is planning on introducing compression for IRS. The Clearing Corporation of India Limited (CCIL), the Indian CCP, has in its latest portfolio compression run (13 March 2014), achieved a compression rate of 85.2%, reducing the outstanding notional value of IRS trades in the market to INR 1,986,000 as in September 2013. [See CCIL 2013 Factbook]

FIGURE 40: TRENDS IN SELECTED OTC INTEREST RATE SWAPS MARKETS



Source: DTCC OTC Data Repository

FIGURE 41: THE EFFECTS OF TRADE COMPRESSION ON OVERALL NOTIONAL EXPOSURE



Source: LCH Clearent

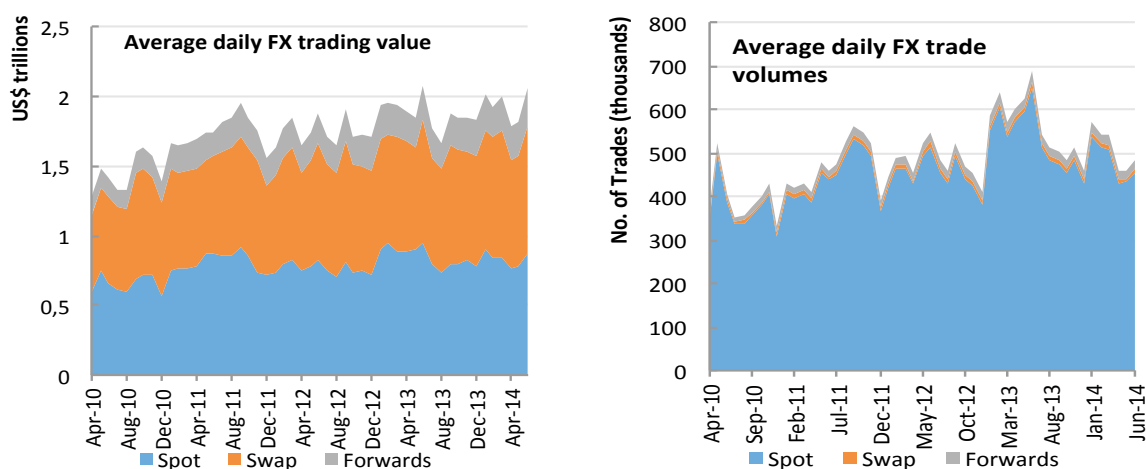
Foreign Exchange Markets

Global Foreign Exchange (FX) volumes continue to increase in the YTD July 2014. According to data provided by Continuous Link Settlement (CLS) Group (see Figure 42), global level average daily turnover climbed to \$2 trillion per day in June 2014; an increase of 16% from December 2012. While trading value continues to increase, trading volume has decreased from its all-time high of 688,000

contracts per day in June 2013. In June 2014, average daily trading volumes were 457,000 contracts per day.

Across the different product segments, the growth in trading volumes by value is predominately driven by growth in the FX swaps and outright forwards markets. In terms of value, the swaps segment accounts for the largest part of the overall FX market, while the spot market continues to remain the most heavily traded by number of contracts.

FIGURE 42: FOREIGN EXCHANGE MARKET TURNOVER BY VALUE AND VOLUME



Source: CLS Group

Notes: The data only reports the bought currency values, or one leg of the trade, to avoid double counting the total amount traded and the near leg of FX swaps are excluded

Trends in Central Clearing

The 2009 Pittsburgh G20 Leaders declaration stated that “*All standardized OTC derivative contracts should be traded on exchanges or electronic trading platforms, where appropriate, and cleared through central counterparties*”. Since then, jurisdictions have been moving towards implementation. Central clearing has been on the increase. Table 3 highlights the global availability of central clearing, including the products that are eligible for central clearing, and the growth of the GNE cleared through each CCP. Additionally, the amounts that are being placed through CCPs, based on notional dollar values, are also increasing (see Table 4).

For IRS and CDS products, the volume and number of cleared transactions have increased (see Figure 43). According to CFTC Swaps report data, the weekly open interest in IRS markets was \$335 trillion, of which \$205 trillion was centrally cleared at the end of July 2014 (or 61% of the market, up from approximately 45% in October 2012). Although the size of the overall IRS market has declined, the percentage of the market that is cleared continues to increase. A similar trend exists in the CDS market. In April 2014, the weekly open interest in CDS was \$8 trillion, of which \$3 trillion was centrally cleared. This is about 30% of the market, three times more than in October 2012. The cross-currency market, however, still remains uncleared (see Figure 44).

TABLE 3: GLOBAL AVAILABILITY OF CENTRAL CLEARING – AS AT YEAR END 2013

CCP	Product	Equities	Bond	Interest Rate	Credit	Commodity	FX	Other
CME		Yes	Yes	Yes	Yes	Yes	Yes	Yes
OCC		Yes	Yes	No	No	Yes	Yes	ETFs
SIX xClear		Yes	Yes	No	No	Yes	No	No
ICE Clear		Yes	No	No	Yes	Yes	Yes	No
Eurex		Yes	Yes	Yes	Yes	Yes	No	Yes
LCH Clearnet		Yes	Yes	Yes	No	Yes	Yes	No
HKFE Clearing		Yes	Yes	Yes	No	Yes	Yes	No
ICE Clear Europe		No	No	No	Yes	Yes	Planned	No
CME Clearing Europe		No	No	Yes	No	Yes	No	No
LCH Clearnet Europe		Yes	Yes	No	Yes	Yes	No	No
SGX -DC		Yes	Yes	Yes	No	Yes	Yes	No

Source: Thomas Murray Data Services

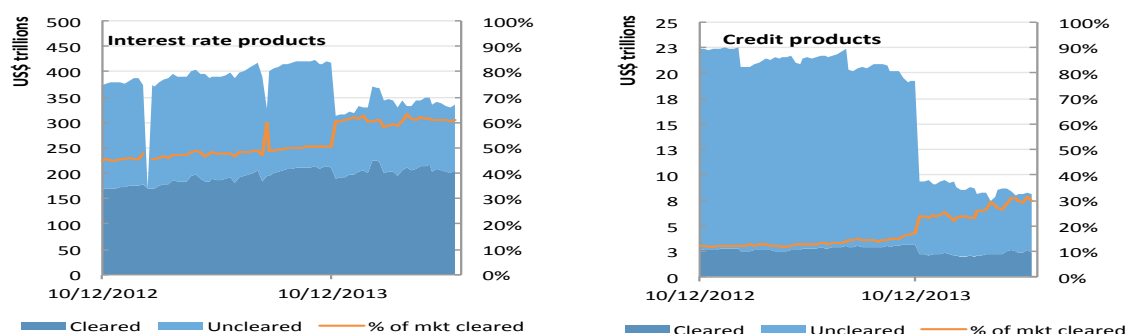
TABLE 4: NOTIONAL VOLUMES, GROWTH OF CLEARING BY SELECTED CCPS, IN \$US BILLIONS

CCP	Metric	Region	Product	Dec-11	Dec-12	Dec-13	% Chg ~
LCH/Swapclear	Notional Outst.	EU	IRS	\$283,000	\$369,000	\$426,000	14%
CME	Notional Outst.	US	IRS	\$114	\$1,600	\$16,000	230%
Japan SCC		Asia	CDS	-	\$3,220	\$5,808	59%
Japan SCC	Notional Outst.	Asia	IRS	-	\$1,280	\$5,560	147%
CLS		Global	FX	\$4,380	\$4,610	\$4,870	5%
ICE	Open Interest	US	CDS & CDX			\$891	
ICE	Open Interest	EU	CDS & ITRAXX			\$342	
SGX	Notional Outst.	Asia	IRS	\$113	\$126	\$123	-2%
Singapore Ex	Gross	Asia	IRS	-	-	\$299	
LCH	Open Interest	EU	CDS & ITRAXX	\$68	\$135	\$260	66%
LCH Forexclear	Notional Outst.	EU	FX	\$5	\$91	\$115	23%
CME		US	CDX	\$15	\$98	\$97	-1%
HKEx	Notional Outst.	Asia	IRS	-	-	\$59	
NYSE/ LIFFE Bclear	Open Interest	UK	IRS; Equities; Commodities	€29	€31	€30	-2%
Eurex		EU	IRS;	-	\$1	\$21	304%
HKEx	Notional Outst.	Asia	FX	-	-	\$20	
OMX Nasdaq	Open Interest	Europe	IRS	-	\$0.0	\$0.2	287%
Shanghai	Notional Outst.	Asia	IRS	-	-	\$0.8*	

Source: IOSCO Research Department; compiled from data from CME, Singapore Exchange; LCH.Clearnet, Japan Securities Clearing Corporation, International Clearing Exchange, CLS Group; NYSE, Hong Kong Exchange; Shanghai Exchange; Nasdaq OMX, BClear, TheOTCSpace

Notes: 1) ~ Percentage change is calculated as the change between Dec 2012 and Dec 2013; 2) *Data as at January 2014

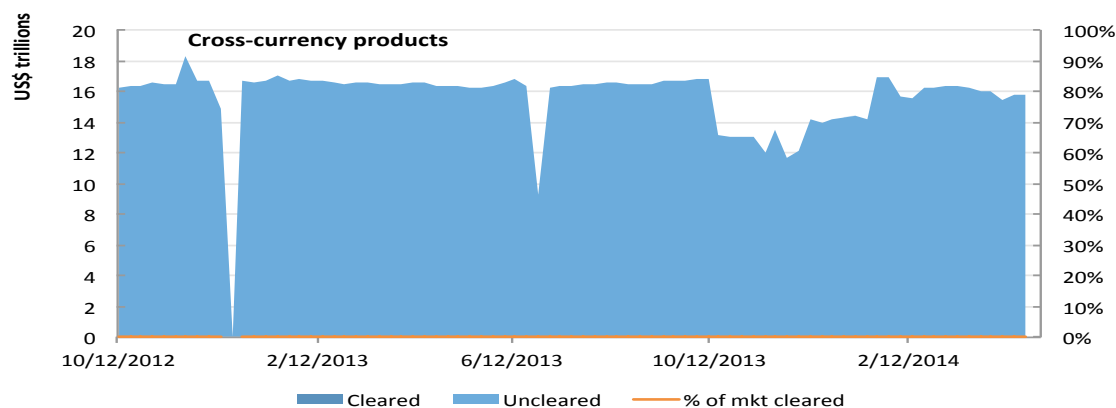
FIGURE 43: TRENDS IN CENTRAL CLEARING OF SELECTED OTC MARKETS



Source: CFTC Swaps report

Note: The CFTC Swaps report output exhibits two key adjustments to the raw data; 1) only one side of the cleared trades is counted, analogous to open interest in futures, 2) the report excludes trades between affiliated swap dealers and targets on "public facing" trades (e.g. If Bank A's swap dealer subsidiary trades a swap with Bank A's other swap dealer subsidiary, the trade is excluded)

FIGURE 44: TRENDS IN CENTRAL CLEARING OF SELECTED OTC MARKET



Source: CFTC Swaps report

1.7. Growing capital flows in emerging markets and impact on securities prices

Securities markets in emerging markets (EMs) are beginning to play an important role in nurturing growth at the same time that cross-border bank lending from developed markets is falling. As a result, EMs and their securities markets are becoming critical contributors to global financial activity.

Capital flows: inflows in debt markets, outflows in equity markets...

Historically, the majority of inflows into Emerging Africa and Middle East have been in the form of Foreign Direct Investment (FDI),³³ with the exception of 2007 where bank credit inflows reached a peak of \$80 billion eclipsing other forms of inflows. In 2013, FDI reached \$32 billion, below pre-crisis levels. In 2014, FDI in MEA is forecasted to reach \$34 billion.

Bank credit inflows to MEA grew before 2007, but the onset of the financial crisis reversed this trend and with negative net inflows in 2010 (of almost \$1 billion). By 2013, inflows of bank credit had revived and the MEA region experienced inflows of \$12 billion for the year. Interestingly, non-bank credit flows into MEA have exceeded bank credit flows since 2009 reaching \$16 billion in 2013. In 2014, bank and non-bank credit inflows are projected to reach \$12 billion and \$14 billion respectively.

Looking at securities markets' flows specifically, portfolio equity inflows have been generally negative over the time period analysed and are projected to reach -\$19 billion in 2014.

Before the onset of the crisis, capital flows into Latin America were also dominated by FDI, which reached \$66 billion in 2008. However, since 2009,

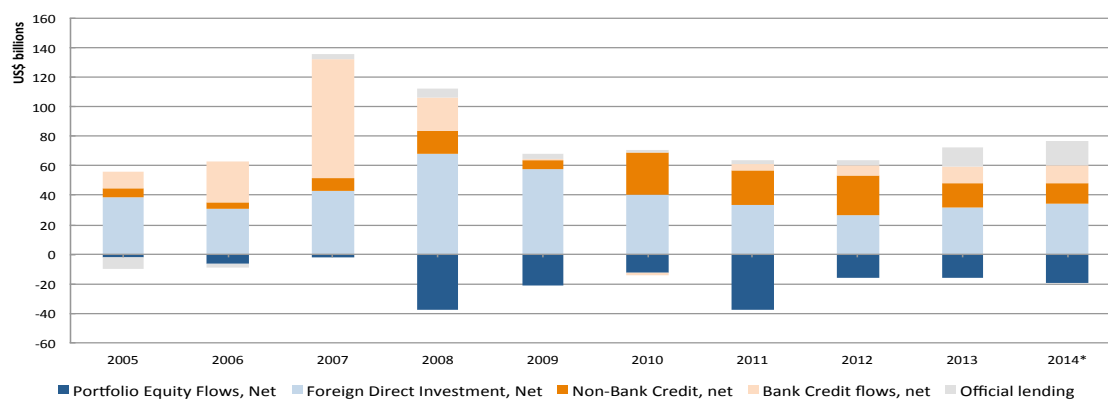
non-bank credit has been flowing strongly into the region, overtaking both bank credit and FDI, and reaching a projected \$100 billion in 2014 (compared to \$41 billion in 2008). Bank credit inflows have been declining between 2010 and 2013 but are projected to tick-up in 2014, reaching \$30 billion. Portfolio equity peaked in 2010 at \$35 billion but has since dropped to \$7 billion in 2014.

Bank credit inflows made up a majority proportion of inflows into emerging Europe before the crisis, reaching \$182 billion in 2007 (Figure 47). However, as the crisis took hold and banks began streamlining their lending practices and deleveraging, these flows reduced substantially – with negative inflows of \$65 billion in 2009. In 2014, bank credit inflows had picked up somewhat, projected to reach \$36 billion. Non-bank credit inflows have been growing steadily in the post-crisis period reaching a projected \$91 billion in 2014. Portfolio equity inflows have been small and volatile over the period analysed. In 2014, it is projected that inflows will reach \$7 billion in 2014.

Since 2005, capital flows to the Asia Pacific region have been dominated by FDI, which reached a projected \$135 billion in 2014. FDI flows have remained relatively steady over the period analysed. Bank credit flows initially declined after the onset of the crisis, with negative net inflows of \$58 billion in 2008. Between 2009 and 2011, bank credit flows increased, peaking at \$141 billion in 2011. By 2014, bank credit inflows had reduced projected to reach \$58 billion. Non-bank credit followed a similar trajectory as bank credit, and is projected to reach \$75 billion in 2014. Portfolio equity inflows have been positive and relatively stable since 2009, with the exception of 2011. In 2014, portfolio equity is projected to reach \$44 billion.

³³ FDI into MEA increased by 77% between 2005 and 2008, reaching \$68 billion in 2008.

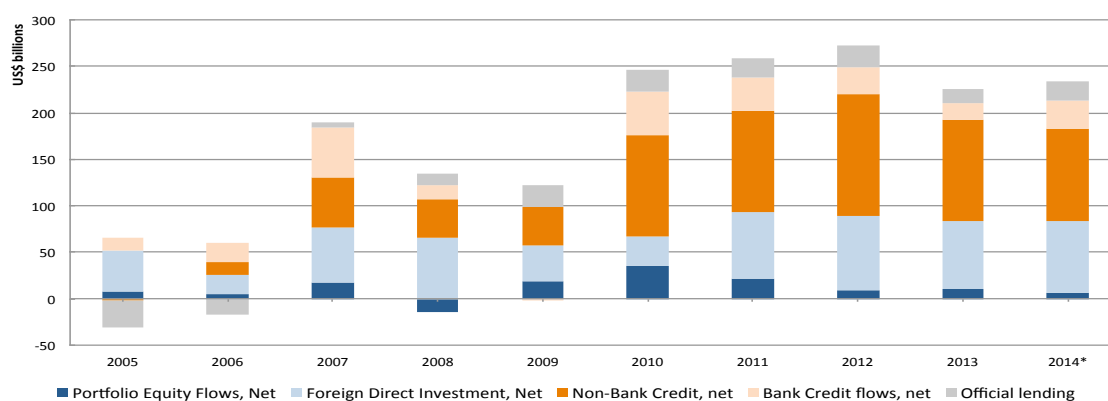
FIGURE 45: FLOW BREAKDOWN FOR EMERGING AFRICA AND MIDDLE EAST



Source: IIF, May 29 2014

Note: Total across sample countries. Emerging Africa and Middle East include Nigeria, Egypt, Morocco, South Africa, Lebanon, and Saudi Arabia.

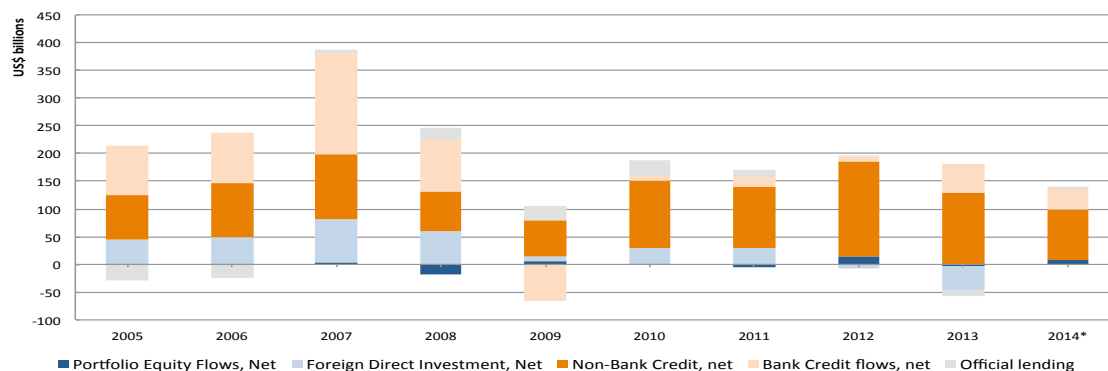
FIGURE 46: FLOW BREAKDOWN FOR EMERGING LATIN AMERICA



Source: IIF, May 29 2014

Note: Emerging Latin America include Argentina, Brazil, Chile, Columbia, Ecuador, Mexico, Peru, Venezuela

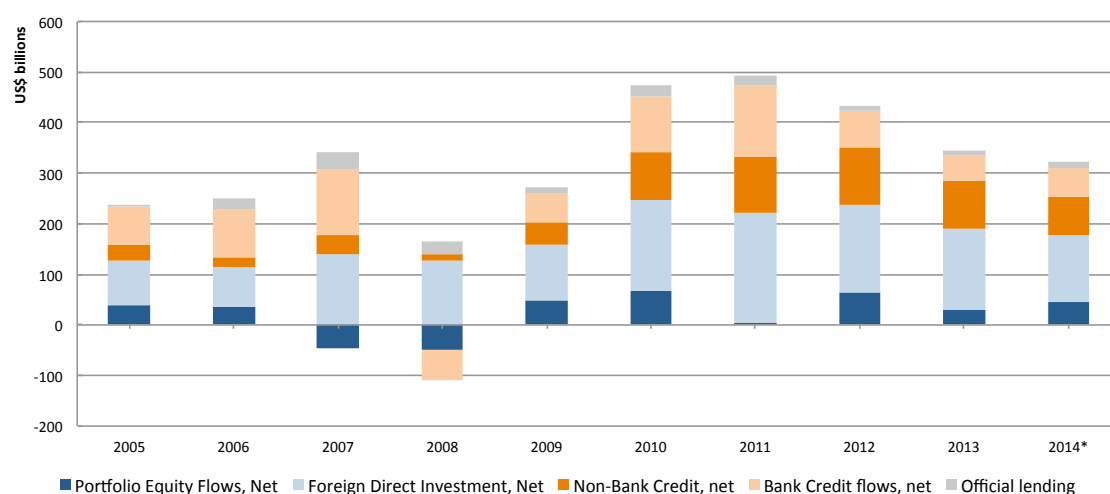
FIGURE 47: FLOW BREAKDOWN FOR EMERGING EUROPE



Source: IIF, May 29 2014

Note: Total across sample countries. Emerging Europe includes Bulgaria, Czech Republic, Hungary, Poland, Romania, Russia, Turkey, and Ukraine.

FIGURE 48: FLOW BREAKDOWN FOR EMERGING ASIA



Source: IIF, May 29 2014

Note: Total across sample countries. Emerging Asia includes China, India, Indonesia, Korea, Malaysia, Philippines, and Thailand.

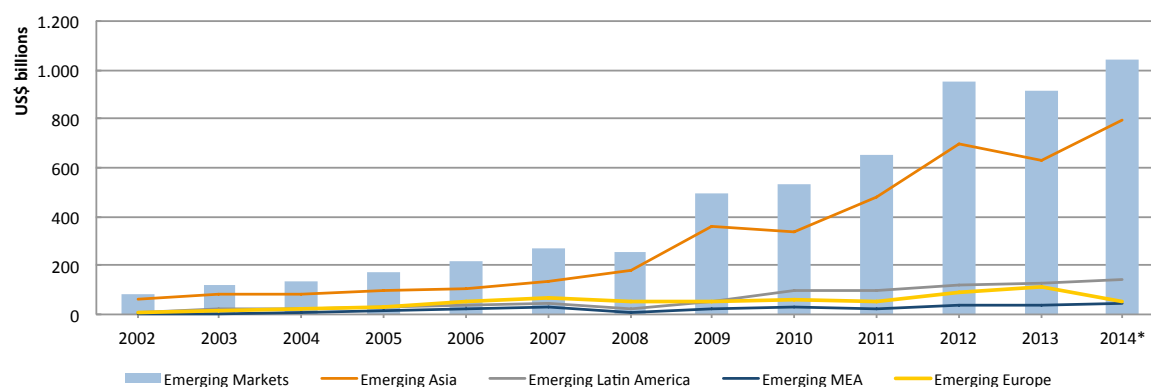
Strong corporate bond markets issuance...

Much of the increased securities markets activity in EMs is concentrated in debt markets. Figure 49 shows that across the emerging market regions, corporate bond issuance has soared and is projected to reach \$1 trillion in 2014 compared to just \$534 billion in 2010. The majority of this issuance is coming from emerging Asia (73% of issuances in 2014), although bond issuances from emerging Latin

America has also grown strongly over the last few years. In emerging Latin America, bond issuance volume is expected to reach \$146 billion in 2014 compared to \$124 billion in 2010.

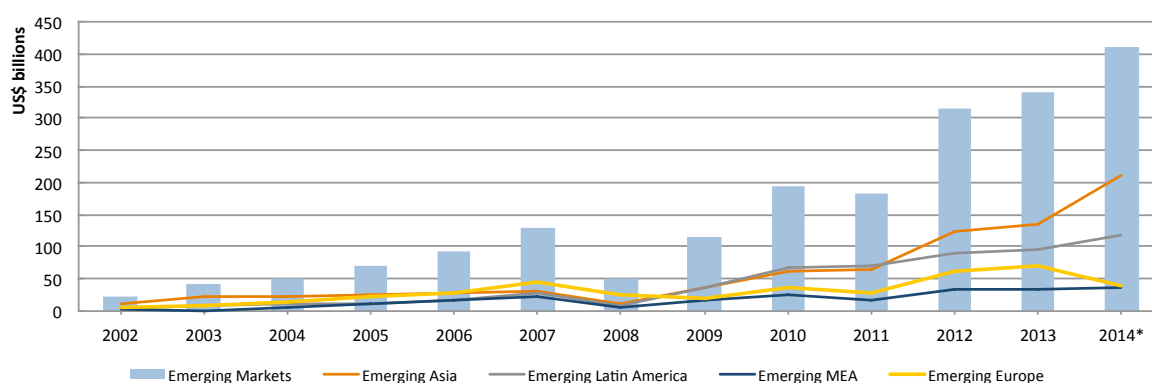
Corporate bonds from firms in EMs are also increasingly being issued on international markets, as Figure 50 indicates. In 2014, new issuances on international markets are expected to reach \$412 billion, compared to \$193 billion in 2010. Nevertheless, in 2014 more than 60% of new issuances were available only on domestic markets.

FIGURE 49: CORPORATE BOND ISSUANCE: EMERGING MARKETS



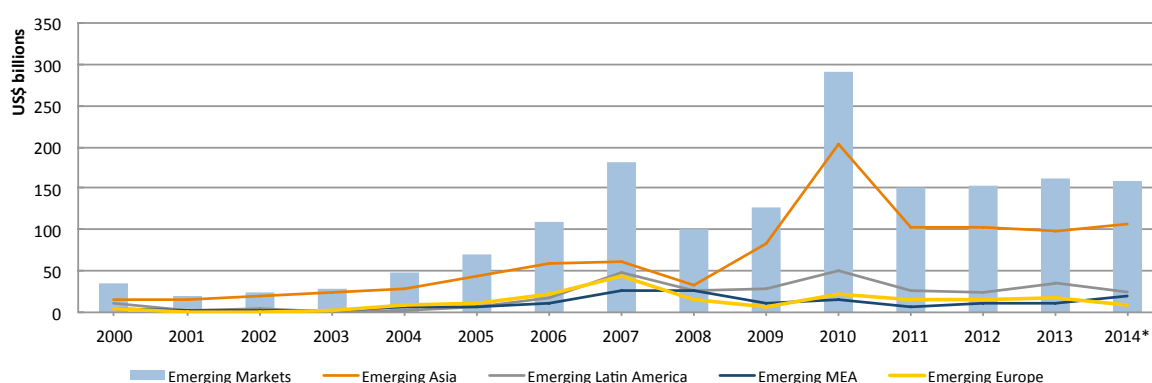
Source: Dealogic

FIGURE 50: CORPORATE BOND ISSUANCE: ISSUANCE ON INTERNATIONAL MARKETS



Source: Dealogic

FIGURE 51: ISPO VOLUME IN EMERGING MARKETS



Source: Dealogic

Note: Includes IPOs, Forward ons and Convertibles

...while relatively low but stable equity market activity...

Activity on EM equity markets has been more subdued – however, this sluggish performance most likely reflects a global downward trend in equity markets caused by the crisis rather than anything specific to EMs. For example, between 2007 and 2008, global equity market capitalisation dropped by 46%. In other words, in just one year, almost \$26 trillion worth of equity wealth was wiped out.³⁴

ISPOs volumes in EMs are projected to reach \$159 billion in 2014 (see Figure 51). In comparison, ISPO volumes in developed markets are expected to reach

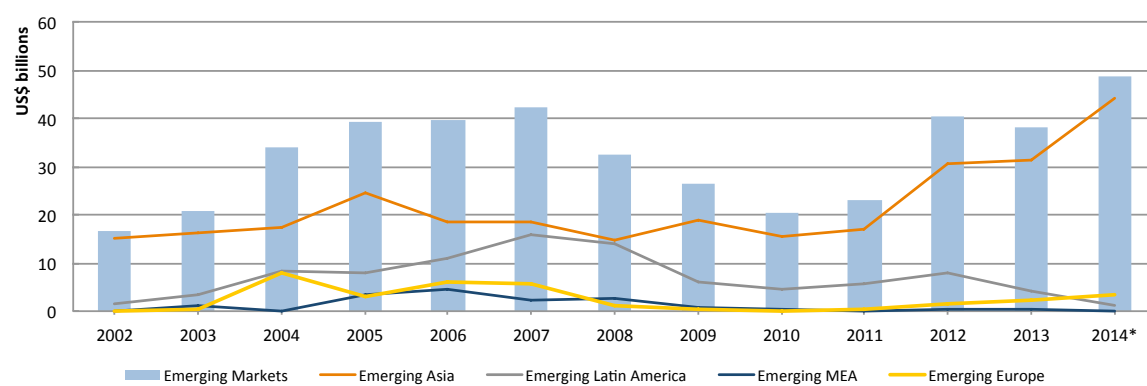
³⁴ Calculations based on World Bank data

\$860 billion the same year.³⁵ The greatest proportion of (projected) issuance in 2014 was from emerging Asia (\$107 billion). Emerging MEA issuance is expected to tick up in 2014, reaching (\$19 billion), while issuance from Emerging Europe (\$8 billion) and Emerging Latin America (\$25 billion) is expected to decrease compared to the preceding year.

A survey of financial industry participants conducted by PWC noted that emerging market exchanges are actively seeking foreign listings, including by firms based in other emerging markets. Interestingly, 75% of respondents to the survey pointed to China as the premier destination for new issuers by 2025, with India, Brazil and Russia also cited as emerging

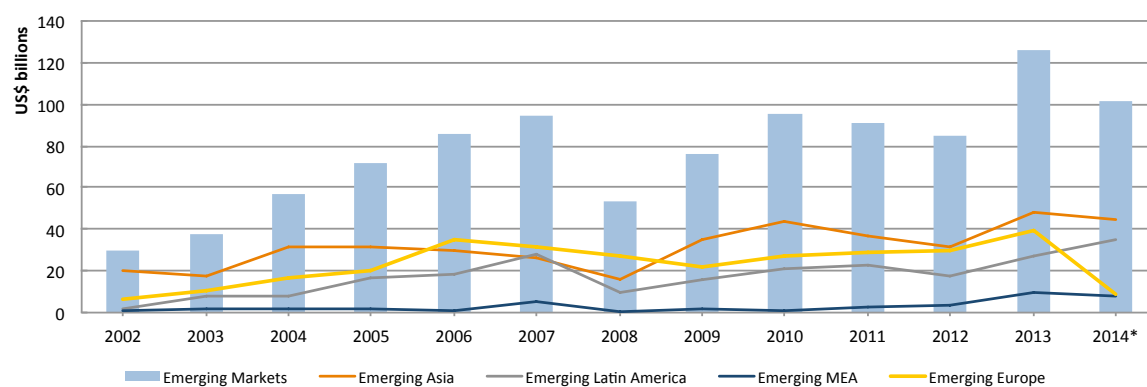
³⁵ Based on Dealogic data

FIGURE 52: SECURITISED PRODUCTS ISSUANCE (ABS + MBS) – EMERGING MARKETS



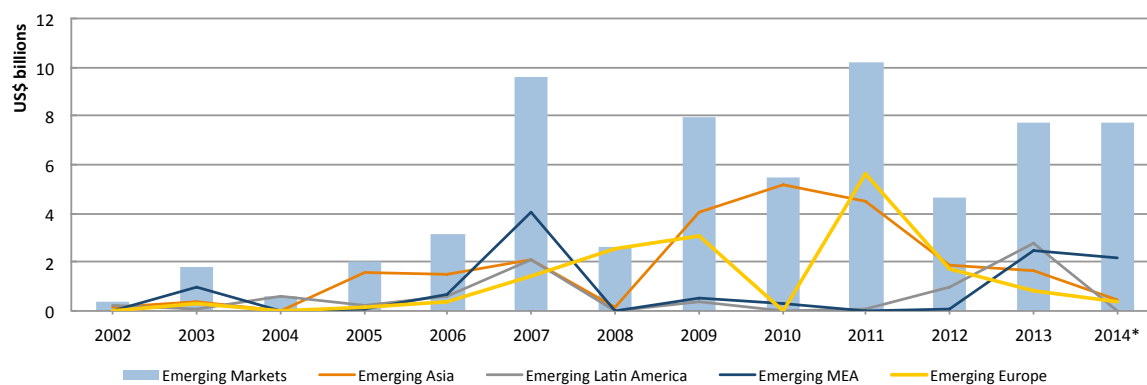
Source: Dealogic

FIGURE 53: HIGH YIELD BOND ISSUANCE IN EMERGING MARKETS



Source: Dealogic

FIGURE 54: LEVERAGED FINANCING THROUGH HY BOND MARKETS



Source: Dealogic

global players.³⁶ More recent data from the Baker & McKenzie Cross-Border IPO Index seems to confirm this trend: in 2013, cross-border equity IPOs raised \$32.5 billion globally – almost doubling the amount raised in 2012. A significant proportion of this equity was raised from emerging Asia.

...growing securitised products issuance in some emerging market regions show continuing sophistication and could imply more risk...

As inflows into EMs continue and securities markets become increasingly sophisticated, more complex products, some of which may involve higher risk, are gaining appeal. For example, the issuance of securitised debt products in some EMs has risen considerably in the last few years, with total EM issuance projected to reach \$49 billion in 2014 compared to \$20 billion in 2010 (see Figure 52). The majority of this issuance is coming from emerging Asia, while securitised product issuance in the other EM regions, such as Emerging Latin America, has been on a declining trend since the onset of the crisis.

...as could all-time high issuance of high yield bonds and some leveraged financing.

High yield bond issuance from emerging markets has been relatively steady since the onset of the crisis (despite an initial dip in 2008). In 2013, issuance surged to \$126 billion (compared to \$85 billion the previous year); however by 2014 issuance is projected to contract somewhat to \$102 billion (see Figure 53). This trend contrasts with the steady growth in high yield issuance in developed markets. The majority of this issuance in 2014 has come from Emerging Asia and Emerging Latin America. Issuance from Emerging Europe appears to have dropped significantly in 2014.

Leveraged financing through high yield bond markets in emerging markets has grown over the last decade or so, peaking in 2007 before the onset of the crisis (reaching almost \$10 billion) before momentarily shrinking in 2008 to just under \$3 trillion (see Figure 54). In 2014, leveraged financing

is projected to reach just under \$8 billion, boosted by a surge in leveraged financing from emerging MEA.

1.8. Vulnerabilities in real estate markets and real estate investment trusts

According to the global house price index (see Figure 55), real estate markets, many of which suffered an average drop in prices of 10% in 2008, have started to recover as prices stabilise. The IMF suggests that this recovery has brought real estate prices above their fundamental value, when compared with the growth of GDP.³⁷

Between 2007 and 2013, housing markets in many of the affected economies, including the US, Spain, Japan, Denmark, Ireland, Italy, the Netherlands and South Africa showed strong depreciation (see Figure 56). The aggregated fall in house prices was the strongest in Ireland (36%), Greece (-29%), Spain (-27%), Lithuania (-23%), Netherlands (-17%) and Slovakia (-14%). In contrast, other countries have shown strong growth in house prices over the same period. The strongest growth has been seen in Hong Kong (117%), Singapore (52%), Austria (45%) and Taiwan (40%). Also other countries that have been touched relatively mildly by the crisis, such as Australia, Israel, Norway, Canada, and New Zealand, show strong aggregate growth figures between 20% and 35%.

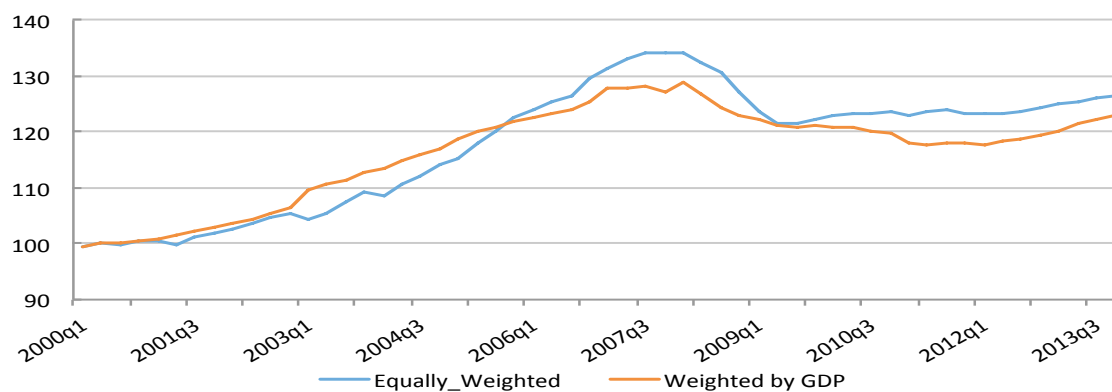
In various countries, authorities have raised concerns about the potential overheating of real estate prices and its possible impact on financial stability. Authorities in Hong Kong, Singapore and Canada have taken action to temper excessive growth of house prices with some apparent success. Figure 57 shows a sharp drop in growth in Hong Kong in 2011 and 2013 (although still high at 11% and 7%) and in Singapore after 2010. In some countries that were severely hit by the crisis, such as the UK, the US and Japan, growth in house prices picked up strongly in 2013, rising, respectively, 7%, 9% and 10%. In the UK, the Bank of England regularly voices its fears of the market overheating.³⁸

36 PWC, *Capital markets in 2025: The future of equity capital markets*, 2011

37 See: <http://www.imf.org/external/research/housing/>

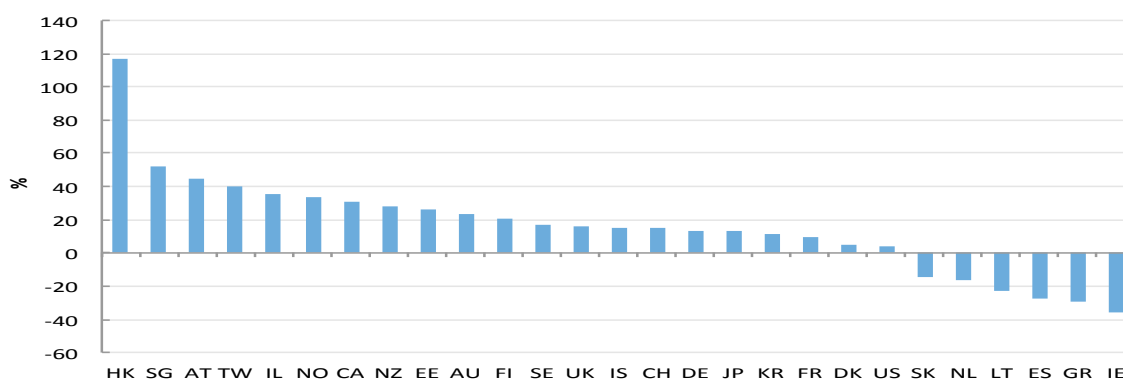
38 See: BBC, *Bank of England's Mark Carney warns on housing market*, 18 May 2014 <http://www.bbc.com/news/business-27459663>

FIGURE 55: GLOBAL HOUSE PRICE INDEX



Source: IOSCO Research Department based on IMF data

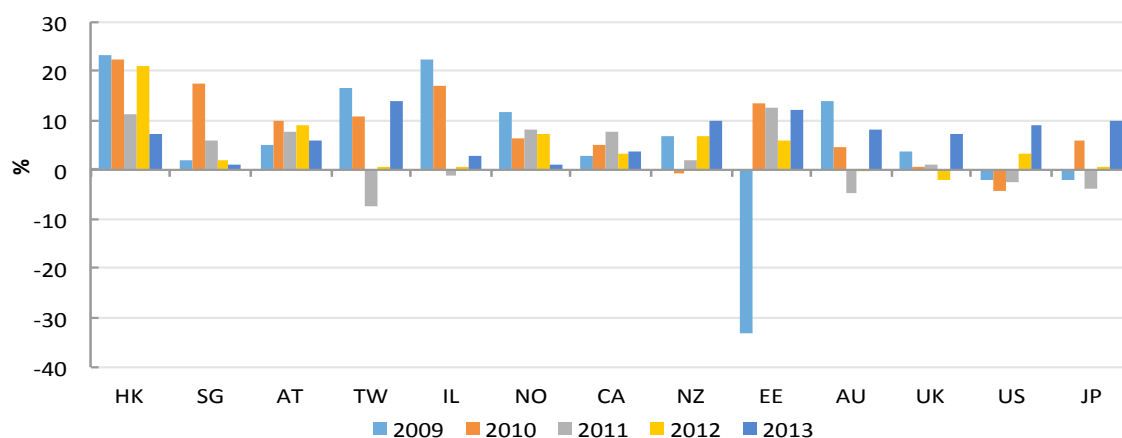
FIGURE 56: DEVELOPED COUNTRIES: AGGREGATE GROWTH POST CRISIS IN THE HOUSING MARKET



Source: IOSCO Research Department based on Global Property Guide

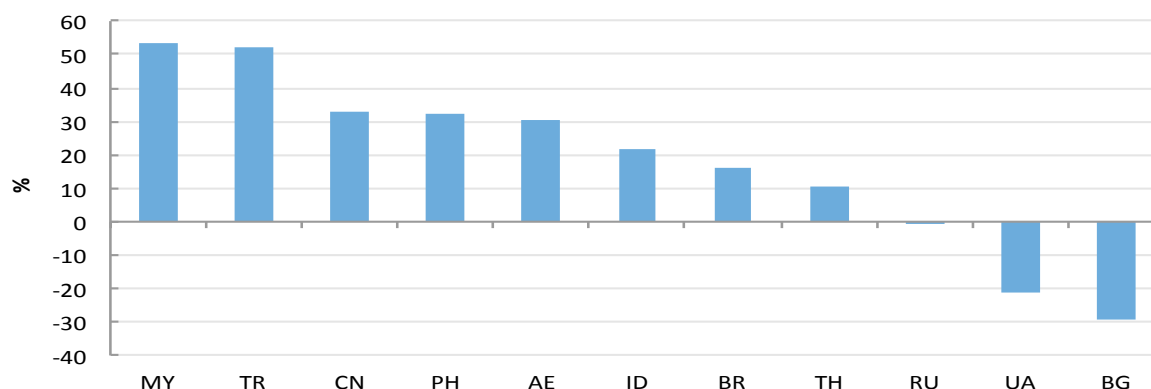
List of abbreviations: HK : Hong Kong, SG : Singapore, AT : Austria, TW : Taiwan, IL : Israel, NO : Norway, CA : Canada, NZ : New Zealand, EE : Estonia, AU : Australia, FI : Finland, SE : Sweden, UK : United Kingdom, IS : Iceland, CH : Switzerland, DE : Germany, JP : Japan, KR : South Korea, FR : France, DK : Denmark, US : United States, SK : Slovak Republic, NL : Netherlands, LT : Lithuania, ES : Spain, GR : Greece, IE : Ireland,

FIGURE 57: ADVANCED MARKETS: ANNUAL GROWTH POST CRISIS IN THE HOUSING MARKET



Source: Global Property Guide and Calculations of IOSCO Research Department

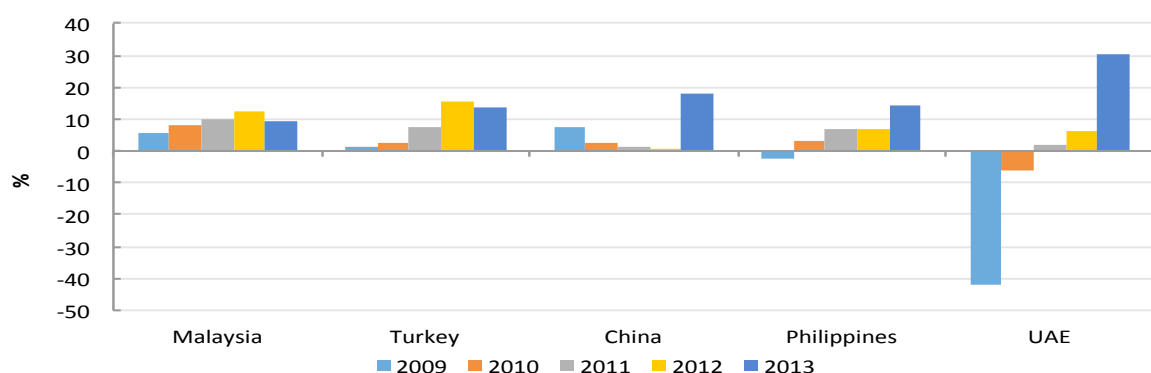
FIGURE 58: EMERGING MARKETS - AGGREGATE GROWTH POST CRISIS IN THE HOUSING MARKET



Source: Global Property Guide and Calculations of IOSCO Research Department

Note: Fipe (Brazil), Napiç (Malaysia). List of abbreviations: MY : Malaysia, TR : Turkey, CN : China, PH : Philippines, AE : United Arab Emirates, ID : Indonesia, BR : Brazil, TH : Thailand, RU : Russia, UA : Ukraine, BG : Bulgaria

FIGURE 59: EMERGING MARKETS - ANNUAL GROWTH POST CRISIS IN THE HOUSING MARKET



Source: Global Property Guide and Calculations of IOSCO Research Department

In emerging markets various countries show high growth in house prices (see Figure 58 and 59). Malaysia and Turkey lead with aggregated growth figures of more than 50% during the last five years, followed by China, the Philippines and United Arab Emirates, all of whom show growth in house prices of more than 30%. This growth is partly fuelled by catch-up demand from the expanding middle classes in these countries. In some cases, capital inflows, driven by the search for yield, have also pushed up housing prices in these countries above fundamental values. The risk is that a hike in interest rates (see Part II, Chapter 1) could potentially send house prices lower, triggering an outflow of capital (see Part II, Chapter 2) and hurting the economy of these countries. (Housing markets in Romania, Ukraine and Bulgaria show negative aggregated growth,

which is attributable to the negative economic growth of the past years.

Growth in the Malaysian housing market has been steady, with a slight decline in 2013. The housing markets in the UAE, China and Philippines exhibited a spike in growth last year. For example, the UAE, whose real estate market was severely affected by the crisis, experienced 30% growth during the last year.

China's housing market, which grew more than 17% in the past year, has been pointed out as a concern by some commentators. Overheating and a potential correction of housing prices could affect the Chinese economy, and hurt global economic growth (*See Part II, Chapter 2*).³⁹

³⁹ See e.g. I. Shim, B. Bogdanova, J. Shek and A. Subelyte, Database for policy actions on housing markets, *BIS Quarterly Review*, September 2013, and Blackrock Investment Institute, *Braking China ...Without Breaking the World*, April 2012

Real Estate Investment Trusts

With interest rates near historical lows due to accommodative monetary policies, investors are increasingly attracted to REITs in their search for higher yields (see Figure 60). Despite the financial crisis, global market capitalisation of listed REITs grew approximately 140% from about \$400 billion in 2008 to almost \$1 trillion in 2012. As of September 2013, the market capitalisation of global REITs has exceeded \$1 trillion.⁴⁰

Particularly in Asia, the REIT market has grown substantially, both in terms of the number of listed REITs and market capitalisation. Rapid commercialisation and urbanisation underpinned by the economic expansion in Asia's emerging economies have fuelled the demand for various properties such as hotels, hospitals, shopping malls, offices and industrial buildings. Favourable legislative structures have also contributed to the growth of the Asian REIT market.

While REITs resemble an equity investment, they tend to employ varying amounts of leverage obtained through bank debt or the corporate bond market. In December 2013, the Fed announced the beginning of the tapering of its quantitative easing program, which could lead to rising interest rates. One implication for REITs would be a higher cost of borrowing. This would cut into the return and dividend potential of REITs. Increasing interest rates would also potentially result in a downward revision of property values, causing a capital loss for REITs.

In addition, REITs which are largely dependent on short/medium term funding agreements or mortgage terms subject to renewal at then-current interest rates, and are reliant on leveraging, may struggle to refinance their debts. In a severe downturn, declining rental yields and prices can push the loan-to-value ratios to levels where private sector refinancing is no longer viable. As a result of the REIT's leveraged structure and exposure to highly illiquid and cyclical real estate financial regulators worldwide in recent years have focused their attention on potential systemic risks posed by

REITs.⁴¹ Such risks could be accentuated in certain structured REITs, e.g. mortgage REITs (mREITs).

Unlike the more prevalent equity REITs, which typically own and operate income-generating real estate, mREITs provide financing for real estate by purchasing or originating residential and/or commercial mortgages, as well as mortgage-backed securities (MBS), and earn income from the interest on these investments.

mREITs typically make money for their investors by obtaining low-cost short-term financing in the repo market and holding long-term assets that yield higher interest rates such as MBS. To enhance returns, mREITs tend to use more leverage than equity REITs, which reduces their ability to absorb unexpected shocks from events such as a spike in interest rates. As of 30 June 2013, the two largest mREITs by asset size, Annaly Capital Management and American Capital Agency, reported debt-to-equity ratios of 6.2 to 1 and 7.1 to 1,⁴² respectively. In contrast, the debt-to-equity ratio of equity REITs is typically only 1 to 1.5 times.

These investment vehicles have grown significantly in recent years. There are more than 40 mREITs today, with total assets held exceeding \$450 billion. The rapid growth of mREITs over the past three years has caught the attention of the regulators, some of whom are increasingly concerned about mREITs' exposure to interest-rate spikes, high reliance on leverage and short-term financing that could dry up in a crisis.

Despite the recent growth of mREITs, they represent a modest part of the mortgage market. mREITs hold less than 5% of the \$6 trillion agency MBS market in the US, compared with 22% by banks and other depository institutions, 20% by the Federal Reserve and 11% by mutual funds (see Figure 61).⁴³

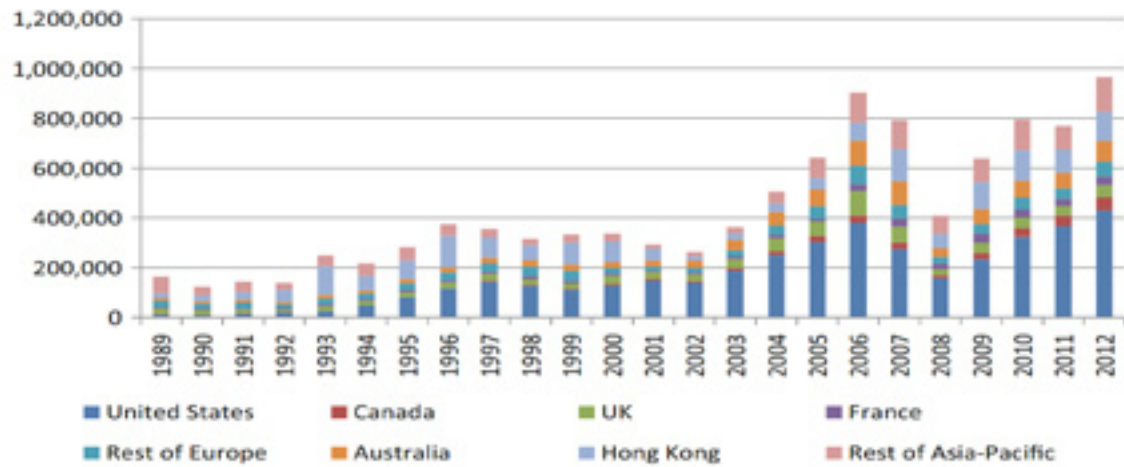
41 FSB, *Global Shadow Banking Monitoring Report 2013*, November 2013

42 Annaly Capital Management Inc. Form 10-Q for the quarter ending June 30, 2013, p. 46, and American Capital Agency Corp. Form 10-Q for the quarter ending June 30, 2013, p. 38.
<http://investor.annaly.com/Cache/18845640.pdf?IID=113558&FID=18845640&O=3&OSID=9> <http://ir.agnc.com/phoenix.zhtml?c=219916&p=irol-SECText&TEXT=aHR0cDovL2F-waS50ZW5rd2l6YXJkLmNvbS9maWxpbmcueG1sP2lwYWdlPTk-wNjksNjImRENFUT0xJlNEUT0zOSZTUURFU0M9U0VD-VEIPTl9QUdFmV4cD0mc3Vic2lkPTU3>

43 2014 NAREIT Brief: Agency Mortgage REITs And Financial Stability

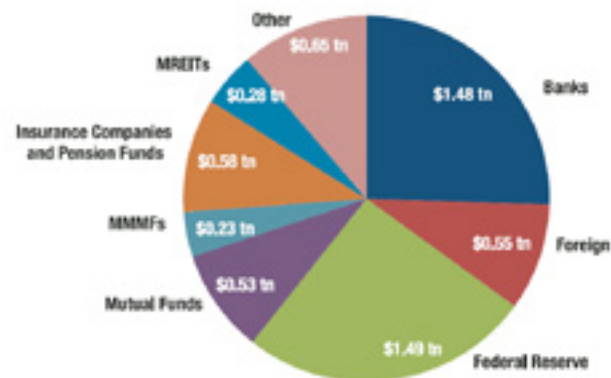
40 EY *Global perspectives: 2013 REIT report*.

FIGURE 60: GLOBAL MARKET CAPITALISATION OF LISTED REITS (US\$M)



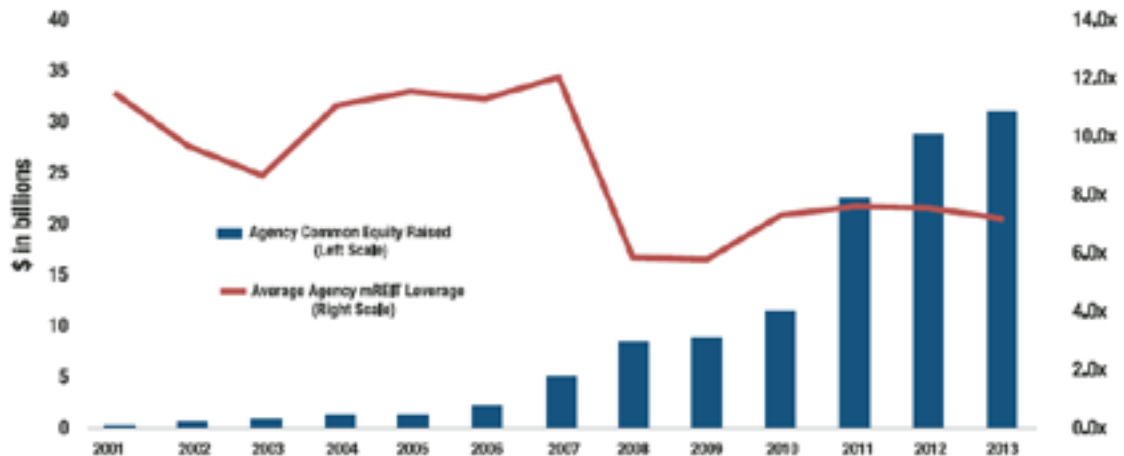
Source: The Global Real Estate Investment Trust Market: Development and Growth, by Simon Stevenson

FIGURE 61: INVESTORS IN THE AGENCY MBS MARKET IN THE US



Source: Federal Reserve Board, Financial Accounts of the United States

FIGURE 62: LEVERAGE AND CAPITAL OF MREITS



Source: Dealogic, FactSet and Company filings

In the past few years, mREITs have taken steps to reduce leverage and raise capital to better withstand any unanticipated financial stress (see Figure 62). Other measures implemented to combat the interest rate risk include making longer-term financing arrangements and using derivatives contracts and other hedging strategies.

While REITs are susceptible to interest rate risk and economic cycles, it is less clear if the REITs market, based on current trends and developments, poses a threat to the stability of the broader financial system. Globally, most REITs are regulated listed entities and they are required to meet certain standards of corporate governance and financial requirements, among others. In some jurisdictions, such as Singapore, REITs are subject to leverage limits and restrictions on the type of permissible investments. In others such as Canada and the United States there are no leverage limits imposed by regulation, but in practice, REITs have maintained a leverage ratio in the range of 30-60 per cent (debt/assets).⁴⁴ Besides having these safeguards in place, many REITs have taken steps to mitigate the impact of an interest rate spike or economic downturn. Some initiatives observed in the REIT industry include issuing longer-term debt to diversify debt maturity and opting for fixed rates over floating rates for financing.

1.9. Global macro-economic policy is impacting securities markets

Central bank balance sheets and tapering are impacting markets globally...

The stance of monetary policy remained highly accommodative in the US, Japan and the euro area throughout 2013. Central bank policy rates remained at levels close to zero in a context characterised by the absence of inflationary pressures and weak economic activity (see Figure 63, right-hand panel). The implementation of expansionary monetary policies since the beginning of the crisis, with

a remarkable component of non-conventional measures, has resulted in important changes in the composition of the central banks' balance sheets, which have increased significantly in size. Figure 63, left-hand panel shows the size relative to GDP.

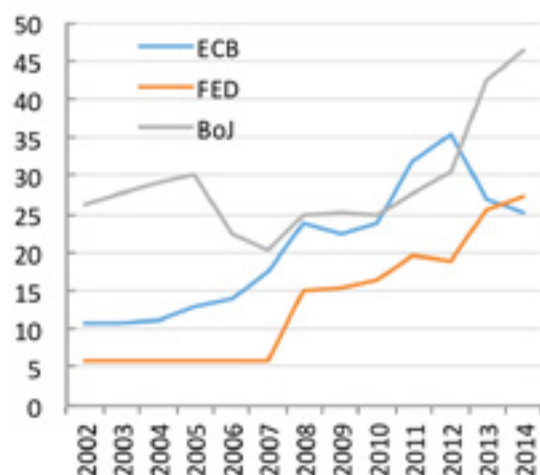
In the euro area, the volume of assets of the central bank increased from less than 15% of GDP before the crisis to a peak of 35% of GDP in 2012, before decreasing to 25% of GDP by mid-2014. In the US, the balance sheet of the Fed, increased from 6% of GDP in 2007 to 27% of GDP by mid-2014, and is still expanding. In Japan, on April 2013, the central bank announced the details of the Quantitative and Qualitative Easing (QQE), one of the three pillars of the government's new growth strategy. Under the QQE, the inflation target of 2% by 2015 was reaffirmed and for that purpose, the central bank agreed to double the monetary base by the end of 2014, with an annual increase of JPY 60-70 trillion. As a consequence of this decision, the size of the balance sheet of BoJ increased from 30% of GDP in 2012 to 46% of GDP by mid-2014.

In spite of the accommodative stance of monetary policy in most developed economies, some of the non-conventional programs have been terminated or are being reduced. In the case of the euro area, the size of the Eurosystem's balance sheet has declined gradually from its peak in mid-2012, due to improving market funding conditions. The outstanding volume of refinancing operations has declined thanks to the banks' early repayments of funds obtained through the long-term (three-year) refinancing operations (LTRO) conducted in December 2011 and February 2012 (an amount of €1 trillion was allotted). Nearly 47% of the liquidity provided in these operations has been repaid, originating a decrease in the outstanding volume of long term financing from €1.1 trillion in February 2012 to €513 billion in May 2014 (see Figure 64, left-hand panel). Another significant proportion of the assets in the Eurosystem's balance sheet are related to asset purchase programmes for monetary policy purposes. Specifically, these assets have been acquired under two covered bond purchase programmes and the Securities Market Programme; they will be held until maturity.

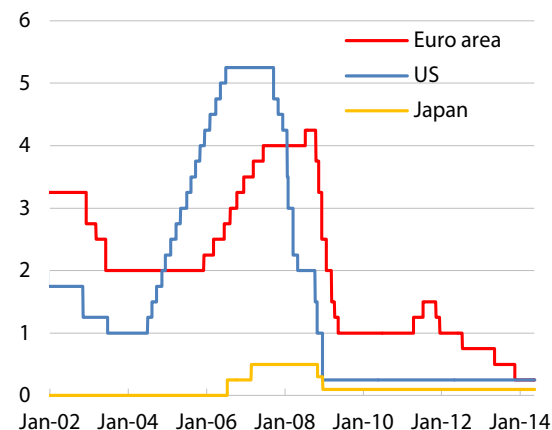
⁴⁴ For instance, the debt ratio of the FTSE NAREIT ALL REITs Index at the end of 2013 was 49.2%, while the FTSE NAREIT ALL Equity REITs Index's debt ratio at the end of 2013 was 34.1%. The debt ratios of both indices are near their historical lows. (Ref: NAREIT2013 REIT Market Summary.)

FIGURE 63: CENTRAL BANKS: BALANCE SHEETS AND INTEREST RATES

Balance sheet1 (% GDP)



Official interest rate (%)



Source: Bloomberg and Thomson Datastream.

Note: Data up to May 2014.

Fed's collateral position is still growing by its reverse repo program...

In the US, the Federal Open Market Committee (FOMC) of the Board of Governors of the Federal Reserve System maintained through most of 2013 the existing pace of asset purchases, i.e., agency mortgage-backed securities and long term Treasury securities, at a pace of \$40 billion and \$45 billion each month, respectively. The level of unemployment, well above its longer-run normal level, and inflation below the 2% target were the main reasons argued by the FOMC for the preservation in the volume of purchases. However, given the cumulative progress in its objectives for the economy, the FOMC agreed to reduce the pace of its assets purchases at the end of the year. In December 2013, the FOMC concluded that the improvement in the labour market conditions were meaningful and likely to be sustained and anticipated that inflation would move back towards 2% as the economy strengthened. The volume of agency MBS and long-term Treasury purchases was reduced to \$35 billion and \$40 billion per month, respectively.

The FOMC decided to maintain the pace of reduction in the volume of purchases of securities

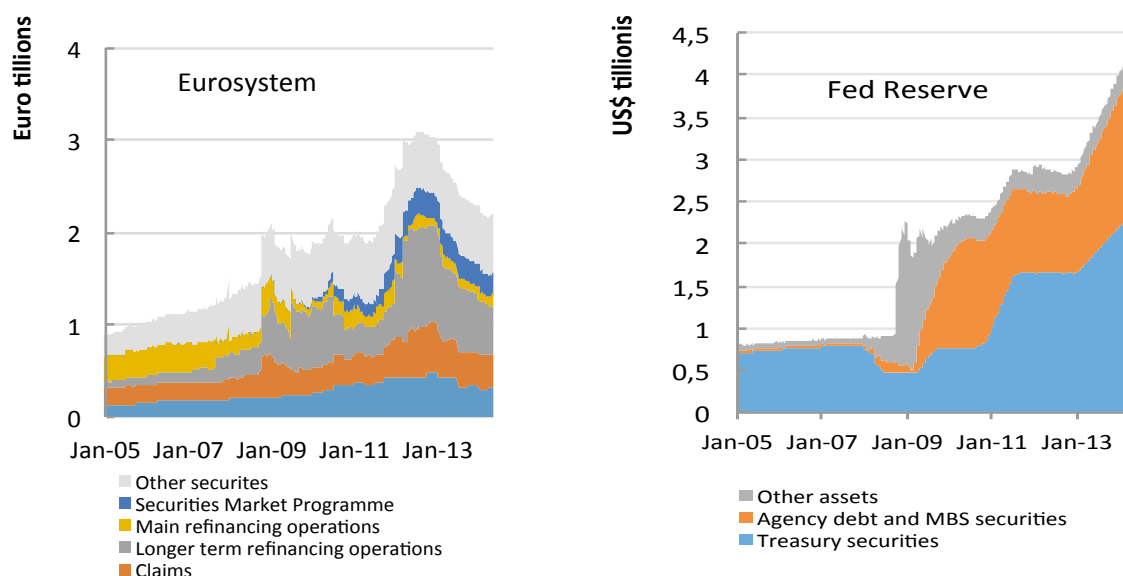
during the meetings of January 2014, March 2014 and April 2014; the current pace of monthly purchases amounts to \$45 billion (\$20 billion for MBS and \$25 billion for Treasuries). As a consequence of these monetary policy decisions, the size of the balance sheet of the Federal Reserve continued to increase, although at a slower pace (see Figure 64, right hand panel).

Risks of monetary policy misalignment...

Recent macroeconomic data suggest that the reasons for currently-aligned jurisdictions to follow different monetary policies are growing. US inflation is expected to return to levels close to 2%, and the UK seems to be diverging from other EU countries, the risk of deflation remains, particularly in the Eurozone, where several countries have been registering below zero year-on-year CPI rates for months.

If these changes in the rate of inflation materialise simultaneously, central banks may have stronger incentives to pursue domestic monetary policy goals and diverge from the more coordinated monetary policy of the last several years. This misalignment could result in significant adjustments in exchange rates. Moreover, in some developed economies,

FIGURE 64: BALANCE SHEET - EUROSISTEM AND FEDERAL RESERVE



Source: Bloomberg.

Note: Claims include those on non-euro area residents in euro and foreign currency and claims on euro-area residents in foreign currency.

there are budgetary constraints that impact the use of fiscal policy and in certain economic conditions (e.g. under low inflation or deflationary environment and already null or negative reference interest rates) the effects of monetary policy have already been exhausted.

The room to accommodate or minimise undesired impacts of diverging monetary policy agendas in integrated markets could lead to a significant economic and market destabilisation. Stimulus programs may be insufficient for economic growth and job creation, especially in Europe, thus raising questions regarding the performance of financial markets vis-à-vis the performance of the real economy.

PART 2

POTENTIAL SOURCES OF SYSTEMIC RISK

Chapter 1: The Search for Yield and the Return of Leverage in the Financial System

Last year's Outlook outlined how expansionary monetary policies have driven interest rates down to historically low (and sometimes negative) levels in real terms. It noted that *"while these policies support the functioning of the global financial system and potentially stimulate the real economy, spillover effects may create potential risks for securities markets."*

This "search-for-yield" environment⁴⁵ has pushed investors into higher yielding (and therefore riskier) products and heralded the increase of leverage to the system. This Chapter updates last year's analysis, underlining trends in specific higher yielding products, credit terms and leveraged financing.

Background

In the wake of the global financial crisis, perceived instability and the failure of a number of large financial institutions hurt investor confidence. Stock indexes were hit, as was investor sentiment (with bearish sentiment increasing and bullish sentiment decreasing) (see Figure 65).

Government spending policies and accommodative central bank monetary policies were implemented, in an effort to stimulate economic and financial growth and mitigate systemic risk. For example, governments in developed markets chose to bail-out a number of failing financial institutions, in a bid to limit the systemic impact on the economy. However, governments were forced to issue more government

debt (government bonds) to finance these pending policies.

An excess of government debt can push up yields and crowd out financing opportunities for corporates. Consequently, central banks⁴⁶ initiated asset purchasing programs to absorb a percentage of government debt issuances and keep interest rates low, thus encouraging risk-taking.⁴⁷ For example, quantitative easing was employed in the United States to purchase private financial assets [in the market], in order to lower the yield on similar assets and encourage long-term investment.⁴⁸ These programs also allow central banks to reduce duration⁴⁹ from the market by purchasing long-term securities, thereby lowering long-term interest rates.⁵⁰

Government spending policies and central banks' accommodative monetary policies helped boost investor confidence and encourage more bullish investor sentiment. The S&P index has soared since it hit a ten-year low in mid-2009, to well above the pre-crisis high, in the first half of 2014 (see Figure 65).

46 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.

47 "Search for yield as rates drop further", *BIS Quarterly Review*, September 2012

48 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

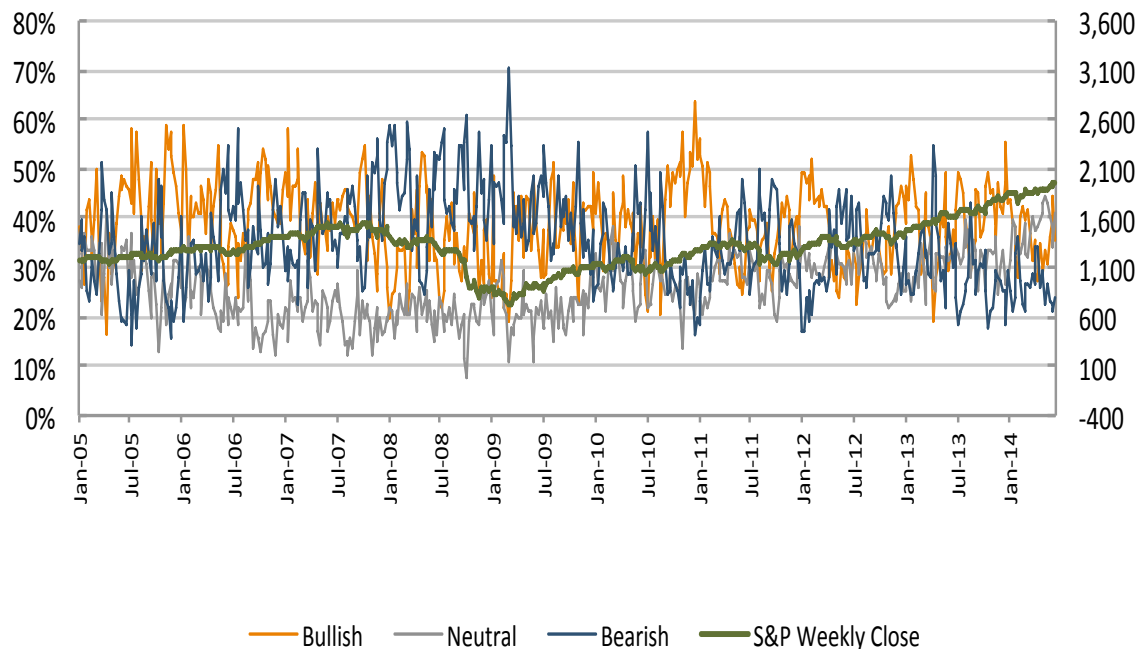
49 Duration refers to the sensitivity of the price of a bond to changes in interest rates. The longer the duration of a bond, the more exposed the bond is to changing interest rate conditions and thus volatile prices. Longer duration bonds offer higher yields to compensate investors. By purchasing longer-term securities, central banks can reduce the supply of longer-term securities, compared to the demand. Consequently, issuing firms do not have to compete by offering higher yields to investors.

50 "Search for yield as rates drop further", *BIS Quarterly Review*, September 2012

45 The Bank of England has an in-depth analysis the drivers of the search for yield in Box 1 of its *Financial Stability Report*, June 2013

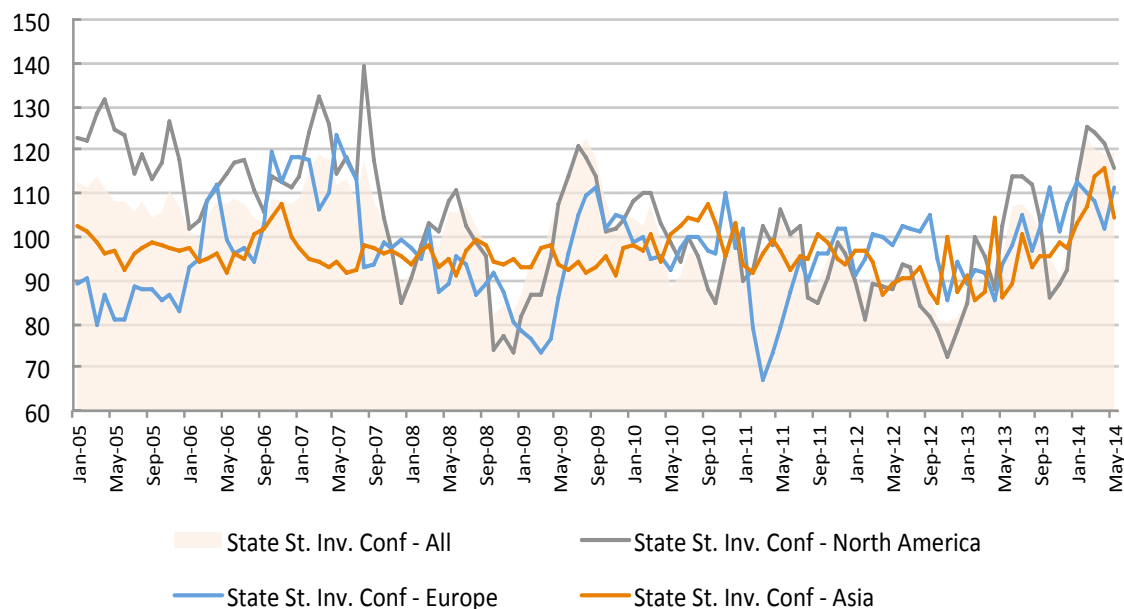
FIGURE 65: INVESTOR SENTIMENT AND CONFIDENCE

Investor Sentiment Index



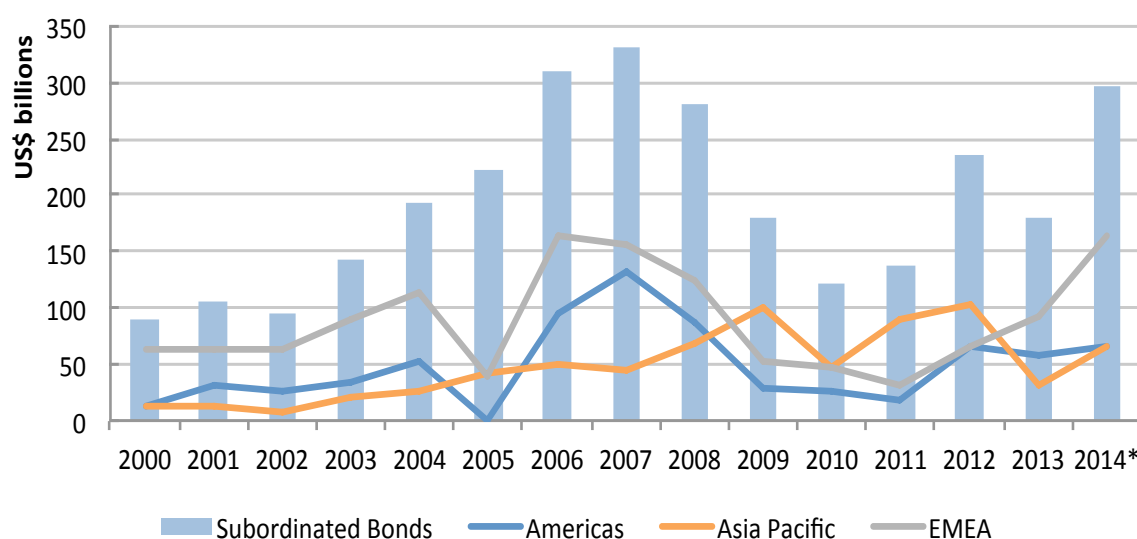
Source: AAIA

State Street Investor Confidence Index



Source: Bloomberg; State Street

FIGURE 66: SUBORDINATED BONDS ISSUANCE



Source: Dealogic

However, nominal interest rates have neared zero and have sometimes been negative in some developed markets. For example, in an unprecedented move, the ECB recently announced the first known negative deposit facility interest rate.⁵¹ The consequence of this is a compression of term and risk premium,⁵² along with affecting the price of other interest-based assets priced off the benchmark rate.

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.⁵³ This environment has spurred a search for yield. Over the last few years, high yielding products have undergone a resurgence. *Section 1* reveals how high yielding bonds and Contingent Capital (CoCos) have increased. High yield bond issuances in general have increased sharply, reaching a projected \$617 billion

in 2014, compared to a low of \$110 billion in 2008. Other platforms for high yield products, such as crowd-funding, are also on a steep growth curve.⁵⁴

Subordinated bond issuance⁵⁵ dropped in the aftermath of the crisis to \$125 billion in 2010, from a “pre”-crisis high of \$332 billion in 2007. By 2014, however, issuance of these products had picked up and is projected to be just over \$297 billion (see Figure 66).

The sharp increase in covenant-lite bond issuance is also a testament to the search for yield environment, with investors willing to accept decreased credit protections in exchange for higher yield.⁵⁶ Covenant-lite bonds are bonds with more relaxed restrictions on collateral, payment terms and other contractual obligations. Despite issuances of covenant-lite bonds dropping off in 2008, by 2014, covenant-lite issuance

51 European Central Bank (June 2014): “ECB introduces a negative deposit facility interest rate” [http://www.ecb.europa.eu/press/pr/date/2014/html/pr140605_3.en.html]

52 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

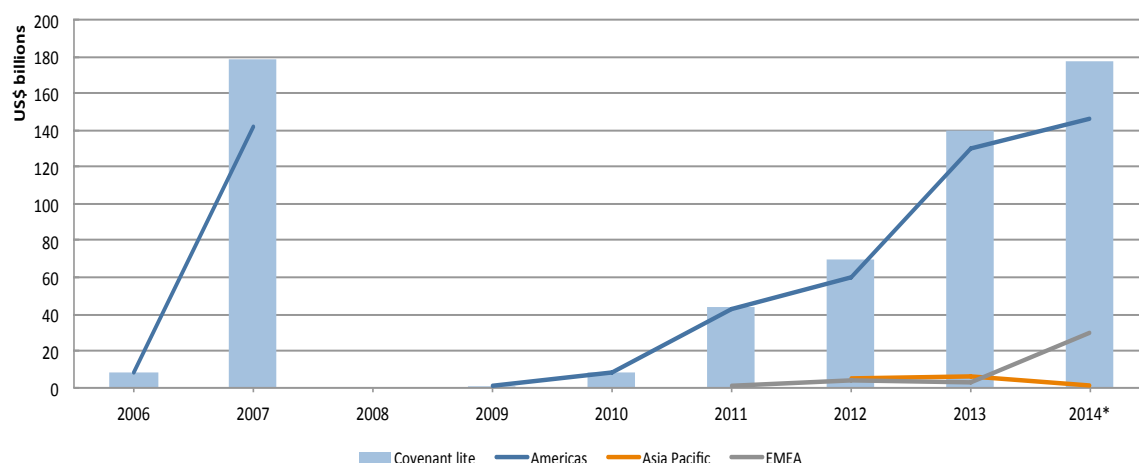
53 See “Search for yield as rates drop further”, *BIS Quarterly Review*, September 2012

54 Crowd-funding and peer-to-lending provides investors with above average yields – around 10-12%. See Shane Worner, Eleanor Kirby “Crowdfunding: An infant industry growing fast”, *IOSCO Research Department Staff Working Paper* 2014

55 Subordinated bonds are bonds that, in the case of default, rank below other forms of debt in terms of pay-out. This makes them more risky than other forms of bonds.

56 In a recent report by credit rating agency Moody’s, the default rate on US Corporate issued covenantlite loans was comparable to other non-investment grade bonds issuances. (See “Time is catching up with covenant-lite” *Moody’s Research*, June 2014)

FIGURE 67: COVENANT-LITE ISSUANCE



Source: Dealogic

is projected to reach \$177 billion, comparable to the peak of \$179 billion in 2007 (see Figure 67). Issuance comes mainly from the Americas, although in 2014, issuance from EMEA picked up and is projected to reach \$30 billion, compared with \$3 billion in 2013.

Payment-in-kind (or PIK) bonds refer to bonds where the return on the bond is paid out in the form of additional bonds or other securities. Essentially, the issuer of the original bond, issues more debt which is then passed on as payment to the initial investors. In this way, the interest payment is effectively deferred. In general, PIK bonds are considered high-risk and are used by companies during periods of distress. They are usually sought after by sophisticated, institutional investors (e.g. hedge funds) rather than investors looking for a stable cash flow. The issuance of PIKs peaked in 2007, reaching around \$11 billion. Most of this issuance came from the Americas. While PIK issuance was fairly subdued following the onset of the crisis, PIK issuance peaked again in 2013, well above 2007 levels, reaching over \$18 billion. Issuance was strong in both the Americas and EMEA. In 2014, issuance is expected to have reduced somewhat, but still above 2007 levels, reaching over \$15 billion.

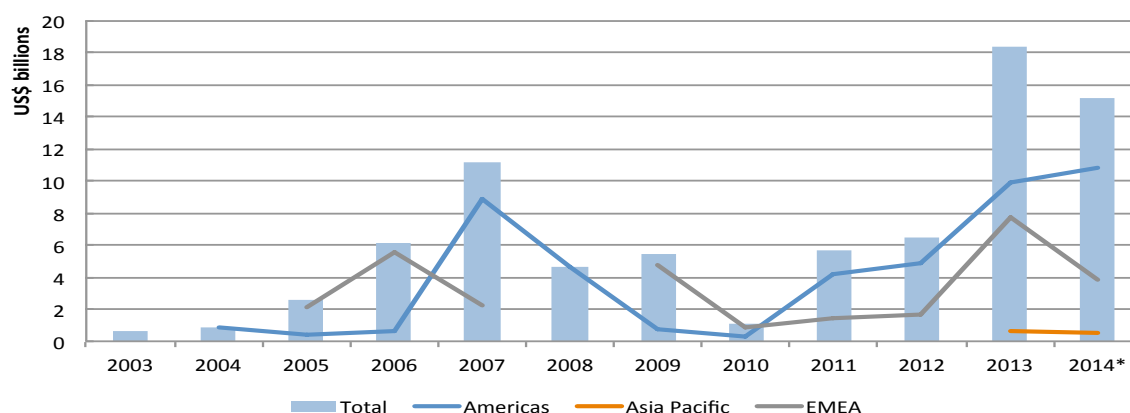
Such behaviour on the part of investors could be considered a positive development as this capital

allows firms to continue operation and new firms to enter the market, spurring economic recovery; a direct result of the accommodative policies. On the other hand, a search for yield can also push investors into unsustainable investments while at the same time the cost of borrowing becomes a lesser concern for firms. Inefficient investments can in turn impede/ lower the long-term growth rates. As central banks begin tightening monetary policy, and interest rates increase to “normal” levels, the same forces pushing liquidity into the market and facilitating increasing investment are anticipated to diminish.

In fact, in the second half of last year, the US Federal Reserve announced its plan to reduce its bond purchasing program in the near-term, causing a bond fund sell-off and outflows from EMEs.⁵⁷ During this period, the yield on 10 year US Treasury bills increased supply. By December 2013 tapering began, but the 10 year T-Bill yield actually trended downward reaching 2.6% in June 2014 compared to 3.1% at the beginning of the year (see Figure 69).

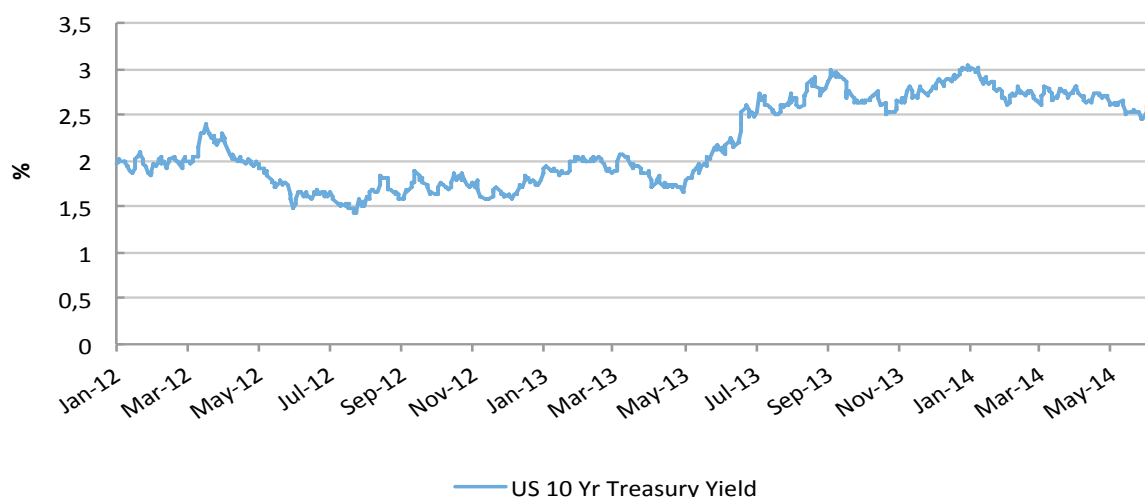
⁵⁷ See EPRF data cited in Jerome Powell, *Speech at the Federal Reserve Bank of San Francisco 2013*, Asia Economic Policy Conference, San Francisco, 4 November 2013.

FIGURE 68: PAYMENT-IN-KIND BONDS ISSUANCE



Source: Dealogic

FIGURE 69: YIELD ON US 10-YR T-BILLS



Source: Bloomberg

The decline in yield through 2014 may reflect the market's realisation that the US Federal Reserve was unlikely to raise interest rates immediately. Markets largely absorbed the shock of this tapering, since it would seem that monetary policy would remain accommodative for longer than first feared and therefore the accommodative cycle had a little longer to run. In 2014, high yield issuances and leveraged investing continued on pace.

Understanding the risks

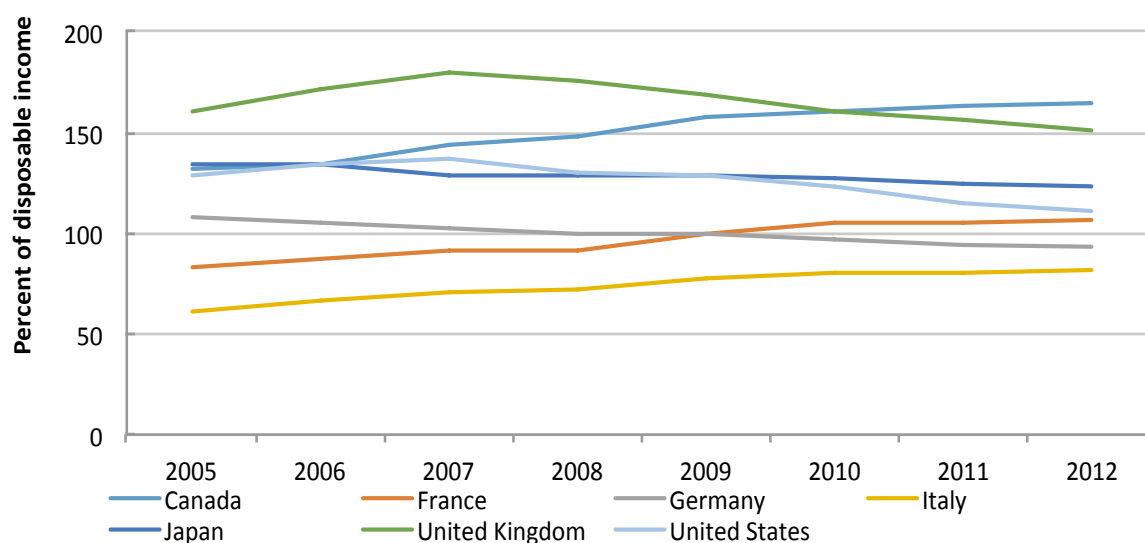
Investments in high yield and complex products clearly played a role in the financial crisis. In addition,

the use of leverage, either borrowing to invest or embedded in complex products, contributed to the build-up of pre-crisis risks. In the lead up to the crisis, leverage was used extensively by banks and households to speculate in the real estate, derivatives and structured and securitised products markets.⁵⁸

Leveraging is a method of taking on more risk, in return for a possibly larger pay off. Leveraging techniques can include:

⁵⁸ 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

FIGURE 70: HOUSEHOLD INDEBTEDNESS AS A PERCENTAGE OF DISPOSABLE INCOME – SELECTED COUNTRIES



Source: OECD

Note: Selected countries include only those available in the database.

- > the act of borrowing (capital or margin) in order to invest in another asset, with the assumption being that the income from the asset will offset the cost of borrowing;
- > financial products such as options and futures contracts; and
- > leveraging assets by using proceeds from a short sale of some positions to finance a portion of their portfolios.

During historical market booms, leveraging has been popular, allowing investors to greatly multiply their returns. In the lead up to the last financial crisis a number of factors are attributed to a steep rise in leverage⁵⁹ such as: financial innovation and the proliferation of complex products⁶⁰; declining interest rates in the developed world during the 1990s and early 2000s; and an “irrational exuberance” and trust in an ever-growing “new economy”. Furthermore, the taxation bias towards debt over

equity across most jurisdictions⁶¹ may have provided greater incentive for firms to use leverage through accumulating debt.⁶²

Leveraging also has the unfortunate consequence of magnifying losses in periods of (even small) market distress. During market stress and downturns, the prior build-up of leverage can have negative effects – potentially resulting in systemic risk.⁶³ This is because on and off-balance sheet leverage in times of market distress can contribute to firm losses (and consequent reductions in employment); bank liquidity shortages;⁶⁴ stock market volatility; and a reduction in cross-jurisdictional capital flows. Furthermore, subsequent deleveraging episodes can be severe and debilitating for economic growth. For example, in the aftermath of the financial crisis,⁶⁵

59 See Norman T L Chan, *Excessive leverage – root cause of financial Crisis*, Speech at the Economic Summit 2012, December 2011

60 Such as credit default swaps and subprime securitisation based on poor quality underlying assets e.g. mortgage backed securities, collateral debt obligations

61 The debt bias in taxation refers to the fact that interest payments on debt can be deducted from corporate taxation where equity returns cannot.

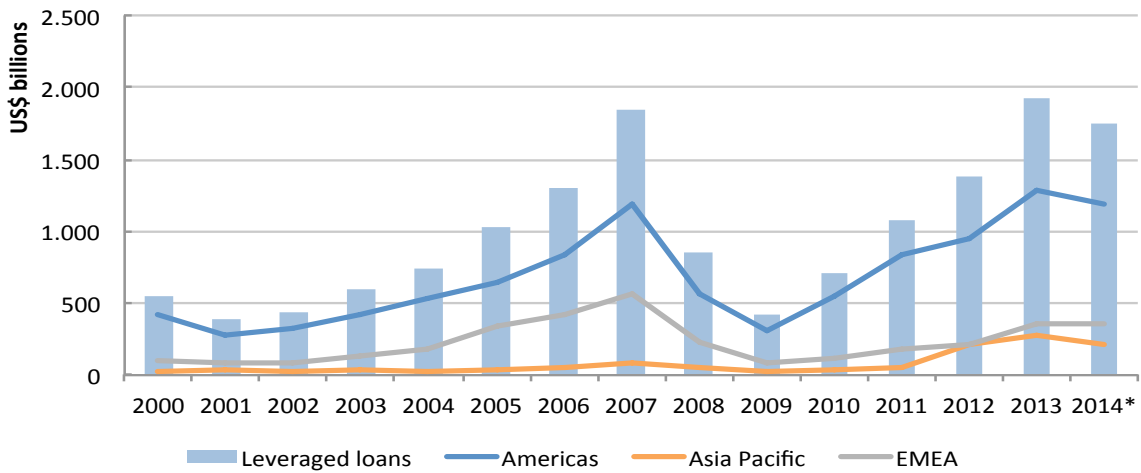
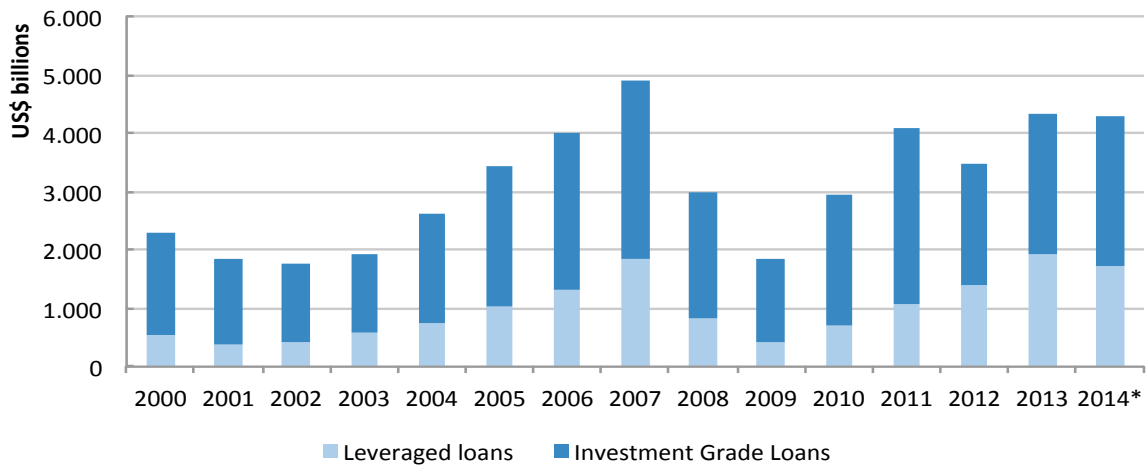
62 Ruud de Mooij, Michael Keen, Masanori Orihara, “Taxation, Bank Leverage and Financial Crises”, *IMF Working Paper*, 2013

63 See Fernando Duarte and Thomas M. Eisenbach, *Fire-Sale Spillovers and Systemic Risk*, Federal Reserve Bank of New York, 2013, which shows that leverage of an institution plays an important role in the vulnerability of institution to fire-sale spillovers.

64 See Nikolaos I. Papanikolaou and Christian C.P. Wolff, *Leverage and risk in US commercial banking in the light of the current financial crisis*, 2010

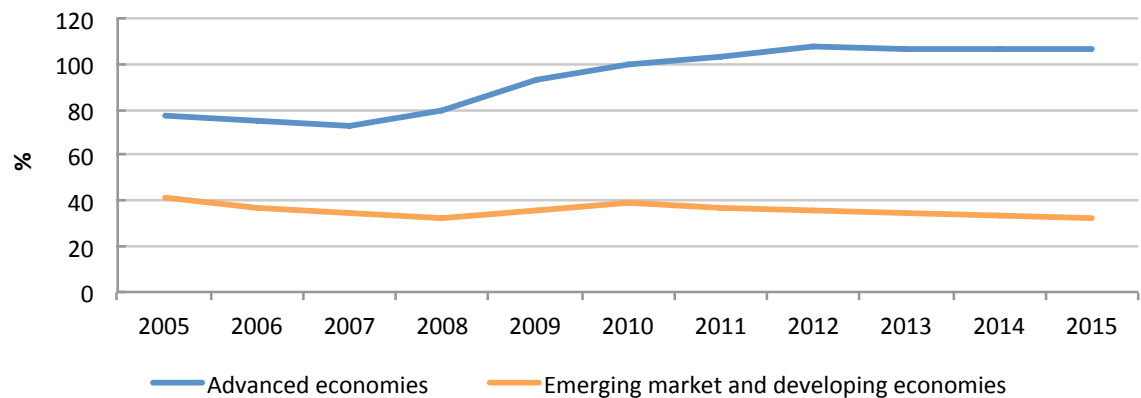
65 See, Sandor Gardo and Reiner Martin, “The Impact of the Global

FIGURE 71: LEVERAGED LOANS



Source: Dealogic

FIGURE 72: GENERAL GOVERNMENT GROSS DEBT TO GDP



Source: IMF

Note: 2014 data is IMF forecast

private debt to GDP ratios declined by almost 25% and GDP per capita fell by 9% on average.⁶⁶

While following the crisis there were initial signs of household and corporate credit-related deleveraging; however, leverage has since rebounded. Household debt as a percentage of disposable income has come down in the United Kingdom, United States, Germany and Japan, but has increased in Canada (see Figure 70).⁶⁷

The provision of leveraged loans, where loans are provided to firms that are already indebted, declined to a low of \$0.4 trillion in 2009. However, origination has since returned to pre-crisis highs (see Figure 71). In 2014, leveraged loan provision is projected to reach \$1.7 trillion, similar to the pre-crisis high reached in 2007 (\$1.8 trillion). The Asia Pacific region which registered minimal leveraged loan provision pre-crisis, registered \$207 billion in 2014.

Government debt as a percentage of GDP increased by almost 50% between 2007 and 2012 in advanced markets (see Figure 72). In recent years, government debt as a percentage of GDP has flattened in advanced markets, reaching a forecasted 106% of GDP in 2014. In emerging markets, government debt to GDP initially increased after the onset of the crisis but has been on a downward trend since 2010, reaching a forecasted 33% of GDP in 2014 compared to 39% in 2010.

While there has been some move towards deleveraging in certain sectors (households, emerging market government debt), in other areas deleveraging did not happen (advanced market government debt) and in some cases the trend is completely the reverse (leveraged loan provision).

Increasing leverage can signal returning confidence in the financial system, resulting in part from

policy interventions. However, as interest rates are anticipated to rise, any overvaluation in the market, exacerbated by excessive leverage, could be a potential trigger for risks to materialise in the financial system.

Assessing the risks

From a securities markets perspective, the return of leverage is apparent in the equity, bond, and securitised products markets.

Equity

In the equity space, margin debt in the US has increased substantially in the last few years.⁶⁸ Margin debt can be an indicator of confidence around future stock market performance but also potentially a sign of overvaluation.⁶⁹ Margin debt is incurred by an investor as a way to increase returns through the use of leverage, or simply to buy more stocks than their actual cash balance would allow. The debt must be secured by certain stocks and bonds. Both retail and institutional investors can incur margin debt.

Figure 73 compares the recent rise in US margin debt with the strong peaks in margin debt before the last two major financial crises (the dot com bubble and financial crisis). In the first quarter of 2014, margin debt reached almost \$450 billion, compared to a high of \$378 billion before the most recent financial crisis and \$279 trillion before the “dot-com bubble” burst.

Of note is a growing recognition that the value of stocks over the last few years has been fuelled in large part by buybacks.⁷⁰ Stock buybacks can involve a firm either using retained earnings or borrowing funds to buy back their own stocks, thereby increasing the value of their stocks (by reducing the supply). In the latter case, such an activity is an increasingly attractive option in the current low interest rate environment, where borrowing costs are low. However, as the United States Federal Reserve

Economic and Financial Crisis on Central, Eastern and South-Eastern Europe”, *European Central Bank, Occasional Working Papers*, 2010; Tyler Atkinson, David Luttrell, Harvey Rosenblum, “How Bad Was It? The Costs and Consequences of the 2007-2009 Financial Crisis”, *Federal Reserve Bank of Dallas, Staff Paper*, No. 20, July 2013

66 McKinsey Global Institute, *Debt and deleveraging: The global credit bubble and its economic consequences*, July 2011; Carmen Reinhart, *The Economic and Fiscal Consequences of Financial Crises: North and South*, World Bank Institute.

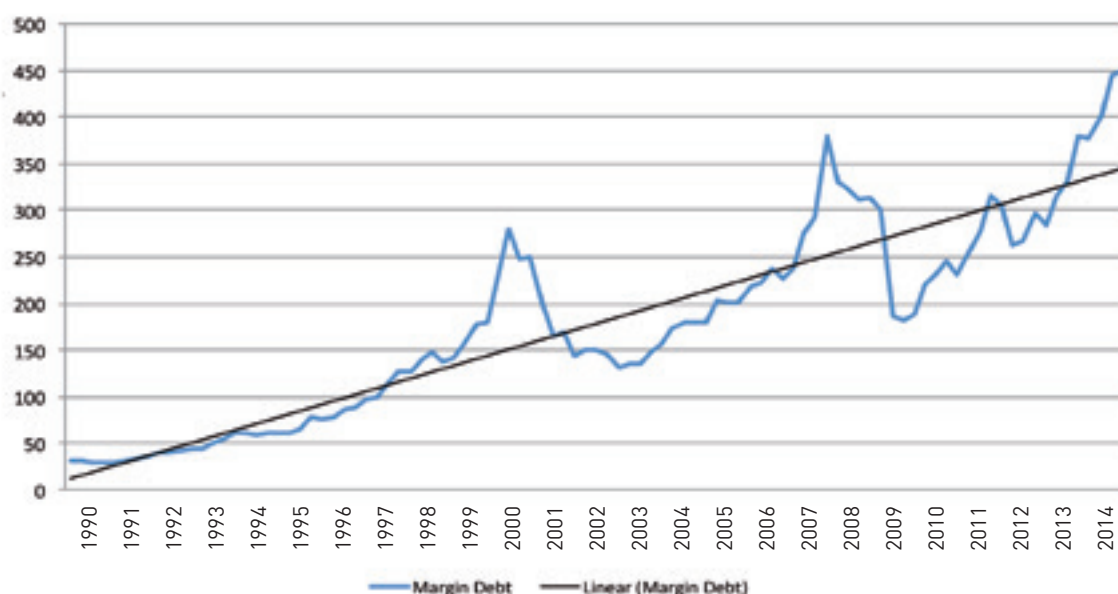
67 The percentage has also increased in France and Italy, however this is most likely a reflection of increasing nominal household income.

68 Margin debt refers to money borrowed by investors to buy stocks and thus constitutes a form of leverage. The borrowed money is secured by the investor’s investment holdings.

69 See Deutsche Bank, *Red Flag! – The Curious case of NYSE margin debt*, 16 August 2013

70 During 2013, share buybacks of S&P 500 companies increased by almost 20% reaching \$476 billion [see: <http://www.indexologyblog.com/2014/03/26/companies-buy-fewer-shares-but-issue-even-less-reducing-their-share-count-and-pushing-up-eps/>]

FIGURE 73: MARGIN DEBT – US (NYSE)



Source: NYSE

begins to step back from its extraordinary monetary policy, interest rates will begin to normalise.

Another cause for the recent spike in margin debt may be the growth in hedge funds (in terms of assets under management). Hedge funds are increasingly using margin debt to manage their liquidity, rather than using the services offered by their prime brokers.⁷¹ However, a breakdown of usage of margin debt is not available making it difficult to adequately assess this risk.

Regardless, if interest rates rise in the future, the cost of issuing debt will increase and the return on equity will suffer a relative decline; this could rebalance incentives away from issuing debt for stock buybacks and use of margin. As such, stock valuations may potentially turn a corner and margin calls may lead to a demand for cash and eventually create liquidity pressures throughout the financial system. For example, in a leveraged buyout scenario, the increasing interest rate environment could cause a rating downgrade. Stock prices would react accordingly, which could lead to margin calls if stocks are lent out. Additionally, there would be an

effect on bond prices, which may fall, and if these bonds are being used for collateral there could be a variation margin call, too.

Leveraged buyouts are increasingly tied to stock market performance through private equity. This activity is captured in the indicator “corporate leveraged buyouts” (see Figure 74).⁷² These buyouts have surged in the post crisis period reaching a projected \$635 billion in 2014, well above the 2007 peak of \$320 billion. The increase in corporate leveraged buyouts⁷³ is identifiable in the Americas, Asia Pacific and EMEA. Most notably in the U.S., the equity “dry powder” available for investment (i.e. equity still available for the global economy), reached \$1.2 trillion in the second quarter of 2014.⁷⁴ In the U.S., there is some anecdotal evidence that pension funds are considering ways to include private equity funds in their investment product mix.⁷⁵

72 Corporate leveraged refers mostly to leveraged buyouts through private equity.

73 Corporate leveraged refers mostly to leveraged buyouts through private equity.

74 See Prequin <http://www.prequin.com/docs/reports/Q2-2014-Private-Equity-Fundraising.pdf>

75 For example see Taha Lokhandwala, “Allocations to private equity increasing at European pension funds”, *Investment & Pensions Europe*, January 2014; Private Equity Growth Capital Council, *Long-Term Commitments: The Interdependence of Pension Security and Private Equity*, 2013

71 See JP Morgan Research and Credit Suisse, *First Look*, 2014

Private equity takes on leveraged loans for a number of reasons, including for the takeover of publically listed company. The company is privatised, restructured/rebranded and then reintroduced to the market through a new initial public offering, often after a few years. Leveraged buyouts via private equity can have a number of benefits, provoking improved performance, economic efficiency and streamlining of the company; encouraging the managerial level to invest “skin in the game”; plus passing on large returns to private equity investors.

At the same time, such buyouts contain risks. The leveraged loans taken on by private equity to execute the buyout can have advantages for the private equity investors, since only a small amount of private equity capital needs to be put forward for potentially high returns. However, it is the target company that typically acquires this leveraged debt. During periods of market distress, the company may face difficulties in servicing its debt. In fact, during the most recent financial crisis, a number of private equity-run businesses faced bankruptcy, unable to service the leveraged loans they had acquired through the buyout. Losses from these bankruptcies were transmitted to the banks financing the buyouts

and the private equity investors – including pension funds.

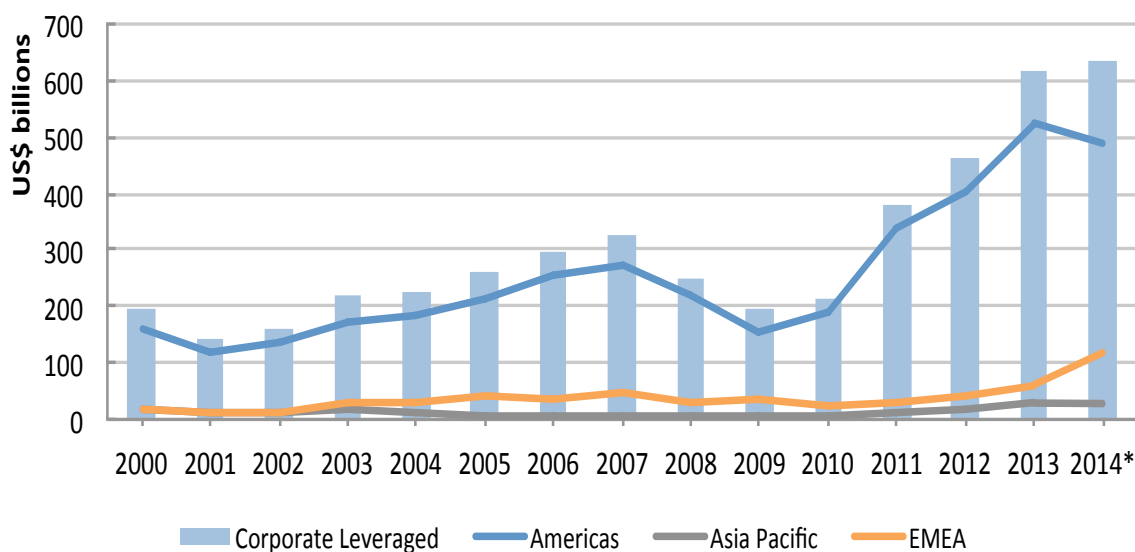
It is no surprise that leveraged buyouts via private equity have surged once again with the recent stock market rally and low borrowing costs, but if stock markets falter and interest rates (and thus borrowing costs) increase, sponsoring banks and private equity investors could once again face significant losses.

Debt markets

Despite some deleveraging of financial firms after the crisis, financial and non-financial firms are taking on more debt. In the bond markets, non-financial issuances of corporate bonds soared in 2009 and again in 2011 (matching the injection of liquidity through central bank asset purchasing programs in the US and Europe), corporate bond issuance from financial institutions shrunk after 2009 (see Figure 75). However, issuances from financial firms surged in 2014. Financial firm issuance is projected to reach \$1.5 trillion in 2014 while issuances from non-financial firms are projected to reach \$2.2 trillion.

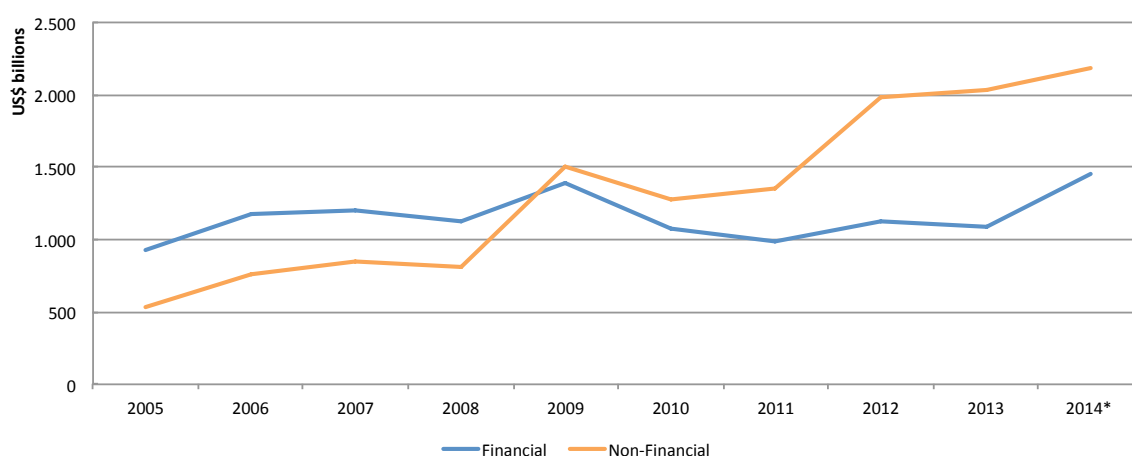
Of particular interest is the amount of leveraged financing occurring through loan and bond

FIGURE 74: CORPORATE LEVERAGED BUYOUTS (PRIVATE EQUITY BUY OUT)



Source: Dealogic

FIGURE 75: CORPORATE BOND ISSUANCE



Source: Dealogic

markets.⁷⁶ Leveraged financing can occur through borrowing loans or issuing high yield bonds for particular purposes. These purposes include funding buyouts and similar activities. Figure 76 indicates that total leveraged financing through loans and high yield bond markets hit a peak in 2007, reaching \$2.1 trillion. The build-up of leverage happened quickly. Between 2004 and 2007, leveraged financing increased more than 300%. With the onset of the crisis, leveraged financing dropped off steeply, to less than \$500 billion in 2009. By 2010 there was a modest resurgence, with leveraged financing stabilising over the last few years. In 2014, leveraged financing is expected to reach \$925 billion.

Leveraged loans are typically arranged by investment banks and provided to institutional investors such as mutual funds, pension funds and commercial banks. Leveraged loan mutual funds have also become popular in recent years. Leveraged loan mutual funds are funds that bundle illiquid bank loans into a mutual-fund style product. Investors decisively turned to leveraged loans mutual funds during 2013 (i.e. \$62bn in such funds, vs. only \$12bn in 2012), but based on some accounts this appetite has now strongly moderated, with net outflows seen in the second quarter of 2014.⁷⁷ High yield bonds are

issued by a firm and purchased mainly by pension funds, bond funds, banks and hedge funds – as well as some retail investors.

When looking at leveraged financing through the high yield bond markets in particular, we can see a clear return to pre-crisis levels (Figure 77). In 2007, this type of financing reached \$88 billion before dropping to just \$17 billion in 2008. By 2014, leveraged financing through the high yield bond markets had exceeded 2007 levels projected to reach \$119 billion. The majority of this financing is occurring in the Americas, although activity from EMEA has increased steeply over the past few years.

One of the characteristics of leveraged financing is that it is not used in funding normal business activities, expansion or innovation but often in “yield creation”, or in a one-time asset purchases or project.⁷⁸

Rising interest rates could cause difficulties for high yield bond holders in particular (including the target of buyouts) those attempting to rollover or service their debt, and result in losses for investors. High yield bonds are more interest-rate sensitive than

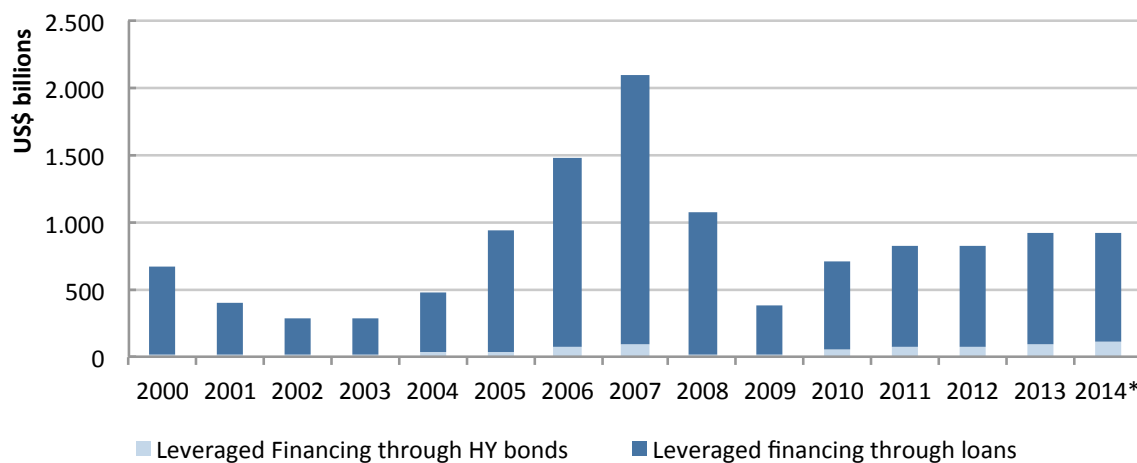
2014; Brendan Conway, *Bank Loans Funds Have Design Problem, Pose Risks*, Moody's 2014

76 For example leveraged buy-outs, issuance of bonds/borrowing for securitisation purposes and acquisitions

77 David Schawel, *The hidden risks of bank loan funds*, CFA, January 2014; The Wall Street Journal, *Investors Retreat from Bank-Loan Funds*, July

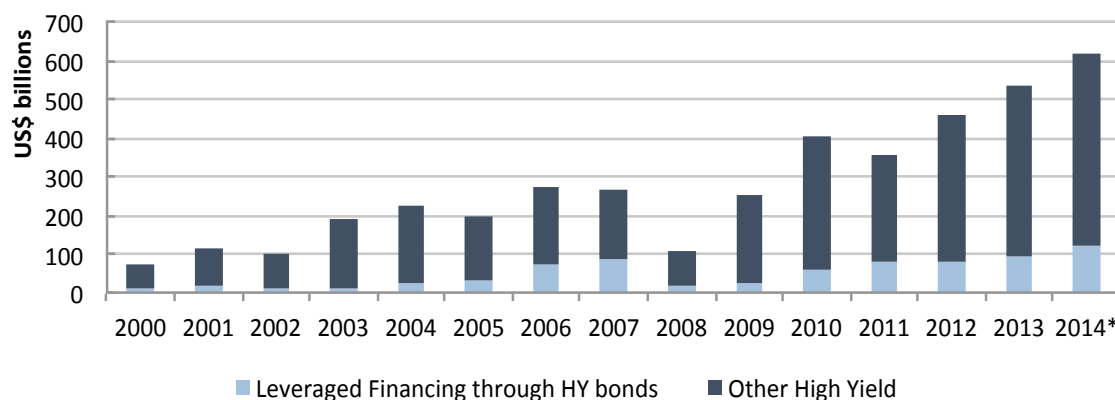
78 Professor Ian Giddy, New York University states “levered finance is commonly employed to achieve a specific, often temporary, objective: to make an acquisition, to effect a buy-out, to repurchase shares or fund a one-time dividend, or to invest in a self-sustaining cash-generating asset” in *Briefing: What is Leveraged Finance* [see Giddy.org]

FIGURE 76: LEVERAGED FINANCING – THROUGH LOANS AND HIGH YIELD BONDS

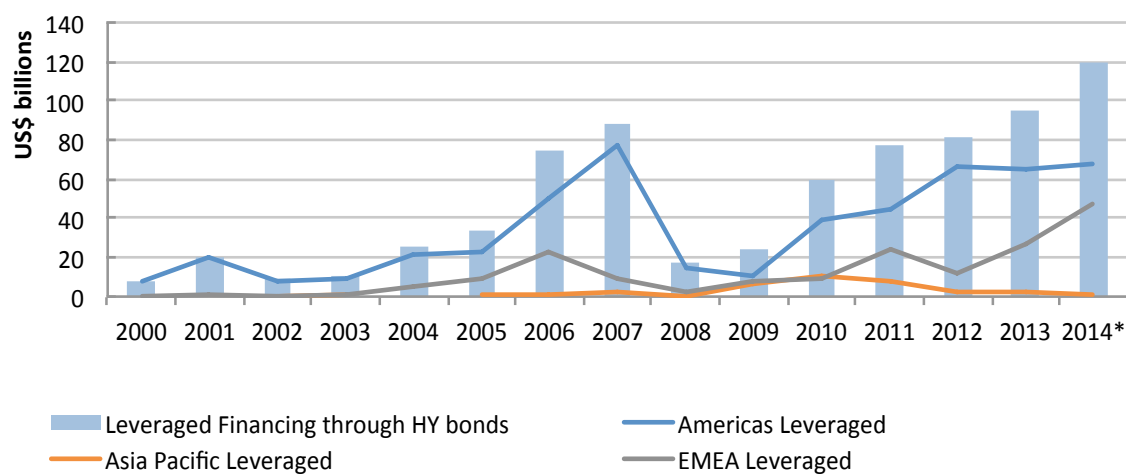


Source: Dealogic

FIGURE 77: LEVERAGED FINANCING THROUGH HIGH YIELD BOND MARKETS



Leveraged financing through HY bond markets – region breakdown.



Source: Dealogic

loans. Furthermore, unlike loans which tend to be backed by some form of collateral, high yield bonds are often unsecured and considered more junior debt.

Securitised products

Securitised products such as asset backed securities (ABS), mortgage backed securities (MBS) and collateralised debt obligations (CDOs) involve leverage. Additionally, some of these products can entail additional leverage. These products bundle debt from mortgages, credit-cards, bonds (including illiquid bonds) etc., and repackage them into securities. These securities are then divided into tranches which can be sold to suit a particular risk profile of an investor.

Before the crisis, securitisation was viewed as a way to efficiently spread credit risk. However, after the onset of the crisis, many observers identified securitised products as a root cause of risk build-up prior to 2007 – lowering lending standards and flooding the market with cheap credit.⁷⁹ Banks bought securities from each other using borrowed money, further increasing leverage. During the crisis, holders of securitised products suffered massive losses. Wariness on the part of investors contributed to a shrinking of demand for these products.

In recent years, the global issuance of securitised products has been flat (see Figure 78). Issuance peaked at \$2.7 trillion in 2006, before falling back to under \$500 billion in 2008. In 2014, these issuances have increased overall, reaching \$691 billion but are still well below pre-crisis levels (and only marginally higher than in 2000).

Nevertheless, asset backed commercial paper appears to have turned a corner (with the exception of EMEA), ticking upwards in 2014 (see Figure 79). In 2014, issuance is expected to reach \$301 billion. While only a quarter of the total issuance volume of 2006 (\$1.2 trillion), the 2014 figure would be three times the low recorded just four years ago in 2010 (\$100 billion).

MBS issuance has been steady in recent years, albeit declining slightly in 2014 – with expected issuance at \$389 billion, still well below the pre-crisis high of \$1.6 trillion (see Figure 80).

Issuances of other securitised products such as CDOs have ticked up in the last few years. In 2014, issuance of CDOs is expected to reach \$86 billion. This is well below the 2006 pre-crisis peak of \$176 billion but also more than 8 times the post-crisis low in 2010 of \$9 billion. Most of this uptick is attributable to a rise in issuance of collateralised loan obligations (CLOs) (see Figure 81). Collateral bond obligations (CBOs) issuances have remained muted since the onset of the crisis. In 2014, it is expected that CLO issuance will reach \$83 billion and CBO issuance will reach just \$3 billion. The upswing in CLO issuance is another indicator of leverage and risk taking creeping back into the market, although issuance levels are well below the peak reached in 2006.

The return of securitised products is in part fuelled by a search for yield and in part by economic recovery (which has heightened risk appetite), which is in turn fuelling demand for products (both financial and non-financial) and consequently demand for credit to purchase these products. This credit can then be securitised and resold on the market with attractive yields.⁸⁰ Securitisation is increasingly being viewed as a way to allow markets to fill the gap that will be left by banks facing higher capital ratios.

However, the increase in issuance of these kinds of products is symptomatic of the general trend towards leverage and risk taking observed throughout the financial system.

Hedge Funds

According to data from Credit Suisse, hedge fund leverage has been slightly upward trending since 2009 (see Figure 84), reaching 2.62 times at the end of May 2014. This is still below the high of 2.71 times in March 2011.

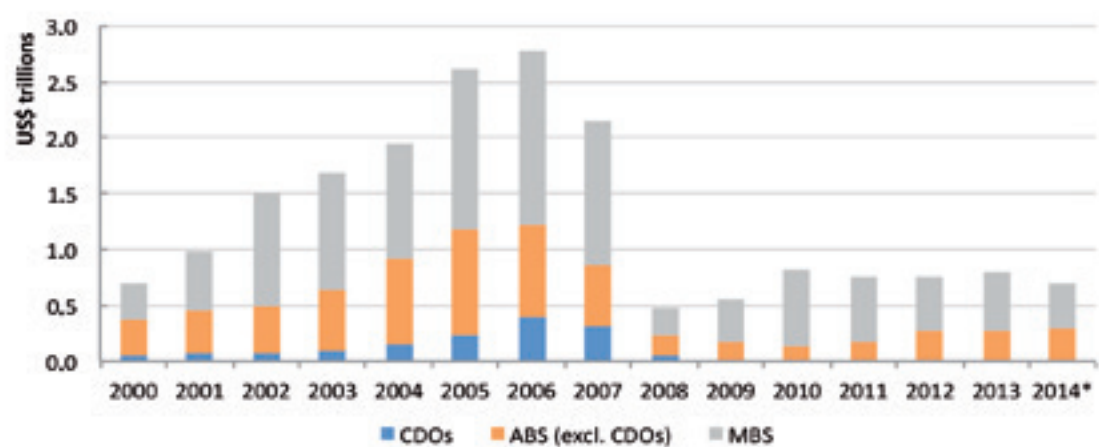
In October 2013, IOSCO published a “Report on the second IOSCO hedge fund survey”,⁸¹ which

79 See Hyun Song Shin, “Securitisation and Financial Stability”, *The Economic Journal*, March 2009; M Brunnermeier, “Deciphering the liquidity and credit crunch 2007-2008”, *Journal of Economic Perspectives*, 2009; B. Keys, T. Mukherjee, A. Seru and V. Vig, “Did securitization lead to lax screening? Evidence from subprime loans”, *Quarterly Journal of Economics*, vol 125, 2010

80 See The Economist, *Back from the Dead*, January 2014

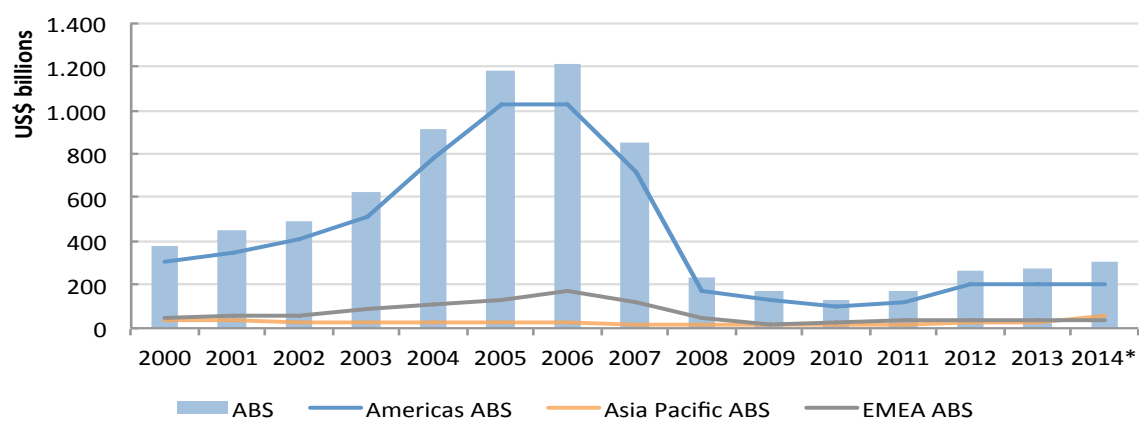
81 IOSCO, “Report on the second IOSCO hedge fund survey”, October

FIGURE 78: SECURITISED PRODUCT ISSUANCE



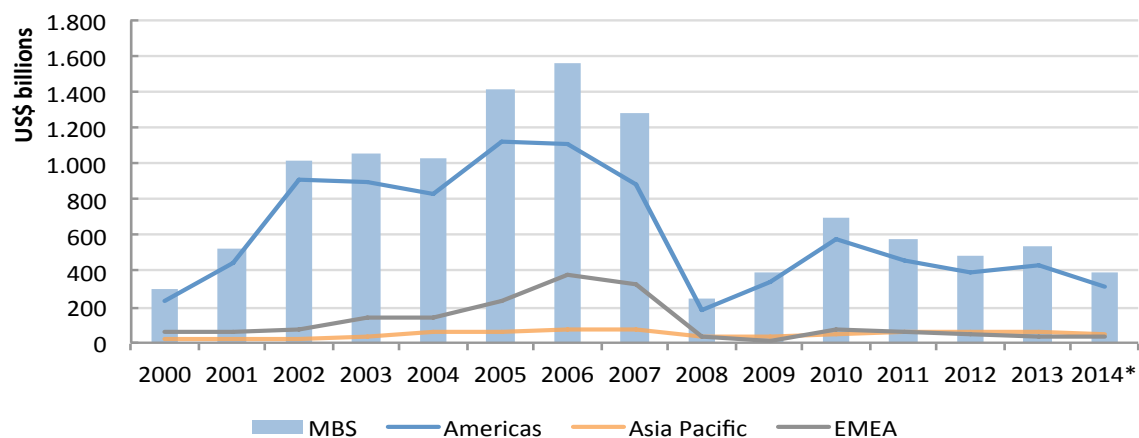
Source: Dealogic

FIGURE 79: ISSUANCE OF ASSET BACKED COMMERCIAL PAPER



Source: Dealogic

FIGURE 80: MORTGAGE BACKED SECURITIES



Source: Dealogic

explored hedge fund leverage in terms of financial leverage and synthetic exposure through derivatives. The report noted the lack of adequate data available to make an assessment of hedge fund leverage. However it appears that synthetic exposures explained the largest share of overall gross leverage of hedge funds in aggregate.⁸²

One piece of evidence related to leveraged hedge fund activity suggests that a small number of hedge funds are borrowing to buy structured products such as CLOs.⁸³ Hedge funds appear to also be increasingly borrowing to buy equity.⁸⁴ Further research into leverage practices of hedge funds is needed before an assessment of the risks can be made. The lack of data and understanding makes it difficult to assess risks.

Looking Forward

Leverage in the system can magnify seemingly small liabilities. Furthermore, leverage introduces risks of procyclicality and increased volatility. The increase in leverage observed in securities markets over the last few years – up to pre-crisis levels in some cases – presents a clear case for continued research and risk monitoring, and possible adoption of combined measures from regulators and monetary authorities.

More granular data gathering, scenario analysis and stress testing are important in assessing the risks of a return of leverage in financial markets. Such exercises would be especially important considering the unwinding of accommodative monetary policy anticipated in the near-term and slowing growth in some major emerging markets (See Chapter 2). Once the current low interest rate environment ends, the build-up of leverage and speculation may make markets particularly fragile to a turn in investor confidence. Investor confidence can be a determinant of systemic risk, but is also something that is difficult to predict.

At this stage, it would be pre-emptive to assess

whether the return to leverage is systemic. However, there are indicators suggesting an increase in complexity, leverage and risk appetite. These trends are occurring in part due to an artificially low interest rate environment with high levels of liquidity flushing through the system. At the same time transparency is still lacking and data is scarce, making it difficult to evaluate how leverage chains are forming and where risks are pooling.

A number of jurisdictions have already put in place regulations to limit the highly risky aspects of certain products introduced before the last crisis, such as CDOs.⁸⁵ However, there is no guarantee that institutional investors will be any better at handling the risks than in the run up to the last crisis.

2013

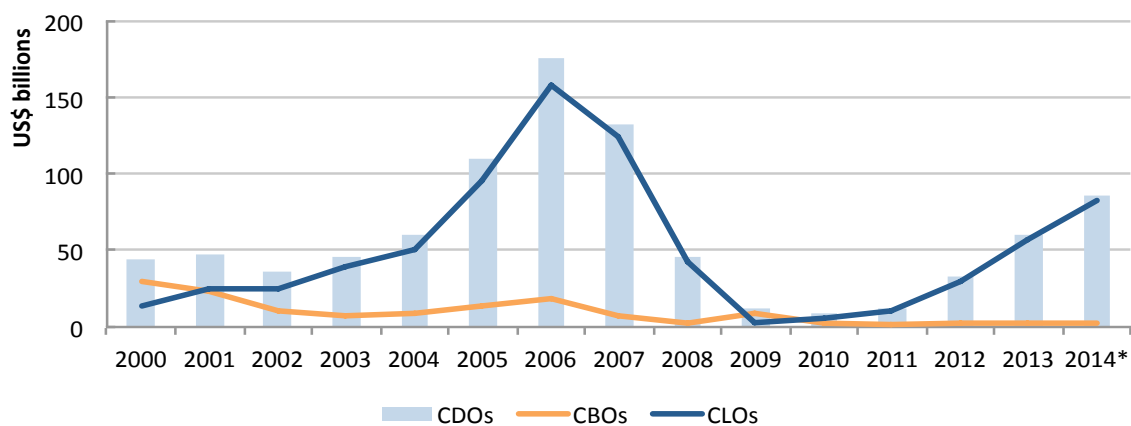
82 Does not include US data

83 See Tracy Alloway, “Hedge funds warned over leveraged CLO deals”, *Financial Times*, June 2014.

84 See Whitney Kising, “Hedge Fund Leverage Rises to Most Since 2004 in New Year”, January 2014.

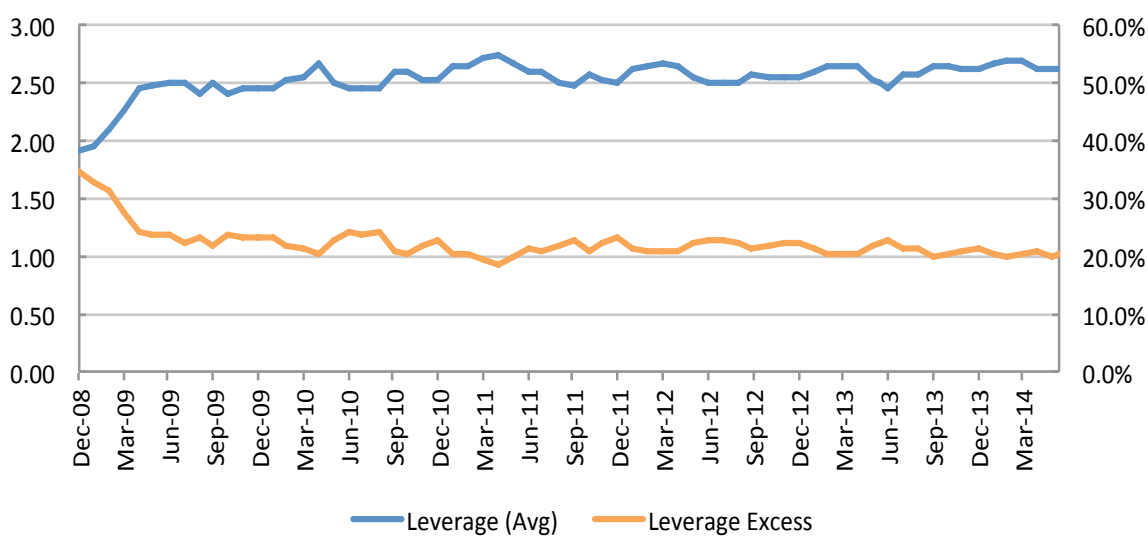
85 For example in the United States, the Dodd-Frank Act and Consumer Protection Act require issuers of ABSs to retain “skin in the game”.

FIGURE 81: CLO AND CBO ISSUANCES



Source: Dealogic

FIGURE 84: HEDGE FUND LEVERAGE AND LEVERAGE EXCESS



Source: Credit Suisse

Chapter 2: Search for Yield and Volatility Affecting Emerging Markets

In last year's Risk Outlook, the risks associated with a potential reversal in cross-border capital flows to emerging markets (EMs) were analysed. It was noted that, historically, EMs have experienced boom-bust cycles as capital flows face “sudden stops” or even reversals. Furthermore, these bust cycles tend to “follow periods of increased capital inflows, robust economic conditions and low interest rates in advanced economies”.⁸⁶

Last year's Outlook also noted that EMs with shallow capital markets, low liquidity, large current account deficits, fixed exchange rates, over reliance on short-term debt and low reserves are more vulnerable to sudden reversals in capital flows. It was noted that “continued focus on developing sound and efficient securities markets in EMs can contribute to overall stability of the regions, including in the face of volatile capital flows”.

In this year's Risk Outlook survey,⁸⁷ 70% of respondents noted capital flows to emerging markets as an area to explore further in the context of financial stability. Responses noted the interdependency and interconnectedness of emerging and developed markets. This chapter of the Outlook will provide an update of last year's analysis – focusing on potential trigger factors for a reversal of capital flows.

For the purposes of this report,⁸⁸ emerging market regions are broadly categorised as “Emerging Europe”, “Emerging Asia”, “Emerging MEA” (Middle-East and Africa) and “Emerging Latin America”;⁸⁹ specific countries are referenced based on the availability of data. However, it is important to note that economic conditions, as well

as infrastructure, development levels and legal and institutional frameworks differ across these regions.⁹⁰ This suggests that analysis of risks and their impact may not apply evenly across EMs.

Background

Since the onset of the crisis, investors – both foreign and domestic – have exhibited increased confidence in investing in and lending to EMs. Figure 85 shows capital flows⁹¹ into emerging markets since 2005. These flows initially dropped at the onset of the crisis. However, with the exception of emerging MEA, they soon rebounded as “push” and “pull”⁹² factors attracted foreign investment – for example, the search for yield environment in developed markets (“push factor”) and increased financing needs in emerging markets (“pull factor”). The search for yield environment took hold as developed markets put in place accommodative monetary policies in the wake of the crisis and yields were driven down. Strong growth and industrialisation in many EMs created a demand for the *easy* money being funnelled into the global financial system by developed market central banks. Furthermore, developments within emerging market regions encouraged more south-south lending, that is, lending among emerging markets.⁹³

Nevertheless, in the last few years, inflows to Emerging Asia, Emerging Latin America and Emerging Europe have declined, although they are still above the 2008/2009 trough period, with the exception of Emerging Europe. In 2014, it is projected, based on IIF estimates, that private net inflows to Emerging Asia will reach \$573 billion; to Emerging Latin America will reach \$265 billion; to Emerging Europe and Emerging Africa and Middle East will reach around \$98 billion.

86 IOSCO, *Securities Markets Risk Outlook 2013-2014*, October 2013

87 Shane Worner, “A Survey of Securities Markets Risk Trends 2014: Methodology and Detailed Results”, *IOSCO Research Department Staff Working Paper*, June 2014

88 While the exact country classification of EMEs varies slightly from institution to institution and authority to authority, criteria are generally based on income or “quality” factors such as political, institutional or social arrangements. See Lynge Nielsen, “Classifications of Countries Based on Their Level of Development: How it is done and how it could be done”, *IMF Working Paper*, 2011. As a general rule, EMEs are understood to refer to countries with high levels of risk but also high-growth potential (See Ashoka Mody, “What Is an Emerging Market?”, *IMF Working Paper*, 2004).

89 Availability of data influences which countries are considered for each region category.

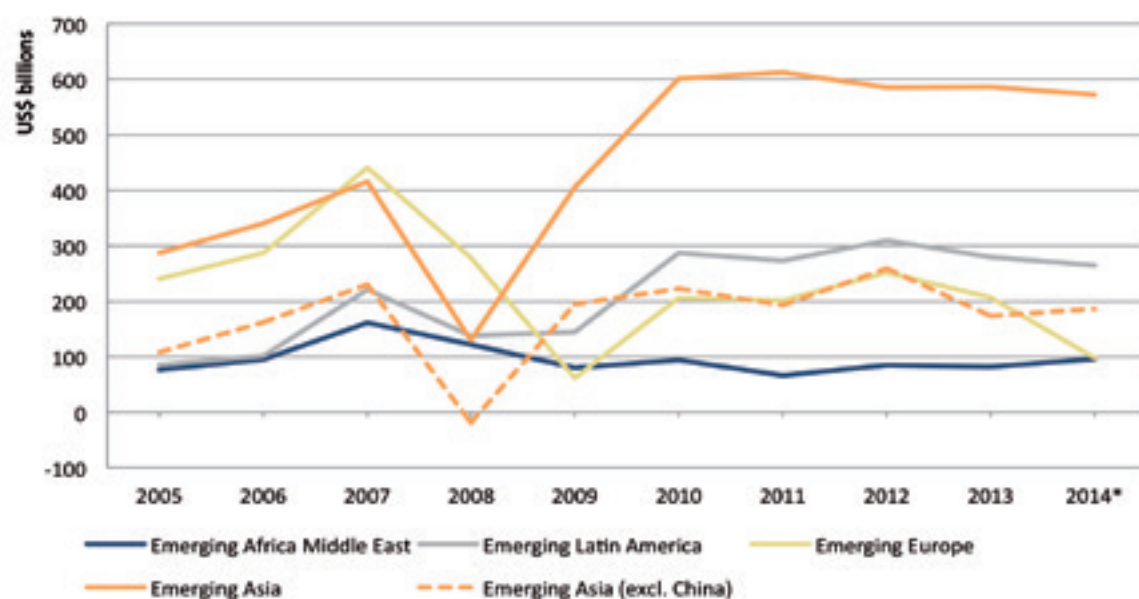
90 Rudiger Ahrend & Antoine Goujard, “Global Banking, Global Crises The Role of the Bank Balance-Sheet Channel for the Transmission of Financial Crises”, 2014

91 Data is from the IIF. Net inflows – which refers to non-resident moves.

92 Push factors include the low interest rate environment in major advanced economies and changing sovereign risk profiles. Pull factors include relatively higher interest rates in emerging economies, attractiveness of EMEs as an investment destination and high economic growth.

93 See McKinsey Global Institute, *Global Flows in a Digital Age: How trade, finance, people, and data connect the world economy*, April 2014; IIF, *Capital Flows to Emerging Markets*, 2013

FIGURE 85: TOTAL PRIVATE CAPITAL NET INFLOWS (FOREIGN MOVEMENTS) TO EMERGING MARKETS



Source: IIF, May 29 2014

Note: Total across sample countries. Emerging Africa and Middle East include Nigeria, Egypt, Morocco, South Africa, Lebanon, Saudi Arabia; Emerging Latin America include Argentina, Brazil, Chile, Columbia, Ecuador, Mexico, Peru, Venezuela; Emerging Europe includes Bulgaria, Czech Republic, Hungary, Poland, Romania, Russia, Turkey, Ukraine; Emerging Asia includes China, India, Indonesia, Korea, Malaysia, Philippines, Thailand.

A noteworthy change in the profile of cross-border flows to emerging markets is the preponderance of cross-border non-bank credit provision to EMs since the crisis. Figure 86 shows that cross-border non-bank credit provision (which includes through corporate bond issuance) has grown universally across the emerging markets region. In contrast, bank credit provision contracted in the immediate aftermath of the onset of the crisis, although it picked up somewhat in the last few years.

The changing ratio of bank to non-bank credit provision in EMs is most likely attributable to more conservative bank lending practices in developed markets, brought about by regulation such as Basel III capital requirements, and internal risk controls. From a securities markets perspective, the rise of non-bank lending hints at a more diverse global financial ecosystem that is servicing EMs.

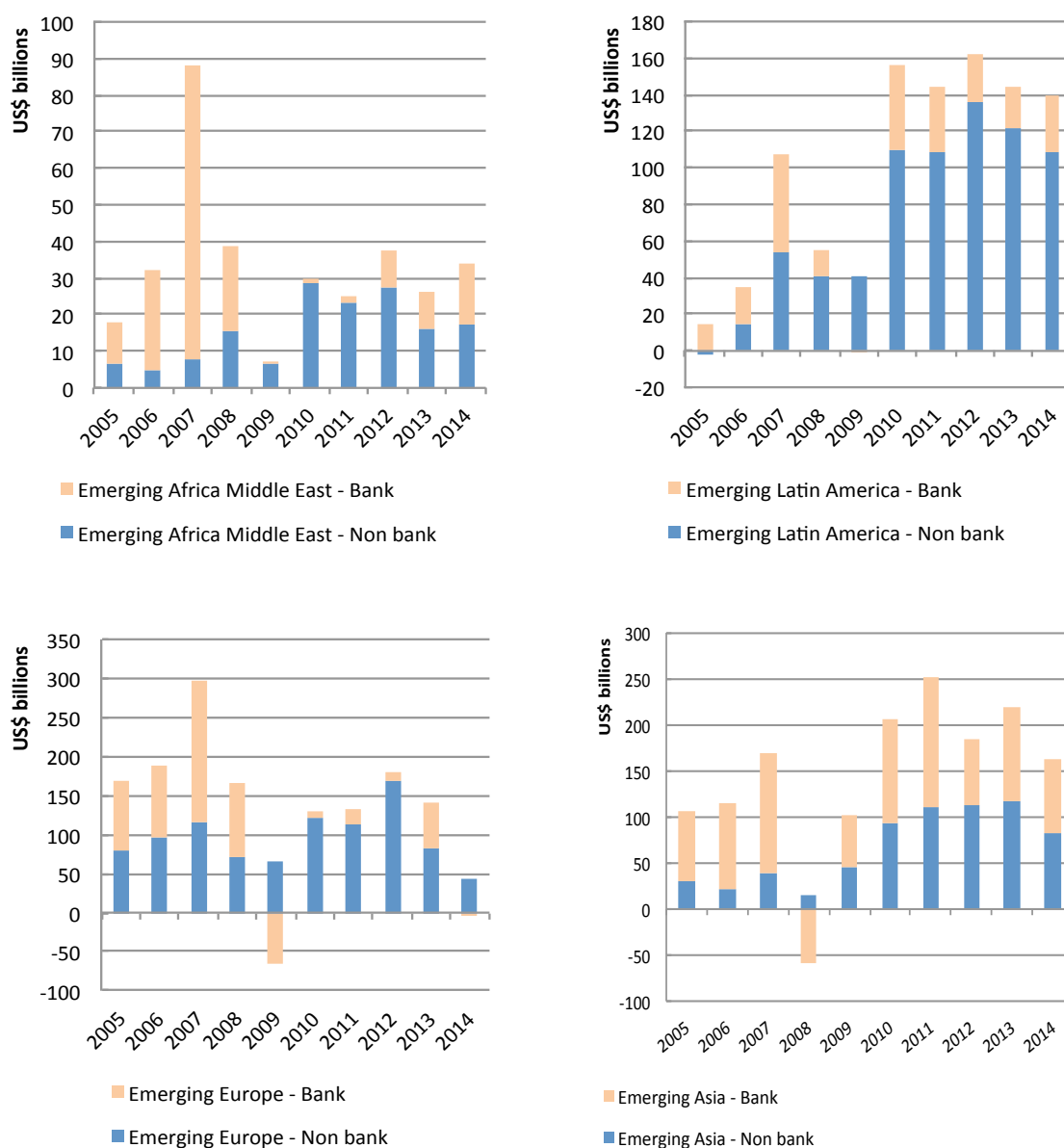
Figure 87 reveals that cross-border securities markets financing to EMs through equity markets vary from region to region. In emerging MEA, portfolio equity

inflows have been growing over the last few years and are expected to reach \$15 billion in 2014, compared to \$47 billion in foreign direct investment (FDI). In emerging Latin America, portfolio equity inflows have been shrinking slightly over the last few years, expected to reach \$14 billion in 2014, compared to \$112 billion in FDI.

In Emerging Europe, net inflows of portfolio equity have been negative over the last two years. FDI has remained relatively stable, projected to reach \$60 billion in 2014. Portfolio equity inflows to Asia are expected to grow to \$89 billion in 2014. FDI inflows have remained stable over the last few years, expected to reach \$321 billion in 2014.

Portfolio equity and short-term debt are considered the most volatile form of inflow as investors can easily sell or wait for the debt to mature without rolling it over or reinvesting. Also, corporate bonds with put options, which face a significantly more illiquid secondary market than stocks, also introduce an aspect of volatility to financing. While these

FIGURE 86: CREDIT PROVISION FLOWS

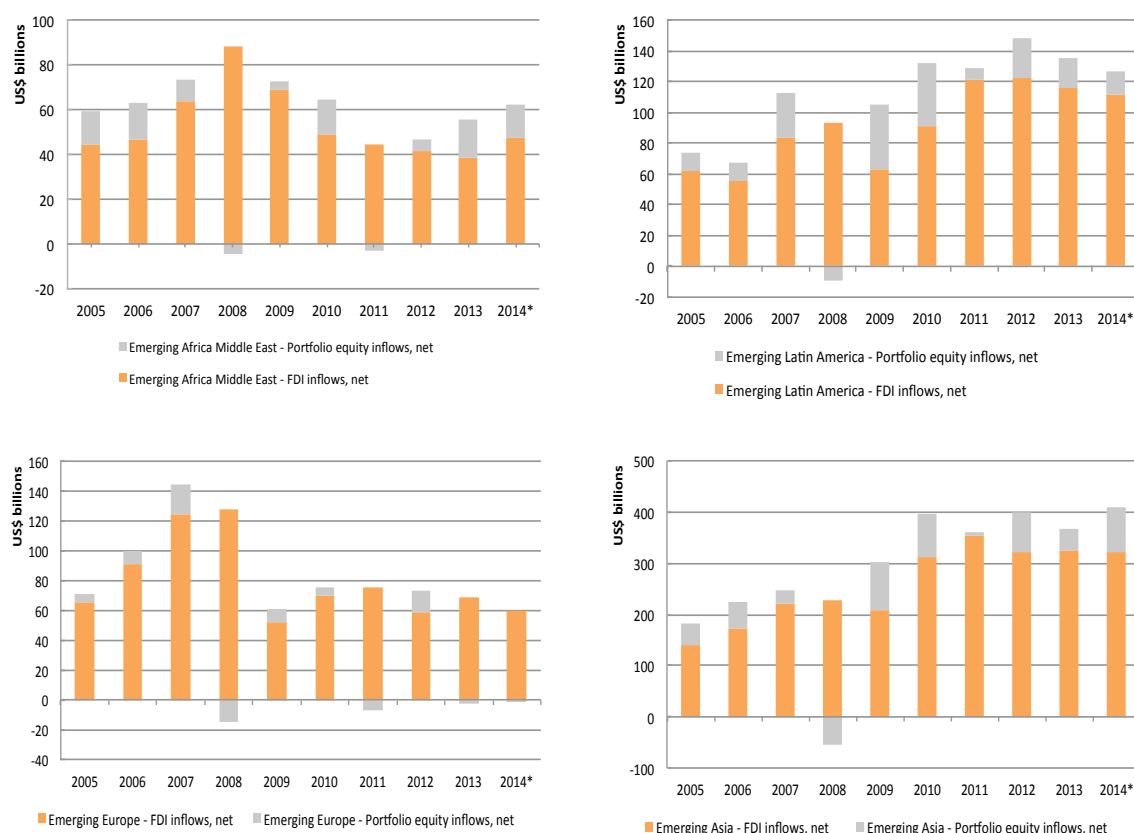


Source: IIF, May 29 2014

Note: Total across sample countries. Emerging Africa and Middle East include Nigeria, Egypt, Morocco, South Africa, Lebanon, Saudi Arabia; Emerging Latin America include Argentina, Brazil, Chile, Columbia, Ecuador, Mexico, Peru, Venezuela; Emerging Europe includes Bulgaria, Czech Republic, Hungary, Poland, Romania, Russia, Turkey, Ukraine; Emerging Asia includes China, India, Indonesia, Korea, Malaysia, Philippines, Thailand.

Note: Non-bank credit provision refers to "net external financing provided by non-bank private creditors. This includes flows from nonbank sources into bond markets, as well as deposits in local banks by non-residents other than banks. It also includes credit by suppliers (excluding credits guaranteed or insured under credit programs of creditor governments), identified private placements of debt securities, and other financial securities issued in local or foreign currencies. Finally, it includes estimated interest payments due but not paid and estimated payments flow with private creditors other than commercial banks resulting from discounted debt transactions." (see IIF Capital Flows User Guide)

FIGURE 87: SECURITIES MARKETS FLOWS TO EMERGING MARKETS – FDI AND PORTFOLIO EQUITY



Source: IIF (May 29 2014), BIS (end-December 2013, 2014 figures extrapolated)

Note: Aggregated total across sample countries. Emerging Africa and Middle East include Nigeria, Egypt, Morocco, South Africa, Lebanon, Saudi Arabia; Emerging Latin America include Argentina, Brazil, Chile, Columbia, Ecuador, Mexico, Peru, Venezuela; Emerging Europe includes Bulgaria, Czech Republic, Hungary, Poland, Romania, Russia, Turkey, Ukraine; Emerging Asia includes China, India, Indonesia, Korea, Malaysia, Philippines, Thailand.

bonds offer a less expensive source of financing for corporates, they can also lead to uncertainty around future cash flows from the issuer's perspective,⁹⁴ as investors can redeem their invested capital prior to nominal maturity. Puttable bond issuances experienced a surge in the aftermath of the crisis, reaching a high of \$61 billion in 2012. However, issuance has since decreased in 2013 and 2014 (albeit still double 2008 levels), projected to reach \$31 billion in 2014 (see Figure 88).

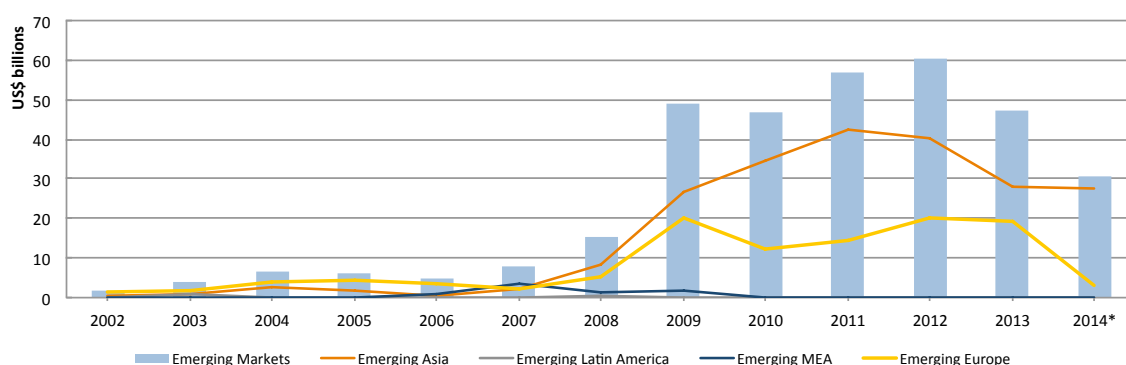
94 Rohini Tendulkar and Gigi Hancock, "Corporate bond markets: a global perspective", *IOSCO Research Department Staff Working Paper*, 2013

While flows data varies from region to region, in general, the increasing proportion of non-bank credit to total flows to EMs, puttable bond issuances and portfolio equity flows, confirms the growing importance of cross-border securities markets financing for EM. As such, understanding the risks associated with a reversal of capital flows to EMs are very relevant from a securities markets perspective.

Understanding the Risks

As a rule, the securities markets in EMs are beginning to develop in size, although they remain relatively illiquid compared to those in advanced

FIGURE 88: PUTABLE BOND ISSUANCE



Source: Dealogic

economies.⁹⁵ This means that volatile capital flows to these economies still remain a point of risk entry for regional securities markets.⁹⁶ From a systemic risk perspective, a reversal of capital flows to EMs could have spillover effects for financial market activity globally and exacerbate a growth slow-down in emerging markets. A reversal of capital flows to EMs could be triggered by the following:

- > an unwinding of monetary policies in the developed world (See Box 3);
- > slowing growth prospects for EMs; and/or
- > political unrest.

Much research has already been done on the exposure of EMs to a reversal of capital flows.⁹⁷ As EMs experience large capital inflows, the demand for assets increases. At the same time the supply of these assets lags behind, causing asset prices to rise. In order to accumulate more of these higher priced assets, buyers will borrow more (leverage) – including through cross-border credit provision – which in turn translates into heightened cross-border flows and pushed up asset prices.

95 See Liliana Rojas-Suarez, “Towards strong and stable capital markets in emerging market economies”, *BIS Paper No. 75*; ACCA, *The Rise of Capital Markets in Emerging and Frontier Economies*, March 2012

96 J.D. Stanford, “Emerging Capital Markets”, *International Economics, Finance and Trade*, Vol 1, - “Analysis of financial crises in Mexico, Asia and Brazil suggest that financial crises are caused by inadequate preparation for engagement in global financial markets and that emerging economies have to strengthen their domestic financial sectors”

97 See Kalpana Kochbar, “Emerging Markets: Prospects and Challenges”, IMF, October 2013; IMF, *World Economic Outlook*, February 2014; IMF, *Emerging Markets in Transition: Growth Prospects and Challenges*, April 2014

This concern is more acute in markets that have shown a strong historic correlation between the real estate markets and the securities markets or where real estate development represents a large share of economic activity. For example, recent research suggests that a large influx of debt-related flows is correlated with a steep rise in housing prices.⁹⁸ According to the Lloyds International Global Housing Market Review, house prices in emerging markets soared between 2001 and 2011. India leads with a real increase of 284% compared to 2001 levels (14% annually). Russia and South Africa also registered steep rises (209% and 161% respectively). Over the same period, China’s house prices increased 47%, Korea’s increased 31% and Malaysia 22%.⁹⁹

A sudden reversal of capital flows to EMs would impact exchange rates and interests rates, and could result in a significant asset price revaluation as capital exits, especially where domestic securities markets (in terms of domestic investors and issuers) are not large. Such currency depreciation on the one hand could translate into inflationary pressures if there is a passthrough effect, but on the other hand, it would increase competitiveness of exports in the medium to longer term. In this respect, a country with an export

98 See E. Olaberria, “Capital inflows and booms in assets prices: Evidence from a panel of countries”, *Central Bank of Chile Working Paper* 675, 2012.; K. Aoki, G. Benigno and N. Kiyotaki, “Capital flows and asset prices”, *NBER International Seminar on Macroeconomics* 2007, University of Chicago Press: 175–216; Harold A. Vasquez-Ruiz, “The Link Between Foreign Capital Flows and Housing Prices: A panel data estimation”, *Banco Central de la Republica Dominicana*, 2012

99 See Lloyds International Global Housing Market Review at http://www.lloydsbankinggroup.com/globalassets/documents/media/press-releases/lloyds-bank/2012/1703_global.pdf

Box 2: Unwinding of monetary policies in the developed world and impact on EMs

Part 2, Chapter 1 outlines how extraordinary monetary policies in the developed world have supported economic recovery on the one hand, and a return of high leverage to the financial system on the other. Another consequence of this low interest rate environment has been the surge of capital inflows into EMs.

Eventual normalisation of monetary policy in advanced countries will have spill over effects on EMs, especially those dependent on foreign financing. Last year there were several related developments that affected financial markets. Firstly, the Bank of Japan (BOJ) unveiled its monetary stimulus program. At its April meeting, the BOJ promised to double the monetary base over two years by buying long term government bonds. The aggressive monetary easing program adopted by the BOJ, caused depreciation in the Yen and a rally in stock prices.

Other major central banks took similar liquidity supporting measures. The US Federal Reserve continued with its \$85 billion monthly bond purchase program and the European Central Bank cut its policy rates by 25 basis points on both May and November. With yields in developed markets pushed down to historical lows, investors continued to seek out yields, by either pouring into higher yielding (and therefore riskier) assets and/or diverting attention towards the more growth-positive EMEs.

In May 2013, during his testimony to US Congress on 22 May, Federal Reserve Board Chairman Bernanke, hinted at the tapering of monthly bond purchases. This signal of withdrawal from extraordinary monetary policies was the start of a major realignment in the world financial markets.

In September, the US Federal Reserve revisited its tapering announcement, deciding to postpone the reduction in the bond purchasing program until it received more evidence of strengthening economic data. This surprise caused an appreciation in asset prices. In December, the US Federal Reserve provided clarity by beginning the tapering of asset purchases by \$10 billion to \$75 billion per month. On the back of this, it was announced that the Fed would pursue further reduction if labour market conditions and the inflation outlook improved as expected.

As a result of this move towards tapering, late 2013 witnessed a “bond sell-off” in the developed world as fear over rising interest rates and thus depreciation in bond prices drove investors to redeem bond funds.¹ Emerging market equity and bond funds also experienced steep sell-offs. Immediately afterwards, data from EPFR² revealed billions of dollars of outflows from emerging market bond and equity funds.³ EMs with large fiscal and current account deficits and high inflation were hit hardest.

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- 1 See Rohini Tendulkar and Gigi Hancock, “Corporate Bond Markets: A Global Perspective”, *IOSCO Research Department Staff Working Paper*, April 2014
 - 2 EPFR Global is a data provider that provides fund flows and asset allocation data.
 - 3 See Jerome Powell, “Advanced Economy Monetary Policy and Emerging Market Economies.” *Speech at the Federal Reserve Bank of San Francisco 2013 Asia Economic Policy Conference*, San Francisco, 4 November 2013

orientation could, at least partially, compensate the outflows of international investors with inflows from international commercial activity.¹⁰⁰

With respect to interest rates, capital outflows could put pressure on local interest rates for both the government and the private sector, since a natural response of the

country could be to increase interest rates to reduce the outflows.¹⁰¹ If capital outflows are due to higher interest rates in developed markets, then financing through international markets would become more expensive for EMs. A loss of access to international funding would restrict borrowing opportunities in EMs, leading to slowing economic growth.¹⁰²

If a reversal of capital flows to EMs was to coincide with already slowing growth in the region, the impacts could be compounded. EMs with a big export sector depend on growth in advanced and

100 Additionally, countries with flexible exchange rate systems are more able to dampen such movements of the exchange rate. For example, Jongwanich and Kohpaiboon analyse empirically the impact of capital flows on the exchange rate of some emerging economies of Asia between 2000 and 2009. See J. Jongwanich and A. Kohpaiboon, “Capital flows and real exchange rates in emerging Asian countries”, *Journal of Asian Economics*, 138-146, 2013. The authors confirm the findings of Combers et al. J.-L. Combes, T. Kinda and P. Plane, “Capital flows, exchange rate flexibility, and the real exchange rate”, *Journal of Macroeconomics*, 1034-1043, 2012 and show among other things, that portfolio investments lead to faster adjustment on exchange rate than direct investment and that capital outflows may generate a bigger correction on the exchange rate than inflows.

101 For example through a monetary policy response if the outflows cause inflationary concerns due to exchange rate depreciation.

102 IMF, *Global Financial Stability Report*, April 2012: if total net inflows to EMs from 2009-2011 reversed over one quarter, credit growth would decline 2 to 4% and GDP would fall 1.5 to 2% on average.

other emerging countries. Consequently, an uptick in growth of developed market economies will have a positive effect on flows to these economies and may offset (at least partially) the outflows due to an end to the search for yield environment.

However, for the commodity producing countries, factors such as economic growth in China and the price of oil will be a leading factor. The increase in trade exposure of EMs to China is noteworthy. Recent research suggests that the effective trade exposure of Asian EMs to China is the highest, followed by Latin American EMs and MEA.¹⁰³ As such, slower growth in China will impact the growth of these exposed EMs. Furthermore, developments such as the shale gas revolution could put downward pressure on oil prices, dampening growth in oil-producing EMs such as those in MEA. A report from the IMF notes that commodity prices are not expected to maintain at their recent highs.¹⁰⁴

Slowing growth can provide incentives for countries to depreciate currencies, which as discussed can heighten inflation.¹⁰⁵ At the same time, slowing growth can reduce expected investment returns in EMs, accelerating the reversal of capital flows. The heightened inflation of these already slowing EMs would make them more vulnerable to a reversal of capital flows. If monetary policy is put in place to stem inflation, it may slow growth further – leading to a cyclical problem.

Assessing the risks

The Tapering Test

The potential for a reversal of capital flows to EMs and associated impacts has already been tested to some extent with the tapering announcement of the US Federal Reserve in May 2013. After the May 2013 tapering announcement, the yield of 10 year US Treasury bonds increased to 3% from 1.6%.

EMs varied in their reaction to the announcement of tapering from the Fed. The tapering announcement had a dampening effect on some emerging market inflows, particularly in emerging Asia and Latin America, and as a result their currencies depreciated. By mid-2014, markets had calmed. Most volatility observed at the beginning of 2014 was related to idiosyncratic risk (i.e. local conditions).

Taking some emerging economies (Brazil, India, Mexico, Russia, and Turkey) by way of illustration, we can observe that most exchange rates depreciated during 2013, and continued this trend into 2014 (see Figure 89). However, since February the currencies of Brazil, India, Mexico and Turkey have appreciated. Compared to the January 2013 level, the Mexican peso has remained more stable than other currencies, while the Russian rouble and the Turkish lira have an accumulated depreciation of around 15%, and Brazil's and India's currencies have depreciated around 10%.

Figure 90 shows the behaviour of interest rates of seven emerging economies. Since 2008, there has been a downward trend in short term rates, but with some increases since 2013, and a spike after the announcement from the US Federal Reserve in December for some EM countries.

Long-term rates have also increased for emerging markets, but most of them follow the behaviour of the U.S. interest rates. Figure 91 displays the yield on the 10-year government bonds of some of the emerging economies, for comparison with the U.S. 10-year Treasury note, as a reference. Emerging market country bond yields increased after the May 2013 tapering announcement. Emerging market countries yields increased again at the beginning of 2014. Yet, idiosyncratic risk was influential in the most affected countries during this time.

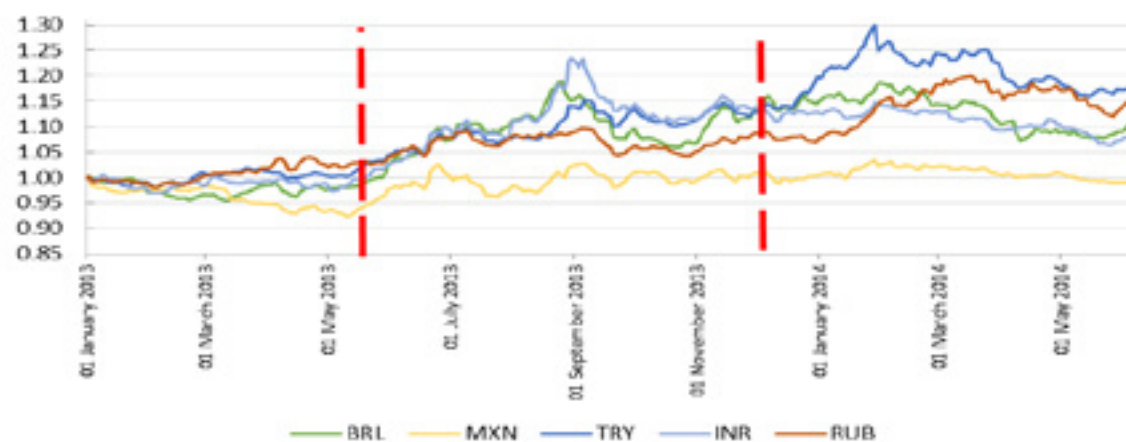
The stock markets in emerging markets had a lacklustre performance in the second half of 2013. A number of EMs saw their main equity index decline after the tapering announcement, a trend that continued through 2013. The exception was India, with strong recovery. Poland, South Africa and Hungary mirrored advanced economies performance in 2013, upon the expectation of

103 Goldman Sachs Global Investment Research: *Emerging Markets: EM Macro Daily – EM exposure to China's growth spillovers*, October 10, 2013; JP Morgan Research, *Global spillovers from China*, February 1, 2014. JPM notes: A 1%-pt slowing in China GDP growth is estimated to dampen growth in the rest of the EMEs by 0.73%-pt over four quarters.

104 IMF, *Emerging Markets in Transition: Growth Prospects and Challenges*, April 2014

105 See Fernando Nechio, "Fed Tapering News and Emerging Markets", *FRBSF Economic Letter*, March 2014

FIGURE 89: DAILY VARIATION OF NOMINAL EXCHANGE RATES – SELECTED EMS

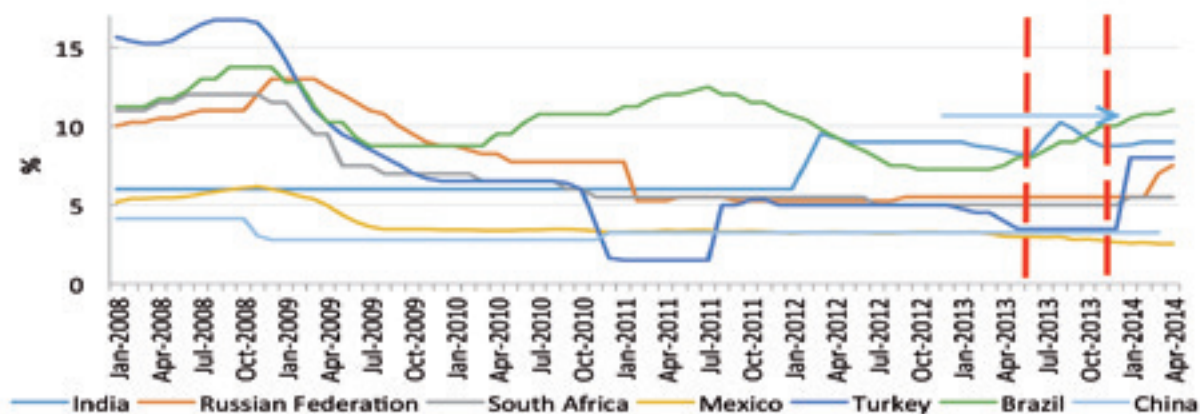


Source: BIS

Note: Red lines coincide with US announcement and tapering.

Note 2: BRL – Brazil, MXN – Mexico, TRY – Turkey, INR – India, RUB – Russia

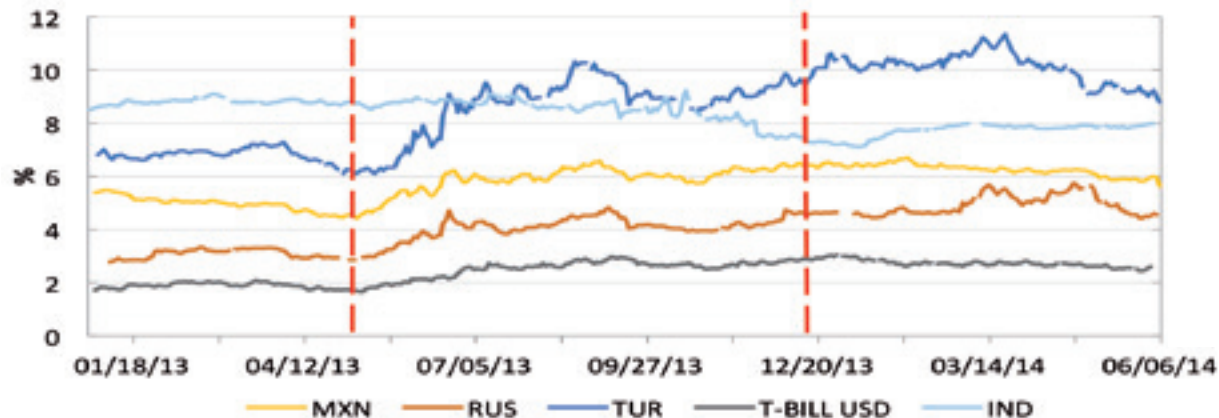
FIGURE 90: SHORT-TERM YIELD ON BONDS



Source: IMF.

Note: Red lines coincide with US announcement and tapering.

FIGURE 91: YIELDS ON 10-YEAR GOVERNMENT BONDS



Source: Bloomberg

Note: Red lines coincide with US announcement and tapering

recovery of the global economy (see Annex 1, Figure 111). The Emerging Market MSCI index shows a clear downward trend after the tapering announcement and again after tapering began in December (see Figure 92). However by mid-2014, stock prices showed comeback.

Bond prices also dropped after the initial taper announcement but recovered strongly after the beginning of the taper in December 2013 (Figure 93). This boom in bond prices in emerging markets reflects lower expectation on US interest rates vis-à-vis the attractiveness of return offered by emerging markets' bonds.

For example, the decline in 10 year US Treasury bonds during the first half of 2014 supported the rally in emerging market assets.¹⁰⁶ The weakness in the US economic data due to extremely cold weather conditions during winter contributed in part to the decline in US bond yields.

The rebound in bond and stock prices may be due to strong continued demand for emerging market assets, the shift of some international investors across assets and expectations of European Central Bank easing.

As for the country risk, Figure 94 shows the spreads on CDS on sovereign debt for some emerging markets. Since mid-2013, the volatility of CDS increased for Brazil, Russia and Turkey. There were changes in the country risk of these economies that occurred at different moments, and that were not necessarily directly related to the tapering. Also, it is worth noticing that for Brazil, China, Turkey and Mexico the CDS spreads have been decreasing since January 2014.

Other factors to consider

Assuming US interest rates rise in the near-term, the full effects of a changing interest rate environment will be more evident. In this context, the amount of activity and sophistication of financial markets;¹⁰⁷

macro factors such as the status of credit build-up, external debt and current account balances;¹⁰⁸ as well as regulation and policy controls used, could limit or aggravate the impacts of a reversal of capital flows.¹⁰⁹

Current account deficits are generally financed by foreign capital inflows and involve increased reliance of economies on these flows.¹¹⁰ If these flows were to suddenly reverse and economies were to shrink, some emerging economies may struggle to finance their activities and debt. Figure 95 shows varying levels of improvement and deterioration of current account balances across EMs. For Morocco, South Africa, Lebanon, Peru, Turkey and Ukraine, the current account deficit was 5% or more of GDP in 2013. However, there has been some improvement in a few economies as a result of depreciation in local currencies and actions taken by national authorities.¹¹¹ Oil exporting Middle East countries and emerging markets in Asia region generally have current account surpluses.

A number of EMs have experienced especially steep credit build-up over the last decade; despite

108 A reversal of inflows is usually accompanied by a forced reduction in domestic demand, as the money needed to finance consumption and investment is no longer available. Those economies with high current account deficits and increasing share of sovereign bonds owned by foreigners (external debt), especially short-term in nature, would be most exposed to a sudden reversal of capital flows. See IMF Working Paper, "Surging Capital Flows to Emerging Asia: Facts, Impacts and Responses", May 2012: <http://www.imf.org/external/pubs/ft/wp/2012/wp12130.pdf>; Rudiger Ahrend and Antoine Goujard, *Global Banking, Global Crises? The Role of the Bank Balance – Sheet Channel for the Transmission of Financial Crises*, 2014

109 See J. Frankel and A. Rose, "Currency Crashes in Emerging Markets: An Empirical Treatment", *JIE* 41(3/4), 1996; G. Kaminsky, S. Lizondo, and Carmen Reinhart, "Leading Indicators of Currency Crises", 1998; G. Kaminsky, and Carmen Reinhart (1999); J. Frankel and G. Saravelos, "Are Leading Indicators Useful for Assessing Country Vulnerability? Evidence from the 2008-09 Global Financial Crisis," *JIE* 87, no.2, July 2012; Also the US Federal Reserve, in its *Monetary Policy Report* (February 2014), constructed a vulnerability index for emerging markets based on six indicators, which included: ratio of the current account balance to gross domestic product (GDP); the ratio of gross government debt to GDP; average annual inflation over the past three years; the change over the past five years of bank credit to the private sector as a share of GDP; the ratio of total external debt to annualised exports and the ratio of foreign exchange reserves to GDP.

110 Jay Bryson and Mackenzie Miller, *Developing Economies and Crisis Vulnerability*, Wells Fargo Securities, October 2013

111 The improvement in current account deficits in emerging markets comes from either an increase in exports or decrease in imports. Although there are regional and country specific factors, it is generally more difficult for emerging market to increase their exports. As a result import decrease is the most important channel for improving current account deficits.

106 Despite Federal Reserve continued tapering, the yield of 10 year Treasury bond, which was close to 3% at the beginning of 2014, declined to below 2.5% by mid-2014.

107 Less sophisticated financial markets could signal a low absorptive capacity of EMEs in the face of increased liquidity, raising their vulnerability to disruption caused by speculative money flows and portfolio investment.

FIGURE 92: STOCK PRICES – MSCI INDEX



Source: Bloomberg

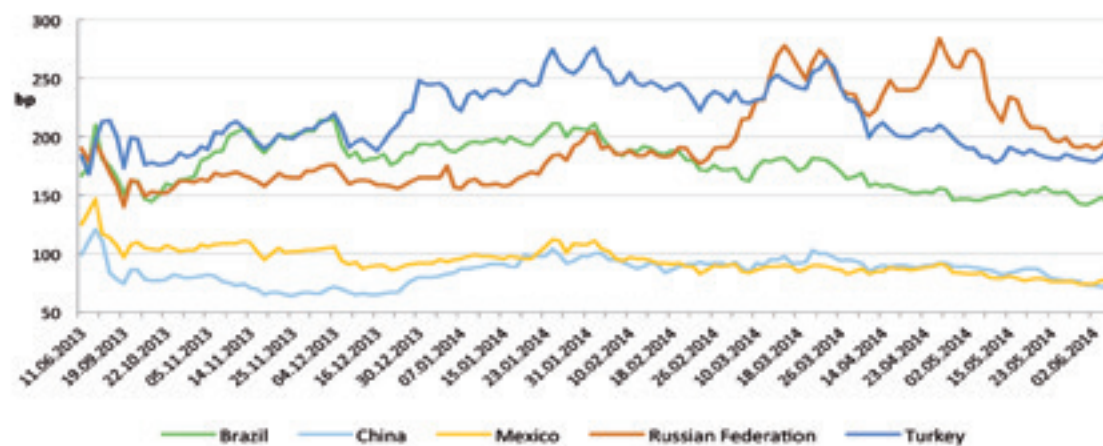
Note: Data normalised from end 2012.

FIGURE 93: BOND PRICES – ADVANCED AND EMERGING ECONOMIES



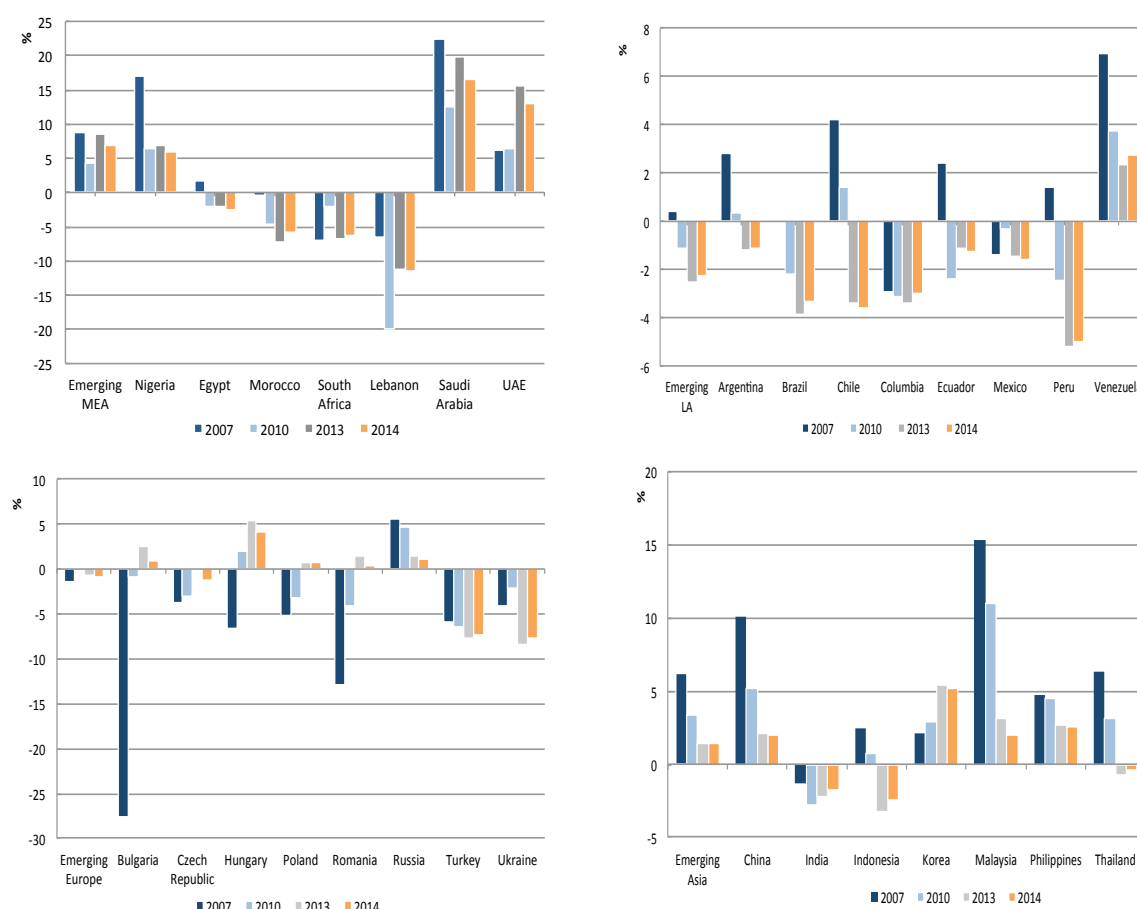
Source: Bloomberg

FIGURE 94: CDS SPREADS FOR SELECTED EMERGING MARKETS



Source: Bloomberg

FIGURE 95: CURRENT ACCOUNT BALANCE AS % OF GDP - FOR SELECTED EMS



Source: IIF, May 29 2014

the dampening effect of the 2008 financial crisis (see Figure 96). In the entire sample of emerging countries, credit build-up in the non-financial sector has been universally upward trending. Rapid credit build up often occurs as lending standards are relaxed. Yet, if capital flows were to suddenly reverse and currencies were to depreciate, some debtors may be unable to service their debt, with ripple effects on their economies.¹¹²

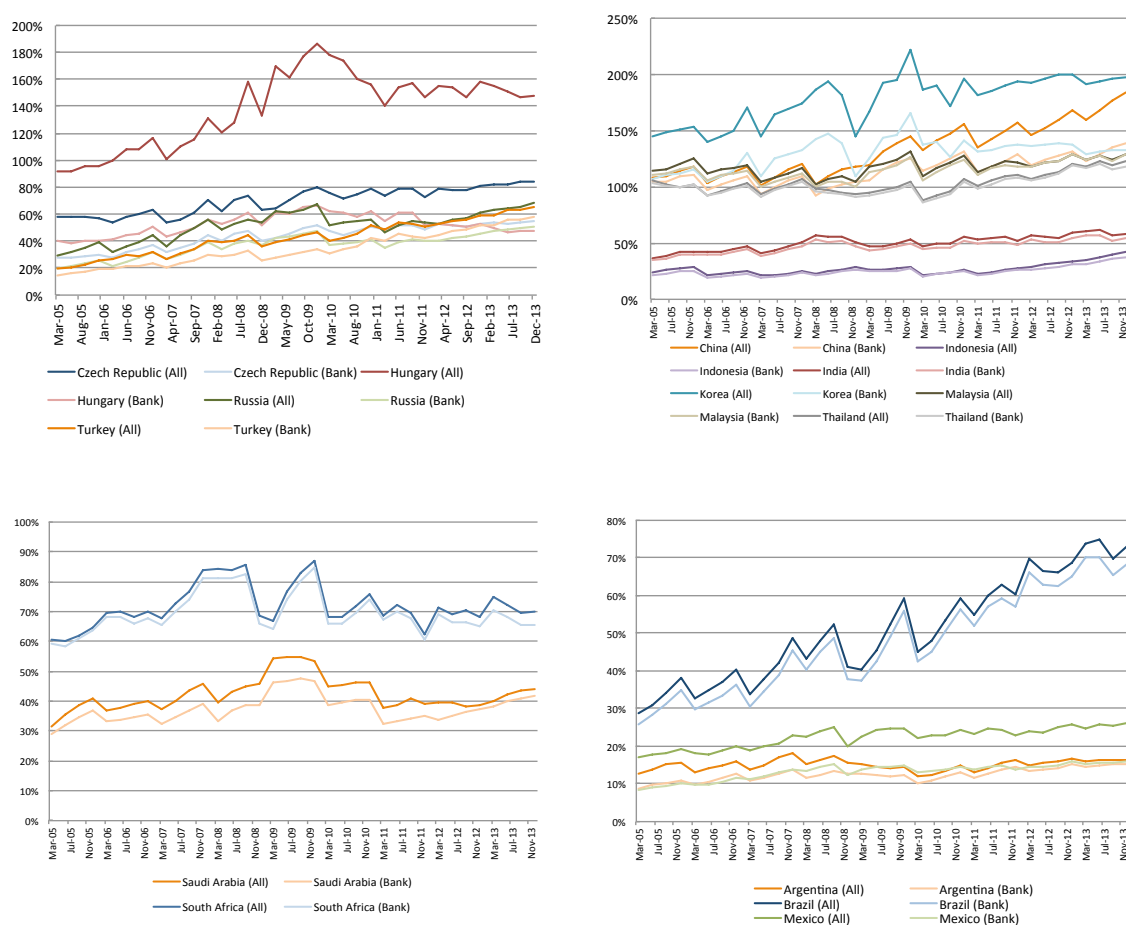
Bank credit provision to the non-financial sector more than doubled between 2007 and 2013 for Argentina, Brazil, Russia and Turkey; and more than tripled for China and Indonesia. In terms of GDP, by the end of last year, credit provision to the non-

financial sector in China equalled 184% of GDP (as compared to 138% of GDP for the banking sector). In Korea credit provision to the non-financial sector equated to almost 200% of GDP (128% of GDP for banking sector). In emerging Europe, credit provision to the non-financial sector in Hungary reached 147% of GDP in 2013 (50% of GDP for banks). In emerging Latin America, provision reached 78% of GDP in Brazil (68% of GDP for banks).

A number of EMs also exhibit reducing total reserves to external debt ratios. In Figure 97, only a few economies such as Saudi Arabia, Malaysia, China and Thailand have reserves valued at greater than their external debt. A low total reserve to external debt ratio can suggest increased exposure to

112 Jay Bryson and Mackenzie Miller, *op cit*

FIGURE 96: CREDIT PROVISION TO NON-FINANCIAL SECTOR AS A % OF GDP – SELECTED EMS



Source: BIS, IIF.

exchange-rate and rollover risk. Ukraine, Argentina, Ecuador and Venezuela all have ratios less than 0.2 – in other words, their total reserves cover less than 20% of their external debt.

At the same time, economic growth across EMs is slowing. Declining growth prospects in emerging markets¹¹³ and a strengthening in developed market economies (see Figure 98) may impact the attractiveness of EMs as an investment destination.

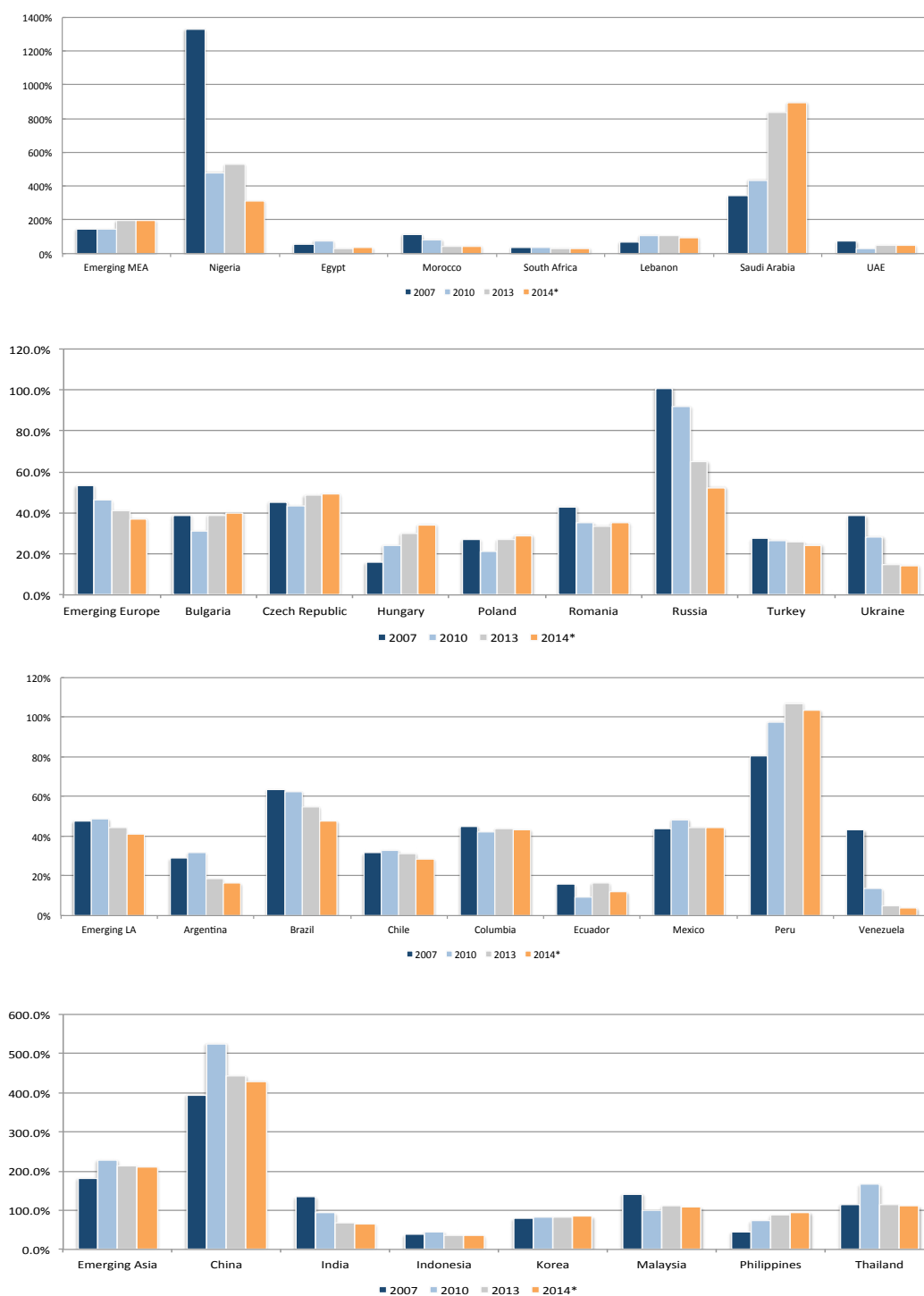
This growth slowdown is most likely due to normalisation of domestic demand¹¹⁴ and China's growth slowing to more sustainable levels.¹¹⁵ Nevertheless, concerns regarding China's economic outlook and slowing growth in some EMs has stoked concerns about the sustainability of EM financial stability.

¹¹³ The yearly growth in emerging markets as a group was 7.7% on average during the 2003 to 2007 period. In this period advanced economies also had high growth, there was a commodity boom and global liquidity was abundant. The average yearly growth retraced to 4.5% during crisis period between 2008 and 2009. Nevertheless the growth in emerging markets bounced back to 7% between 2010 and 2011. However, after the bounce back from the crisis period, we again see slowdown in emerging market growth.

¹¹⁴ Kalpana Kochbar, "Emerging Markets: Prospects and Challenges", IMF, October 2013

¹¹⁵ IMF, *World Economic Outlook*, February 2014 revealed that China's slowdown accounted for a quarter of a 2 percentage point decline in average EM growth since 2012.

FIGURE 97: TOTAL RESERVES AS A % OF TOTAL EXTERNAL DEBT- SELECTED EMS



Source: IIF, May 29 2014

Note: Total Reserves excluding gold

Box 3: Political risks in EMs

Political risk is a key factor investors consider before investing in EMs. Sometimes it can be related to election cycles and geopolitical issues.

Election cycles have tangible impacts on markets. Investment decisions may be postponed after elections and in some cases markets may react negatively to the outcome of an election. 2014 had a tight election cycle and led to outflows from some EMs.

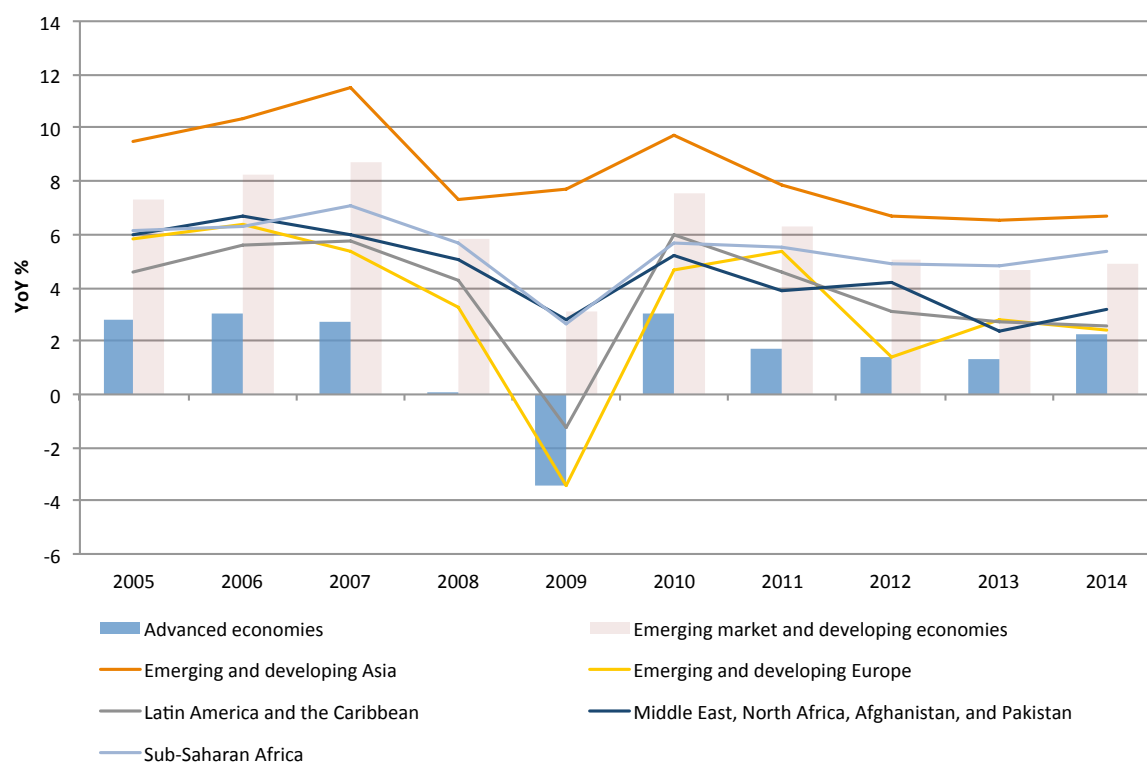
In Turkey the election process coincided with negative sentiment towards EMs at the beginning of 2014. The elections were completed on 25 March and subsequently markets recovered. In India, the victory of the BJP party and its promise of economic reform positively affected the market, with stocks rising and appreciation of the rupee. Further elections are anticipated for this year, at the time of writing. In Indonesia on 9 July 2014; Parliamentary and presidential elections on 5 October in Brazil; and presidential elections in Turkey on 10 August 2014.

Geopolitical risks also heightened in 2014. The year began with military escalation between Ukraine and Russia. This development has had direct effects on the economies of both countries as currencies of Russia and Ukraine depreciated, interest rates rose and stock indices declined. A recent report by the International Institute of Finance highlights how the Ukraine crisis has negatively affected capital flows to Russia.¹ For example, in 2014 Q2, Thailand also endured political instability.

Idiosyncratic political risk may be a strong differentiating factor amongst EMs.

¹ International Institute of Finance, Capital Flows to Emerging Markets, 29 May 2014

FIGURE 98: GDP YOY % CHANGE



Source: IMF

Other factors to consider are:

- > pockets of instability emerging around the world (see Box 3). During periods of conflict or geopolitical instability, global financial markets may see a flight to safe havens. As such, flows to EMs, including those not entangled in instability, may be negatively affected; and
- > securities markets regulation and policy controls put in place in each EM. Considering the increase in securities markets-related flows to EMs, understanding how the policy environment is assisting in developing local securities markets (so as to decrease their reliance on foreign flows) and mitigate the impacts of a reversal of bond and equity flows would be an important element in assessing the risks.

Looking Forward

It seems likely that EMs that exhibit: robust policy framework; more developed securities markets; political stability and strong fundamentals will be best prepared to weather a reversal of capital flows. While currencies are appreciating and country risk seems to be declining in several emerging economies in the wake of tapering in developed economies, the increase in deficits and reliance on external debt signals some vulnerability to a reversal of capital flows.

Probably the greatest risk for emerging economies is to lose momentum in growth, due to internal factors (such as competitiveness) or to their trade and economic links with developed and other developing countries (such as China). Such a loss in growth could have domino effects through local economies. Given the increasing interconnectedness of the financial system, this could impact the wider global economy.

Nevertheless, compared to the past, such as prior to the Asian financial crisis of 1997, a number of EMs are now better prepared for a reversal of capital inflows and have put in place various controls and have much higher reserves.¹¹⁶ In order to understand

the role of these measures in mitigating the systemic risk aspects of a reversal of capital flows, identification of policy controls being employed by EM economic authorities and securities markets regulators would be a useful step. Also, securities markets regulators in EMs will need to contribute through their regulatory and supervisory action to deepening the securities markets and to boost the resilience of their markets to a shift in capital flows.

116 The Federal Reserve Board, *Capital Flows to Emerging Market Economies: A Brave New World*, June 2013: “in response to the sharp rebound in capital flows after the global financial crisis, policymakers allowed some currency appreciation but also intervened in foreign exchange markets to partially stem currency

appreciation pressures; several of them introduced some capital controls and macro prudential measures; and they eased somewhat on policy rate increases needed to stabilise their economies.” (pg. 6)

Chapter 3: Risks in Central Clearing

One of the most significant reforms to the financial markets was the requirement for all standardised over-the-counter (OTC) derivatives contracts to be cleared through a central counterparty (CCP). Wider use of CCPs for OTC derivatives has the potential to reduce systemic risk by, among other things, increasing transparency in traditionally opaque OTC markets and reducing counterparty risk. Though CCPs have been around for many years, including as far back at the eighteenth century,¹¹⁷ the ongoing reforms of the past six years mean that in some jurisdictions, central clearing for OTC derivatives is operational in some form.¹¹⁸

To promote global harmonisation and to further strengthen existing international standards including around CCPs, the CPSS-IOSCO “Principles on Financial Market Infrastructures” were developed in 2012. The purpose is to promote “*enhance[d] safety and efficiency in payment, clearing, settlement, and recording arrangements, and more broadly, to limit systemic risk and foster transparency and financial stability*”.¹¹⁹ Further, at the international level, work continues on many policy fronts related to derivatives markets reforms (See Annex).

In light of these reforms, much has been written about the changing nature of the derivative markets, including in the *IOSCO Securities Market Risk Outlook 2013-14*. The previous Risk Outlook pointed out several areas to be aware of including: competition on collateral, interlinkages with the banking system, and similar risk model usage among CCPs. This edition focuses on other issues for consideration.

Pro-cyclicality of margins and potential liquidity spiral

Margin refers to the requirement that a participant provides collateral to protect against a certain amount of risk. Margin is one of the most common risk-management tools used by counterparties to

OTC contracts as well as CCPs to limit their credit exposure. Margin typically takes the form of money, securities, or other property posted by a party to a swap to cover potential future exposures arising from changes in the market value of the position.

For centrally cleared derivatives, the explanatory notes for the PFMI explain that CCPs are required to collect margin “*to assure performance and to mitigate its credit exposures for all products that it clears if a participant defaults*.”¹²⁰ The explanatory notes also point out that a CCP’s margin system should establish margin levels commensurate with the risks and particular attributes of each product, portfolio, and market it serves.¹²¹ Thus, in times of higher volatility, margin requirements would be expected to be higher to address the increased risk posed to the CCP. If a CCP’s margin model is insufficiently sensitive, increased volatility could lead to uncovered risk.

In general, margin requirements can be higher in times of high volatility/uncertainty and lower during times of stability. This dynamic can exacerbate stress, since more collateral would be required specifically at a time when that collateral may be difficult to find or hard to price.¹²² During the 2008 financial crisis, the potential pro-cyclical impact of margin in the non-cleared OTC derivatives markets became clear. In the run-up to the crisis, financial markets experienced an increase in the amount of leverage in the system (see *Chapter 1*). Coupled with this development, was the increase in the availability of secured financing and rising volumes of trading in OTC derivatives; both with lowering haircuts which again increased implicit leverage in the system. When the crisis materialised in 2008, deleveraging occurred, leading to a pro-cyclical margin spiral (see Figure 99).

Margin requirements also have the potential to cause pro-cyclical effects in the cleared markets.¹²³

117 P. Norman, *The Risk Controllers*, 2012, p. 54.

118 For a more in depth discussion of the government level reforms that have taken place in individual FSB and G20 jurisdictions, see FSB, *OTC Derivatives Market Reforms – Seventh Progress Report on Implementation*, April 2014

119 CPSS-IOSCO, *Principles for Financial Market Infrastructures*, 2012

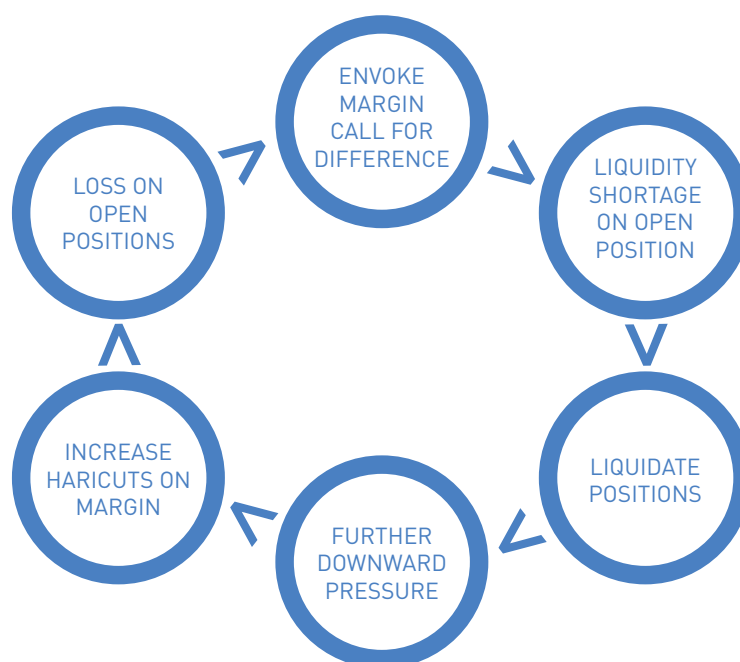
120 See CPSS-IOSCO, *Principles for Financial Market Infrastructures*, 2012, Principle 6, Explanatory note 3.6.1.

121 *Idem* Principle 6, Explanatory note 3.6.2: “margin requirements need to account for the complexity of the underlying instruments and the availability of timely, high-quality pricing data. For example, OTC derivatives require more-conservative margin models because of their complexity and the greater uncertainty of the reliability of price quotes.”

122 C. Pirrong, “The Economics of Central Clearing – Theory and Practice”, *ISDA Discussion paper series*, 1/2011.

123 D. Heller & N. Vause, “Expansion of Central Clearing”, *BIS Quarterly Review* 2/2012; N. Kamhi, “Pro-cyclicality and margin requirements”,

FIGURE 99: ILLUSTRATIVE EXAMPLE OF A MARGIN SPIRAL



Source: IOSCO Research Department

Specifically, Principle 6 of the PFMI, states that CCP's margin models should *"to the extent practicable and prudent," limit the need for destabilising, procyclical changes.*"¹²⁴

Developing a framework for understanding how margin requirements for products cleared by a particular CCP may vary with the business cycle requires considering a number of related issues. The first is the model used by the CCP to measure the financial risks that margin requirements are meant to cover. Annex 3 includes a selected list of CCPs and the models that they use to calculate margins. While on first examination the list complex, all of these models are designed to capture market risk associated with cleared portfolios, and only differ in the

statistical methodology and specific variables used to calculate margin requirements.

While a CCP's choice of model reflects a choice of assumptions in fixing clear relationships between input variables and margin requirements, each CCP also retains flexibility in choosing how to implement its margin model. Choices related to implementation can affect intertemporal variation in margin levels as well as the relationship between margin requirements and the business cycle. For example, a CCP may choose to model risk exposure using a VaR model that uses parameter estimates based on historical data. The CCP may subsequently decide to implement this model by applying a weighting function to historical data to weigh more recent data more heavily. Such decisions reflect distinct sets of associated assumptions and one analysis suggests that they may lead to procyclical margin requirements.¹²⁵ Moreover, a CCP may exercise discretion in its implementation of a margin model: a CCP may choose to employ a

Bank of Canada Financial System Review 2009; ICMA: Do haircuts/ margin exacerbate pro-cyclicality?

The PFMI explain that, in the context of margin arrangements, "procyclicality typically refers to changes in risk-management practices that are positively correlated with market, business, or credit cycle fluctuations and that may cause or exacerbate financial instability." CPSS-IOSCO (2012): "Principles for Financial Market Infrastructures", Principle 6, Explanatory note 3.6.10.

124 CPSS-IOSCO, *op. cit.* Principle 6, Key consideration 3.

125 D. Murphy; M. Vasios, and N. Vause, "An investigation into the pro-cyclicality of risk-based initial margin models", *Bank of England Financial Stability Paper No. 29*, 2014.

Standard Portfolio Risk Analysis (SPAN) model while subjectively altering cyclicity of margin requirements by adjusting model parameters.

According to the PFMI, a CCP's margin system is expected to establish margin levels commensurate with the risks and particular attributes of each product, portfolio, and market it serves.¹²⁶ In addition, and pursuant to the PFMI, a CCP should monitor its model's performance and overall margin coverage by conducting rigorous back testing and sensitivity analysis.¹²⁷ A CCP is also expected to regularly conduct an assessment of the theoretical and empirical properties of its margin model for all products it clears.¹²⁸ In conducting sensitivity analysis of the model's coverage, a CCP is expected to take into account a wide range of parameters and assumptions that reflect possible market conditions, including the most-volatile periods that have been experienced by the markets it serves and extreme changes in the correlations between prices.¹²⁹ Thus, the explanatory notes to the PFMI suggest that *"to the extent practicable and prudent," "a CCP should adopt forward-looking and relatively stable and conservative margin requirements that are specifically designed to limit the need for destabilising, procyclical changes."*¹³⁰ One method of supporting this objective, described in the explanatory notes of the PFMI, is for a CCP to *"consider increasing the size of its prefunded default resources in order to limit the need and likelihood of large or unexpected margin calls in times of market stress."*¹³¹

Certain regulations try to address the risks of procyclicality. For example, EMIR outlines several areas where CCPs can act to mitigate against procyclicality, including:

126 *Idem*, Principle 6, Key consideration 1.

127 *Idem*, Principle 6, Key consideration 6.

128 *Ibidem*

129 *Ibidem*

130 *Idem*, Principle 6, Explanatory note 3.6.10.

131 *Ibidem*. In addition, the Principle 3 of the PFMI states that a CCP should limit pro-cyclicality in its collateral arrangements *"by establishing stable and conservative haircuts"* that are calibrated to include periods of extreme stress in order to limit the impacts of pro-cyclicality. Such concerns are also relevant for non-cleared swaps because, as discussed below, haircuts on financing transactions and initial margins on OTC derivatives can have a similar effect of adding liquidity to the market in a boom and draining it in times of stress. See also P. Nahai-Williamson, T. Ota and A. Wetherilt, "Central counterparties and their financial resources – a numerical approach", *Bank of England and Financial Stability Paper No. 19*, 2013.

applying a margin buffer at least equal to 25% of the calculated margins which it allows to be temporarily exhausted in periods where calculated margin requirements are rising significantly;

assigning at least 25 % weight to stressed observations in the "look back" period calculated in accordance with specified liquidation; and

ensuring that its margin requirements are not lower than those that would be calculated using volatility estimated over a 10 year historical "look back" period.¹³²

Business capitalisation of CCPs for general business risk

General business risk in CCPs is defined as any potential impairment of the CCP's financial position (as a business concern) as a consequence of a decline in its revenues or an increase in its expenses, such that expenses exceed revenues and result in a loss that must be charged against capital.¹³³ The materialisation of such a risk, whether it be a one-off or a series of smaller losses, can impact the functioning of a CCP, as a growing concern. As such, the business risk principle of the PFMI is intended to cover losses that exceed revenues and result from a decline in its revenues or an increase in its expenses (which losses include losses from poor execution of business strategy, negative cash flows, or unexpected and excessively large operating expenses, as well as losses resulting from investments), but does not cover the loss of a member default.

Based on the information highlighted in Table 5, CCPs can be profitable entities. CCPs are also subject to rigorous financial standards and have access to a variety of financial resources. Pursuant to Principle 15 of the PFMI, financial market infrastructures (FMIs) should maintain liquid net assets funded by equity (common stock, disclosed reserves, or other retained earnings etc.) so that they can continue as a going concern if general business losses are incurred. The actual amount of liquid net assets funded by equity an FMI should hold should be determined by its general business risk profile and the length of time required to achieve a recovery or

132 EU Commission Delegated regulation No153/2013, Article 28 "Procyclicality"

133 CPSS-IOSCO *op. cit.*, Annex H: Glossary

TABLE 5: FINANCIAL RATIOS AND OTHER INDICATORS OF SELECTED CCPS

	OCC	ICE*	LCH~	Eurex
Current Ratio#	1.16	0.96	1.97	1.58
Cash Ratio ##	0.48	0.45	na	na
Total Equity	25	na	na	25
Return on Equity	6%	2%	6%	0.57%
Revenues	na	na	na	101
Net Profit/Income	1	na	na	.40
Net Profit Margin	0.90%	15%	5%	0.79%
Debt / Equity	11	0.77	na	na
Other	2billion line of Credit against default fund	Access to line of credit	Portfolio of insurance for operational losses	Internal transfer agreement

Source: Thomas Murray Data Service

Note: based on CCP self-reported information provided through a CCP Risk Assessment questionnaire; * Entity refers to ICE Clear U.S. and ratios are calculated using the consolidated statements of ICE Group; ~ Entity refers to LCH. Clearnet Ltd; # Current Ratio is defined as an entities current assets over current liabilities and is interpreted as a measure of an entities liquidity or ability to meet its short term obligations; ## Cash ratio is defined as an entities cash (and equivalents) over its current liabilities and is a more conservative estimate on an entities ability to cover short term obligations.

orderly wind-down of its critical operations and services (and projected in its recovery or orderly wind-down plan).¹³⁴

Many CCPs have additional resources to call upon in the event that their pre-funded resources are consumed. For example, Eurex, which is a wholly owned subsidiary of the Deutsche Börse, could rely on the support of its parent company such as through the Profit Transfer Agreement which, is in place to prevent the CCP from becoming insolvent during a default of multiple Clearing Members.¹³⁵ Further, under German regulation, the CCP Eurex Clearing AG is a bank-licensed entity, allowing it access to central bank

facilities. Additionally, CCPs are generally required to have plans in place to address other uncovered losses, including losses resulting from investments and general business risk.¹³⁶ For example, CCPs have extensive credit line facilities in place, in some cases underwritten by the default funds, to provide cover in extreme circumstances, while some may use an insurance portfolio as part of their plan to further manage operational losses. Additionally, in some jurisdictions, CCPs are required to have in place rules for losses that are non-default in nature.¹³⁷

One of the requirements from the new legislation in the EU, the European Market Infrastructures

134 CPSS-IOSCO *op. cit.*, Principle 15, Key Considerations 1. Key Consideration 3 further provides that “[a]t a minimum, an FMI should hold liquid net assets funded by equity equal to at least six months of current operating expenses.”

135 Pg.19 From Eurex Clearing Annual Report 2013 – “As part of the profit transfer agreement concluded between Eurex Clearing and Eurex Frankfurt AG, the former is obliged to transfer its net income for the year to Eurex Frankfurt AG, minus any losses carried forward from the previous year and the amount to be added to the statutory reserves in accordance with section 300 of the AktG. At the same time, Eurex Frankfurt AG is required to make up any losses incurred at Eurex Clearing during the year through loss absorption, provided such losses have not already been made up for by transfer from other retained earnings added during the term of the contract.”

136 See generally Section 3, SI 2013/1908, The Financial Services and Markets Act 2000 (Over the Counter Derivatives, Central Counterparties and Trade Repositories)(No.2) Regulations 2013; 7 C.F.R. 39.39(b)(2); and CFTC regulation 17 CFR 39.39(b)(2), which requires plans for Recovery or orderly wind-down necessitated by general business risk, operational risk, or any other risk that threatens the DCO’s viability as a going concern. See also CPSS-IOSCO *op cit* – Principle 15, Key Consideration 3.

137 For example, in a note to the CFTC, LCH.Clearnet notes that due to changes in the UK CCP Recognition Act, LCH would allocate the first EUR15 million to its own equity resource. Anything over and above this threshold would be allocated to the clearing members of the CCP based on margin rules.

Regulation (EMIR), stipulates ensuring that CCPs have enough capital in order to meet six months of operating expenses, as well as covering operational and legal risks, credit, counterparty and market risk and requirements for business risk.^{138,139} The US CFTC requires Derivative Clearing Organisations (DCOs) to cover one year (on a rolling basis) of operating costs,¹⁴⁰ including six months in highly liquid capital.¹⁴¹

As such, it appears that CCPs have many options available to ensure continuity of operations as a going concern.

Investment policies and collateral acceptance

Concerns have been raised that CCPs may find their interests in growing business and market share to be in tension with the interests of market participants and overall market stability.¹⁴² Macro-prudential regulators, such as the Bank of England, suggest that in an effort to capture more market share from their competitors and to attract more end users, clearinghouses may resort to relaxing margin requirements or to lowering default funds contributions, nullifying the effects of the mutualising loss regimes of the CCP. Regulators should be attentive to these issues to avoid undermining the main principle the CCP was set up for; that is, promoting financial stability in the event of a major counterparty default.¹⁴³

However, there is a theoretical limit to the type of collateral a CCP can accept from clearing members. As discussed in the PFMI, a CCP is expected to hold enough liquid collateral resources to meet counterparty claims in the event of a default.¹⁴⁴ In addition, an FMI is required to set and enforce appropriately conservative haircuts and concentration limits.¹⁴⁵ For example, the EMIR framework (and the related regulatory technical standards) specify the types of collateral that could be considered highly liquid (for central clearing), i.e. cash, financial instruments and gold.¹⁴⁶ EMIR also states that a CCP should not reduce their margins to a level that compromises their safety as a result of the existence of a highly competitive environment.¹⁴⁷ In the US, the Dodd-Frank Act, Securities Exchange Act¹⁴⁸ and CFTC regulations include risk management requirements that, among other things, require a Derivatives Clearing Organisation (DCO) to limit the assets it accepts to those that have minimal credit, market, and liquidity risks,¹⁴⁹ to use prudent valuation practices to value such assets,¹⁵⁰ to apply appropriate reductions in value to reflect credit, market, and liquidity risks to such assets,¹⁵¹ and, as necessary, to apply appropriate limitations or charges on the concentration of such assets in order to ensure the DCO's ability to liquidate the assets quickly with minimal adverse price effects.¹⁵²

Additionally, the issue of collateral that can have potential feedback loops between CCP and CCP clearing members (especially large globally systemically important banks (G-SIBs)), has come under the spotlight. The CFTC does not permit lines-of-credit

138 Official Journal of the European Union (23.2.2013): "COMMISSION DELEGATED REGULATION (EU) No 152/2013 of 19 December 2012 supplementing Regulation (EU) No 648/2012 of the European Parliament and of the Council with regard to regulatory technical standards on capital requirements for central counterparties", Article 1.

139 It must be noted that the above risks relate to risks that are not covered by margin or by the default fund.

140 See Section 725(c)(2)(B) of the Dodd-Frank Act, Pub. L. No. 111-203, 124 Stat. 1376 (2010) (available at <http://www.cftc.gov/LawRegulation/otcderiavtives/index.htm>) (amending Section 5b(c)(2)(B) of the Commodity Exchange Act, 7 U.S.C. 7a-1(c)(2)(B), as implemented by CFTC Regulation, 7 C.F.R. 39.11(a)(2)).

141 See 7 C.F.R. 39.11(e)(2) (requiring DCOs to hold "unencumbered, liquid financial assets (i.e., cash and/or highly liquid securities) equal to at least six months "operating costs").

142 Deutsche Bank Research, *Reforming OTC derivatives markets - Observable changes and open issues*, 2013; T. Koepl, "The Limits of Central Counterparty Clearing: 'Collusive Moral Hazard and Market Liquidity'", *Queen's Economics Department Working Paper No. 1312*, 2013; IMF, *Global Financial Stability Report - making Over-the-Counter derivatives safer: the role of central counterparties*, 2010.

143 Bank of England Financial Stability Report, *Medium Term Risks to Financial Stability*, 2012.

144 Principle 5 of the PFMI provides that an FMI that requires collateral to manage its or its participants' credit exposure should accept collateral with low credit, liquidity and market risks.

145 CPSS-IOSCO (2012): "Principles for Financial Market Infrastructures – Principle 5, Key Considerations 3, 4; CPSS-IOSCO (2013). See, e.g., 7 U.S.C. 7a-1(c)(2)(D) and 7 C.F.R. 39.13(g)(10)-(13).

146 EMIR states that "A CCP shall accept highly liquid collateral with minimal credit and market risk to cover its initial and ongoing exposure to its clearing members. For non-financial counterparties, a CCP may accept bank guarantees. A CCP may accept, where appropriate and sufficiently prudent, the underlying of the derivative contract or the financial instrument that originates the CCP exposure as collateral to cover its margin requirements."

147 EU Commission Delegated regulation No153/2013, para 23

148 See Rule 17Ad-22(d)(3) and proposed Rule 17Ad-22(e)(5) under the Securities Exchange Act.

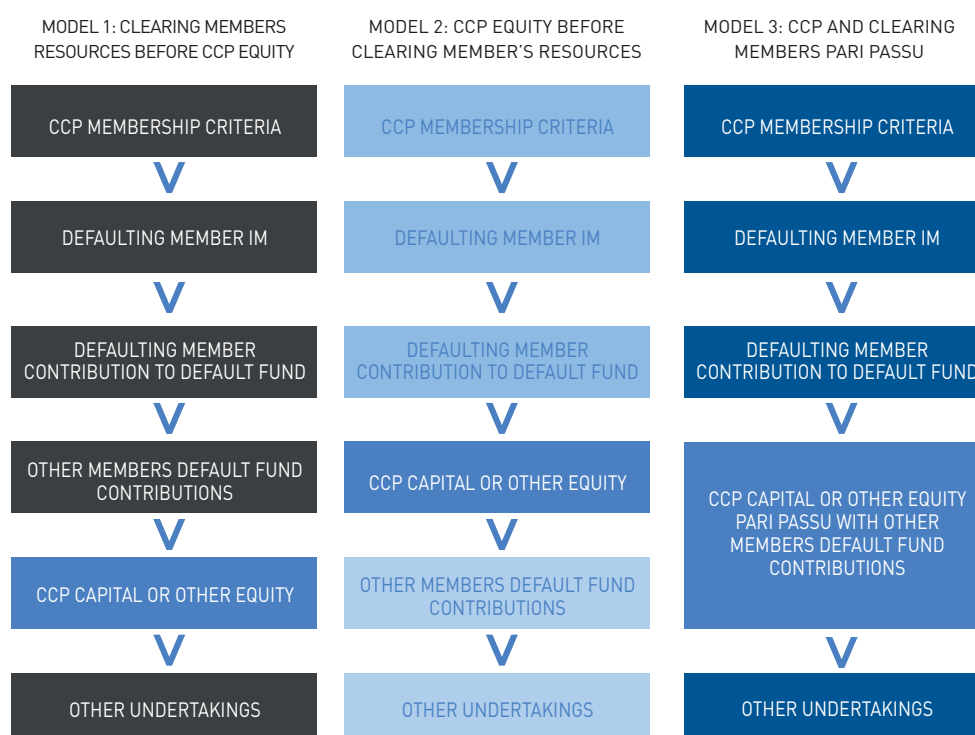
149 See generally 7 U.S.C. 7a-1(c)(2)(D) and 7 C.F.R. 39.13(g)(10).

150 7 C.F.R. 39.13(g)(11).

151 7 C.F.R. 39.13(g)(12).

152 7 C.F.R. 39.13(g)(13).

FIGURE 100: THREE DIFFERENT MODELS OF LOSS ALLOCATION WITHIN A CCP



Source: IOSCO Research Department

or bank guarantees to be used to cover any swap-related margin requirements. EMIR also states that commercial bank guarantees can only be accepted as collateral if they are issued to guarantee a non-financial clearing member. Consequently, some of the collateral announcements seen in the past 12 months are related to the non-acceptance of bank guarantees from 2014 and onwards.

However, there is still a variety of eligible collateral under the PFMI and applicable law that is being accepted by CCPs though a CCP's acceptance of such collateral is frequently subject to concentration limits. Annex 3 provides an overview of the collateral that is being accepted by selected CCPs. There are many benefits to accepting a wider range of collateral. The acceptance of a wider range of collateral will benefit clearing members from the point of view of providing them with a larger pool of securities to post as margin or default fund contribution; in other words, lowering the opportunity cost of placing collateral. Since the last

Risk Outlook, there have been several announcements outlining new asset classes being eligible for initial margin posting (see Annex 3). Many of the collateral changes suggest that the overall risk of the collateral pool is being reduced (for example, bank guarantees no longer being accepted).

"Skin-in-the-game" and the structure of the default waterfall

A CCP typically uses a sequence of prefunded financial resources, often referred to as a "waterfall," to manage losses caused by participant defaults.¹⁵³ In other words, the waterfall is a liability "hierarchy" of how the losses of a defaulting member would be allocated within the CCP structure. It is through this type of hierarchy that the CCP allocates the default risk of its clearing members.

¹⁵³ See CPSS-IOSCO *op. cit.*, Principle 4, Explanatory note 3.4.17, which also states that "the waterfall may include a defaulter's initial margin, the defaulter's contribution to a prefunded default arrangement, a specified portion of the CCP's own funds, and other participants' contributions to a prefunded default arrangement."

Broadly speaking, the structure of the default waterfall can be categorised into three different models as outlined in Figure 100. In each of these models, the first line of defence is through the use of defaulting member's resources to absorb any loss, that is through initial margin (IM) plus its contribution to the default fund pool and any other assets that the defaulter has to which the CCP has access.

The difference in the three models lies in how high in the waterfall the capital of the CCP is allocated if losses are still not covered by other resources. 27 CCPs have a default waterfall where they place their capital resources ahead of non-defaulting clearing members (Model 2 – CCP junior contribution).¹⁵⁴ CCPs may also allocate all or a portion of their capital resources at the same level as the non-defaulting clearing members (Model 3 – CCP *Pari Passu* contribution).¹⁵⁵ By a CCP placing more capital higher up in the default waterfall, non-defaulting members are less likely to be affected by losses caused by another clearing member, which is one of the key rationales for a CCP.

According to its specific waterfalls as outlined in the Thomas Murray CCP Risk Assessment exercise, The Options Clearing Corporation (OCC) and the Korean Exchange (KRX) places their own resources last in the liability hierarchy (Model 1 – CCP senior contribution). It is this specific issue (coupled with initial membership requirements) that is now being debated (See Box 4 for further discussion).

The PFMI provide that CCPs should have effective and clearly defined rules and procedures to manage a participant default. According to the PFMI, these rules and procedures should be designed so that the FMI can take timely action to contain losses and liquidity pressures and continue to meet its obligations. While the PFMI make no specific recommendations as to the model an FMI should

use to allocate the losses of a defaulting member,¹⁵⁶ the extent to which CCPs and members are exposed to losses is likely to affect incentives on both sides.

The design of the default waterfall and the placement of the CCP's contributions therein are likely to influence incentives. There is good reason for a CCP to place its capital ahead of its non-defaulting clearing members. By doing so, the CCPs have proper incentives to ensure that only strong capitalised entities are admitted as members of the clearer.¹⁵⁷ That is, do proper due diligence on credit risk of (potential) clearing members. Determining the amount of capital that is placed, however, is a fine balancing act. The default waterfall acts like insurance. The more CCP capital that is placed senior in the default fund, the more likely the clearing members are going to be indifferent to the counterparty, with the knowledge that any default will be internalised within the CCP and its resources. In other words, it undermines the incentives to do proper due diligence and source proper counterparties, so that in the end, overall default rates may increase.¹⁵⁸ So from that point of view, a model where default fund resources are placed before that of the CCP aligns the practices of clearing members and their own risk management/ due diligence with that of their counterparties.

Looking forward

CCPs have developed business models and risk management procedures that have proved robust. Nevertheless, as the nature of CCP business becomes more complex, through expansion into new markets, and more centralised through consolidation, the systemic importance of CCPs may grow, and it will be important for CCP risk management capabilities to evolve to reflect these developments.

Regulators, additionally, will need to be cognisant of the changing business environment that CCPs operate under, and remain vigilant to any moves in operational standards due to competitive pressures.

154 Thomas Murray Data Services, *CCP in Focus - Skin-in-the-Game – How much skin should a CCP put in, if a CCP puts in Skin?*, 2014

155 See e.g., ICE Clear Credit: Responses to Principle 13 of PFMI Disclosure Framework (available at http://www.theice.com/publicdocs/clear_credit/ICEClearCredit_DisclosureFramework.pdf). ICE Clear Credit's default waterfall contains a junior ICE Clear Credit contribution and a *Pari Passu* ICE Clear Credit contribution that is consumed on a *pro rata* basis with the contributions of the non-defaulting clearing members.

156 CPSS-IOSCO, *Principles for Financial Market Infrastructures, Principle 13: Participant-default rules and procedures*, 2012

157 B. Blais, F. Heider, & M. Hoerova, "Clearing, counterparty risk and aggregate risk", *IMF Economic Review* 60, 2012

158 B. Blais, F. Heider, & M. Hoerova, "Incentive compatible centralised clearing", in *Banque Du France Financial Stability Review, April 2013*, No.17

Box 4: The default of HanMag securities and the KRX

In December 2013, a Korean securities broker, HanMag Securities, defaulted on an automated derivatives trading strategy that had been executed incorrectly. According to the Korean Financial Supervisory Service (FSS), the incident was an execution error on options on the Korean Stock Index, the KOSPI 200. The details of the incident are as follows. On December 12 an order, consisting of both put and call options, was placed for 36,000 KOSPI 200 index options. The purpose of the strategy was to place “in-the-money” call and puts at various strike prices. The trading strategy aimed to take advantage of any mispricing in orders and is similar to buying at limit-low and selling at limit-high.¹ However, the problem occurred when the orders were executed the opposite way around and immediately exercised by the counterparties. It was reported that the losses on the incorrect positions totalled over KRW46.2billion (\$US42 million).² HanMag had to settle losses and other client margin by 4:00pm on the following day but only paid a fraction of the loss.

In the wake of an erroneous derivative trades, the KRX made good on the positions by allocating the losses of the defaulting member to the overall default fund (i.e. other non-defaulting member’s contributions) before any CCP resources were used (though it never reached that stage). The KRX then unwound the HanMag assets and returned the proceeds back to other clearing members. As a result, clearing members were asked to top-up their contributions to the default fund.

This is, however, only part of the story; this particular incident is coupled with CCP membership criteria. Before this particular episode, the KRX had relaxed its capital requirements for membership, reducing them from KRW900million to KRW200million, meaning smaller, less well capitalised entities could become members. HanMag was one of those, a small securities firm with \$US20million in capital that was allowed to execute an open position of over \$40 million.

In the end, it should be noted, the default of the counterparty was contained within the CCP entity with no further contagion effects on the broader financial markets. From this regulatory perspective, the CCP did what it was designed to do; centralise and mutualise counterparty risk and reduce systemic risk. However, the lessons to be learned from this episode are also quite clear; clearing members need to do their proper due diligence on the structure and governance of a CCP, understanding the full implications of the CCP structure so as to better assess the risks it entails for their specific business.

1 Risk.net, *Korea clearing structure in question after HanMag trading error*, 2014

2 Financial Times, *Banks launch clearing review after Korean broker default*, 2014

Chapter 4: The Increased Use of Collateral and Risk Transfer

Last year's Risk Outlook described the risks associated with collateral management in a stressed funding environment. It provided a rough estimate of the availability and use of collateral on a global scale and identified potential risks involved in industry solutions to a possible collateral squeeze – i.e., collateral transformation activities and re-use.

The chapter noted limited data availability and transparency relating to collateral management, and concluded that risk transfer involved in collateral transactions and transformation could be an area where potential systemic risk is building up, especially given the pro-cyclical nature of these activities. This chapter of the Risk Outlook 2014-2015 seeks to build on our previous analysis. Additional data has been gathered to shed further light on the scale of these activities, and experts from the market and the global regulatory community have been interviewed to obtain a more detailed view on risks.

Background

The passage of the Dodd-Frank Act in the US and the European Market Infrastructure Regulation (EMIR) in Europe has changed the collateral landscape in recent years.¹⁵⁹ These regulations require some institutions to increase their holdings of liquid assets (securities or cash) in order to meet initial margin requirement or increase capital ratios on balance sheets.¹⁶⁰ ¹⁶¹ Government bonds are considered an example of a liquid, risk-free asset, even though under Basel rules capital is required to be held against them. Institutions may also need to hold liquid cash to enable them to meet the variation margin of cleared derivative trades. These laws and regulations, coupled with capital-related changes introduced through Basel III and

the EU's Capital Requirements Directive IV, initially led to industry concerns over a potential shortfall in collateral.¹⁶² ¹⁶³ However, recently, concern has shifted away from a potential shortfall of collateral and towards the uneven distribution of collateral across market players.¹⁶⁴

Last year's Outlook showed a relatively balanced development in the supply and demand for collateral. Instead, it focused on activities such as securities lending, repo and collateral management since they can have an important role in providing eligible assets to fulfil collateral needs across the market, on the one hand, but also introduce risks, on the other. Figure 101 shows this in more detail. It highlights the total potential supply of collateral (total lendable assets) and the total amount lent out (total balance on loan), which can be considered a proxy for demand. The data suggests an over-supply of collateral.¹⁶⁵

Figure 102 provides a breakdown of potential collateral supply and demand by type, and region. The data suggest that government bonds and equity are in relatively high demand and supply in each region. Corporate bonds are also in high supply in the Americas, compared to the other regions where supply is almost non-existent (or data is scarce). This may be a product of relatively transparent secondary markets in the US and the large size of the US corporate bond market compared to other jurisdictions.

159 In Europe, demand for "safe" assets will also increase from insurance companies as a result of Solvency II, because debt instruments with high ratings will enjoy a preferential regulatory treatment (CGFS, 2011).

160 Collateral, in the form of sufficiently high-grade liquid securities and/or cash, is required to be posted by all participants to a derivative trades, in order to reduce counterparty risk.

161 Although variation margin (daily payments reflecting changes in the market price of a derivative) will not directly increase collateral demand, it may do so indirectly. This is because market participants are likely to respond by holding additional buffers of eligible collateral to be used in times of heightened market volatility.

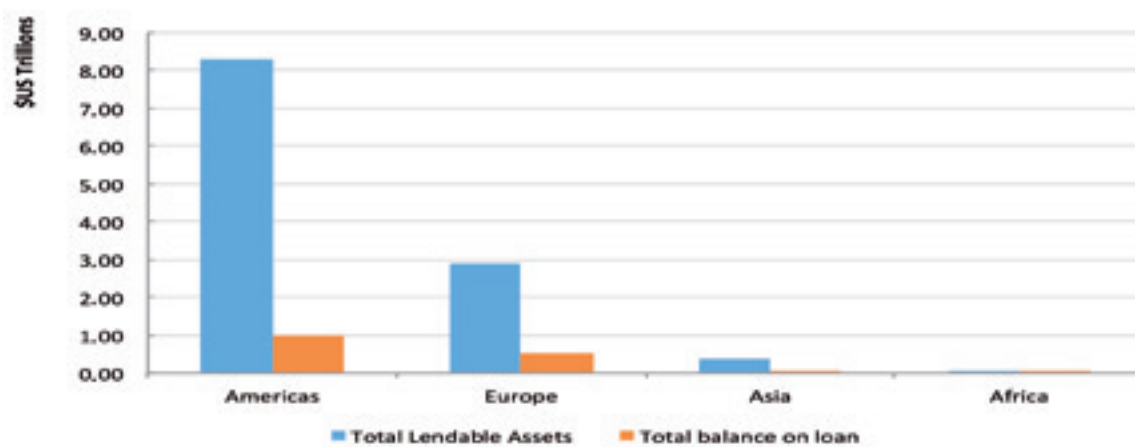
162 See for an overview e.g. James Sweeney, http://treasur.gov/resource-center/data-chart-center/quarterly-refunding/documents/TBAC_Discussion_Charts_May_2013_r-pdf

163 Levels and Capel (2012) comparing the forecasted increases in collateral demand (\$2 trillion) and collateral supply (\$1.1 trillion), conclude that high-quality liquid assets are likely to become more scarce (in relative terms) in the next years. However they don't expect collateral scarcity in absolute terms (total supply in 2014 of \$7.5-8.9 trillion, total demand of \$4.7 trillion).

164 See Ingo Fender and Ulf Lewrick, "Mind the gap? Sources and implications of supply-demand imbalances in collateral asset markets", BIS, *Quarterly Review*, September 2013. They argue that there is not so much a shortfall of collateral, but that collateral is unevenly distributed. Similarly, Ronald Anderson and Karin Joeveer, *The Economics of Collateral*, April 2014, note that while "it is unlikely that there is an overall shortage of collateral... it is quite possible that there may be bottlenecks within the system which mean that available collateral is immobilised in one part of the system and unattainable by credit-worthy borrowers."

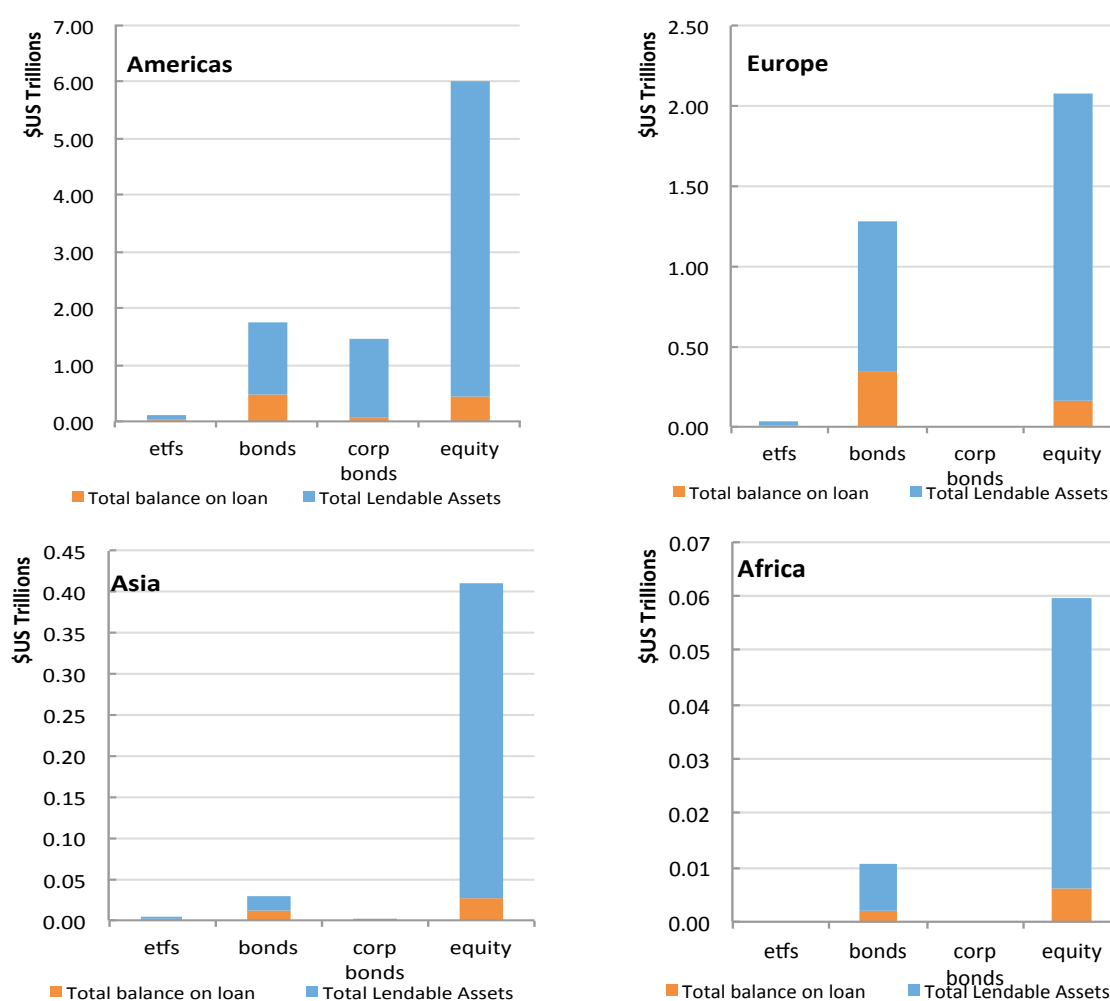
165 The value of lendable securities in the Markit database only reflects securities that are reported to be available by custodians (via their agency lending programs) or by market participants (principal lending).

FIGURE 101: LENDABLE SECURITIES AND BALANCE ON LOAN BY REGION IN 2013



Source: Markit

FIGURE 102: BREAKDOWN OF POTENTIAL COLLATERAL SUPPLY AND DEMAND BY ASSET CLASS



Source: Markit

Note: "bonds" refers to sovereign bonds.

Data gathering of the FSB Shadow Banking Task Force Work-stream 5 (WS5) on securities lending and repo is still ongoing. IOSCO has also launched a data gathering exercise using available annual reports of firms, third party databases, reports by regulators and other financial analysts and interviews with key market participants. The aim of this project is to get a sense of who the major actors are in the collateral flow space and to learn more about the way collateral is being used and where the risks are pooling.¹⁶⁶ This chapter provides a summary of this “work in progress” so far.

Understanding the risks

The increased use of collateral in financial transactions has implications for the structure of the financial system. It increases interconnectedness and leads to asset encumbrance on banks’ balance sheets.¹⁶⁷ A consequence of this is added complexity and opacity in the financial system, which in turn increases the risk of pro-cyclicality due to haircuts and margin requirements. Furthermore, the need for collateral has prompted market participants to rely on existing practices or develop innovative ways to move collateral around to where it is most needed.

These practices include collateral transformation and optimisation services as well as repo and re-hypothecation. In collateral transformation a customer, for a fee, posts lower grade collateral to a dealer in exchange for higher quality collateral.¹⁶⁸ Essentially, the client pays a fee for this transfer of risk. The customer must also accept risk management elements that include haircuts and frequent valuation of the transaction. Repo, which is generally very short-term, involves one party (the borrower) pledging their securities to a “lender” in exchange for cash. The borrower agrees to buy-back the securities at a later date and at a higher price.

Re-hypothecation or re-use of collateral generally involves a borrower pledging collateral to secure a debt and the creditor re-using the pledged collateral as collateral for further borrowing. In the repo market, the initial borrower keeps ownership of the collateral and can grant a creditor a right to re-hypothecation. Last year’s Risk Outlook chapter on collateral outlines the risks inherent in each of these practices in detail.¹⁶⁹

Central banks and CCPs

Even before the 2008 crisis, one of the major sources of liquidity for credit institutions was the open market activities of the central banks. In the wake of Lehman’s collapse, central banks globally provided unprecedented levels of liquidity to support the market. These programs in some jurisdictions accepted most forms of collateral for liquidity purposes.¹⁷⁰ As a result, central bank balance sheets have grown as large amounts of collateral have been posted to them.¹⁷¹ As highlighted by Figure 103, this was especially true in Europe. Switzerland appears to be an outlier compared to Japan, Eurozone and the US.

Certain regulators are requiring an increasing number of OTC derivatives trades to be moved to a central clearing model (see *Part II, Chapter 3*). In derivatives trading, collateral is posted against trades to act as insurance and protect against a default of the counterparty. This collateral is often in the form of cash or high quality and highly liquid securities.¹⁷² As a result, CCPs will become increasingly important repositories of collateral in the post crisis regulatory landscape. Based on data from the largest 20 CCPs globally (see Figure 104), CCPs currently hold \$200 billion of assets posted as initial margin. The largest amount of collateral is held by U.S. based CCPs. However, the data is not complete as LCH.Clearnet and Eurex, two of the largest clearinghouses in the

166 FSB WS5 has agreed to develop standards and processes for securities financing data collection and aggregation at the global level. The data expert subgroup of WS5 plans to propose policy recommendations by November 2014 which will then be published for public comment.

167 See e.g. Aerdt Houben and Jan Slingeborg, “Collateral scarcity and asset encumbrance: implications for the European financial system”, *Bank of France, Financial Stability Review* no. 17, April 2013

168 The FSB defines collateral transformation as a short term transaction whereby lower quality assets (e.g. less liquid and/or lower credit quality) are exchanged for better quality collateral (or cash). This collateral is then eligible for posting as margins in OTC derivatives transactions.

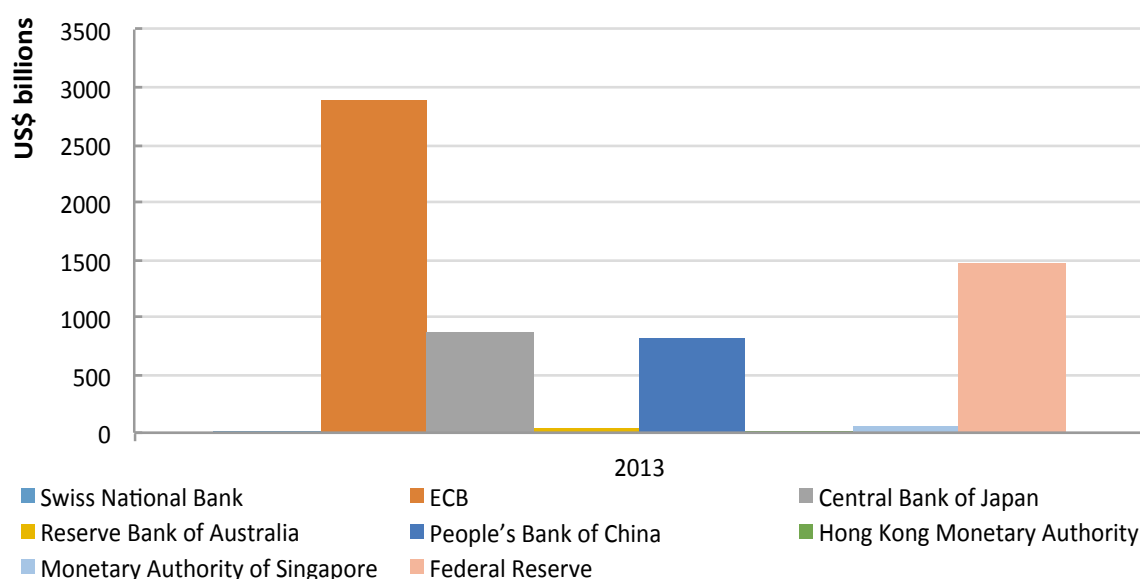
169 See IOSCO, *Securities Markets Risk Outlook 2013-14*, 2013

170 Bank for International Settlements Committee on the Global Financial System, “Asset encumbrance, financial reform and demand for collateral assets”, *CGFS papers No.49*, May 2013.

171 Central banks’ balance sheet grew out of their liquidity provision (i.e. asset side), which required taking on significant amounts of collateral (liabilities).

172 Many CCPs only accept cash as variation margin, but do accept highly liquid securities as initial margin.

FIGURE 103: COLLATERAL POSTED TO SELECTED CENTRAL BANKS



Source: Central bank balance sheets

UK and continental Europe, respectively, did not report their figures.¹⁷³

In a similar process to central banks, once collateral ends up within a CCP structure, the flow of collateral stops there; that is, legislative requirements mean that collateral, once posted, cannot be re-hypothecated by a CCP.¹⁷⁴

A CCP, by acting as a central counterparty, reduces net exposures for individual clearing members as well as the market in the aggregate. As exposures are reduced, collateral requirements are similarly reduced. Thus, as more transactions are cleared, it is reasonable to expect that collateral needs in the aggregate will decrease. Nonetheless, clearing may increase collateral requirements by requiring that collateral be posted by both parties for all cleared transactions. In contrast, in the un-cleared space, many bilateral arrangements do not require collateral, require collateral from only one party,

or require collateral only when risks exceed a certain predetermined threshold. These bilateral arrangements are more subject to pro-cyclical calls for collateral.

Another effect of clearing is that all participants are required to make daily mark-to-market (i.e., variation margin) payments.¹⁷⁵ The discipline of making daily mark-to-market payments in cash requires participants to deliberately and diligently manage cash on an intra-day and day-to-day basis.

Banks and broker-dealers

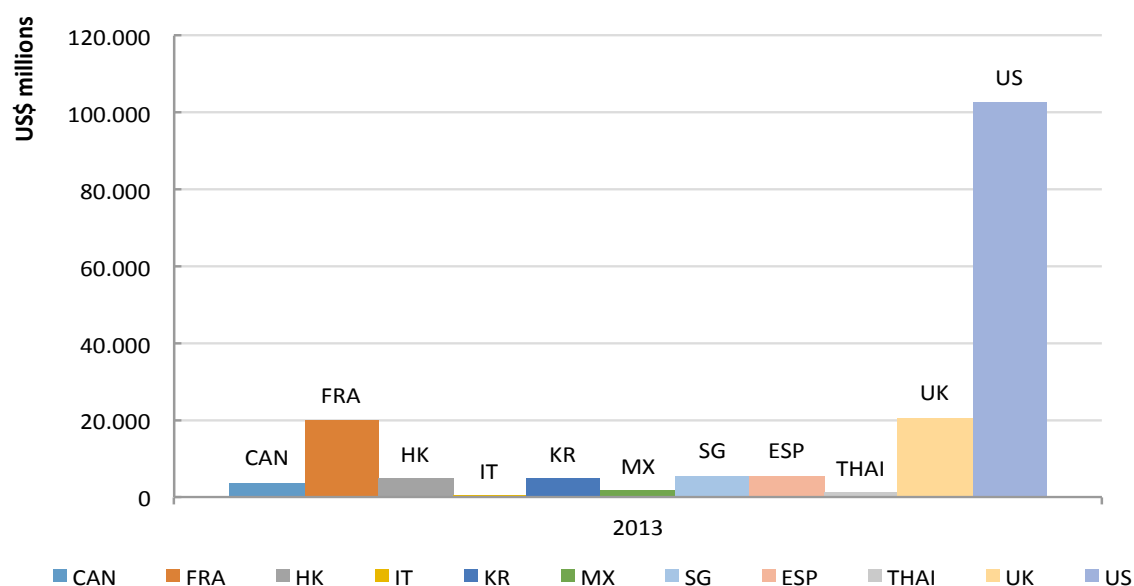
Dealers receive collateral from other entities for collateral swaps or upgrades. Typically, in such a transaction, the collateral posted to the dealers has a lower grade of liquidity and/or credit than the collateral received back from the dealer. Clients of dealers pay a fee for this service and get collateral that they can use in a transaction with a CCP, a Central Bank or other counterparty. Discussions with dealers suggest that such requests are generally low relative to the collateral flows from the clients, such a hedge funds, pension funds and insurers.

¹⁷³ In their 2013 annual report (page 11), Eurex says that they received EUR 34.8bn in margin calls (IM+VM) and EUR 48.4bn as collateral. Latest record of outstanding volume of collateral managed on June 2013 was EUR 223.5bn. LHC Clearnet reported in the 2013 annual report that it held average cash collateral for EUR 39.3bn.

¹⁷⁴ Limited amounts of cash collateral for initial margin can be invested in highly liquid, low risk products.

¹⁷⁵ Such payments are typically required to be made by the morning of the next business day.

FIGURE 104: COLLATERAL HELD BY CCPs BY REGION



Source: Thomas Murray CCP Risk Assessments of selected CCPs

Note: The estimate of collateral held at CCPs is based on the largest 21 CCPs who have self-reported during the CCP risk assessment exercise. Not all CCPs are captured by this exercise. As such, the collateral estimate, by and region and in total, should be considered a lower bound estimate.

The total collateral received by the 10-15 largest global banks was \$5.8 trillion as of end-2013 (see Figure 105). This is sharply lower than the \$10 trillion peak as of end-2007, but bouncing back slightly from the trough of \$5.0 trillion as of end-2009.¹⁷⁶ At the individual level four banks have showed a sharp decrease of collateral received before and after the upsurge of the financial crisis: UBS moved from \$1.3 trillion of collateral received in 2007 to 400 billion in 2013. The same path was followed by Morgan Stanley (from \$950 to \$500 billion in the same period), Merrill/Bank of America more than halved the amount of collateral received from \$1.2 trillion to less than \$600 billion and Goldman Sachs experienced a less severe decrease from \$900 to \$600 billion.

Hedge funds

Hedge funds largely finance their positions in two ways: (i) loans made under prime-broker agreements with their prime brokers and (ii) repurchase

agreement (repos), generally with other banks that are not their prime brokers. As such they are interconnected with the wider financial economy.

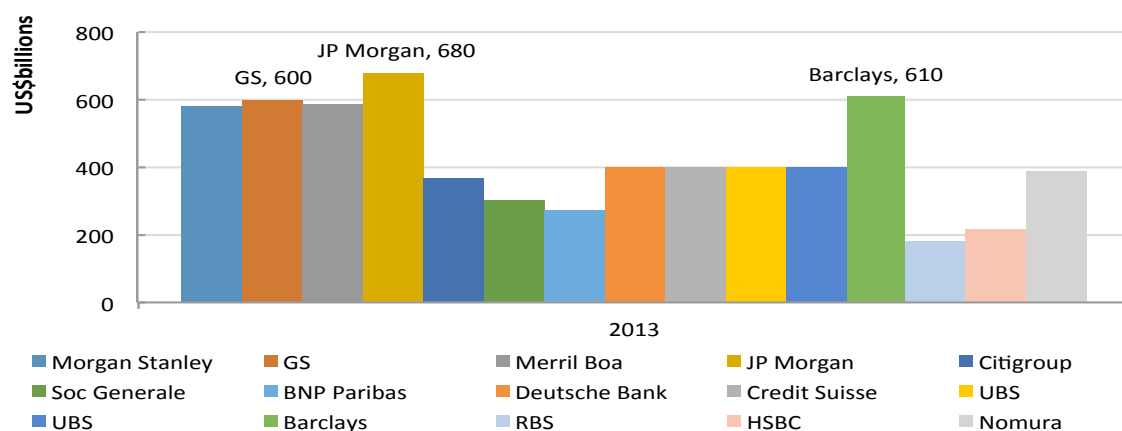
Hedge funds usually pledge their securities as collateral for reuse to their prime brokers in exchange for cash borrowing from the prime brokers. Through this process hedge funds can take on (sometimes) significant amounts of financial leverage. This interconnectedness can be increased through the use of financial derivatives, which in turn increases synthetic leverage. In return for lower prime brokerage fees, hedge funds also allow prime brokers to re-hypothecate the assets they have pledged. This generates the opportunity for more complicated refinancing chains, which can be vulnerable to market stress.¹⁷⁷

The total collateral from hedge funds posted to the large prime brokers and dealers is estimated to have been about \$1.6 trillion as of end-2007. Of this

176 See M. Singh, "Financial Plumbing and Monetary Policy", *IMF Working Paper*, 2014.

177 See F. Hespeler and C. Witt: "The Systemic Dimension of Hedge Fund Illiquidity and Prime Brokerage", *ESMA Working Paper*, WP-2014-2, 2014.

FIGURE 105: PLEDGED COLLATERAL RECEIVED BY DEALER BANKS



Source: M.Singh IMF

sum about \$850 billion has come via prime broker funding and \$750 billion from repo funding outside the prime brokers. Similarly, estimates for 2013 suggest that \$1.85 trillion of collateral from hedge funds came to the large dealers. Of this sum \$900 billion collateral from hedge funds was pledged for reuse to the banks via repos.¹⁷⁸

Custodian banks

The requirement to clear OTC derivatives, coupled with the liquidity requirements under Basel III, will require banks to hold more higher-quality assets on their books to withstand financial shocks. The new requirements will require additional assets. Custodians are administering enormous amounts of assets and are increasingly taking up the role of providers of collateral. An analysis of the annual reports of the five biggest custodian banks shows that at year end of 2013 they collectively held \$3.8 trillion of assets as collateral (see Figure 106). Bank of New York Mellon was the biggest holding \$2 trillion of assets, followed by Euroclear with \$787 billion and JP Morgan Chase with \$726 billion.

Assessing the risks

Understanding where and how risk transfer takes place is crucial to assessing how risks may be pooling in the financial system. Gaining this understanding

has been hampered by the lack of data and disclosure of collateral positions of firms. Therefore, the following analysis should not be taken as definitive but as a basis for further research.

The lack of evidence of a shortage of collateral at the moment does not mean that this will always be the case. Additional regulations will put in place additional collateral requirements. Furthermore, and more importantly for potential systemic risk analysis, the markets have benefited from a relatively calm environment with low volatility in prices. A shock in prices could disturb this balance, with sudden high margin calls.¹⁷⁹ Limited data prevents the performance of scenario analysis on this point, but both market participants and regulators will need to be aware of potential shocks and closely monitor the positions of the major players in all segments of the markets.

Related to the above point are the risks involved in the market solutions for moving collateral around the system. These solutions include collateral transformation and re-hypothecation of assets. These activities are performed mainly by dealer banks and custodians. Other market participants receive high quality liquid assets from these actors, by exchanging lower quality assets for a fee in order to comply with capital requirements related to Basel III regulations

178 See M. Singh, "Financial Plumbing and Monetary Policy", *IMF Working Paper*, 2014.

179 Margin calls can come about due to: contractual references or changing policy.

FIGURE 106: BOOK VALUE OF COLLATERAL HELD BY CUSTODIAN BANKS



Source: Annual reports of selected custodian banks; As of December 2013.

or CCP rules. This risk transfer interconnects the financial system. CCPs could pose additional risks by the reuse of collateral,¹⁸⁰ in particular collateral in the form of cash. In many occasions this cash is again posted to dealer banks, which amplifies the interconnections in the financial system.¹⁸¹

These types of risk transfer are not made public in the periodic reports issued by the firms, thus further analysis is difficult at this point. However, it is clear that these activities lead to greater opacity in the financial system and could increase operational risks, as well as funding and rollover risks. Anecdotal evidence suggests that the described practices are concentrated in the US and Europe. The practice seems less widespread in the Asia-Pacific region and the rest of the world. Firms and regulators may closely monitor these positions and assess the stability of the financial system in case of shocks.

Going forward

The disclosure of positions and transactions involving collateralisation of assets is still poor.

This in itself is a risk for the stability of the financial system. Regulators will need to monitor the management of collateral by firms and the financial innovation each market segment. And firms will need to provide better disclosure of aggregated positions and provide scenario analysis on how positions will hold in times of shocks in the financial system.

As noted above, at the global level, the FSB, with the active participation of IOSCO members, is making progress on developing standards for data gathering and disclosure through the WS5 data expert's subgroup as well as in its Enhanced Disclosure Task Force. But this progress is proving to be slow. In the meantime, risks could be building up, indicating an urgent need for global data and a deeper understanding of the use of collateral. In addition, securities markets regulators would need to closely monitor activities in their markets and analyse the information jointly with prudential regulators.

¹⁸⁰ The variation margin received by CCPs is owned by them (it is no pledge from the clearing member). This is not so much re-use of collateral in the sense that you use counterparties' assets, but interconnects the system. The CCP is allowed to have investments with cash collateral, but with restrictions. Furthermore, also central banks and state treasuries that have overnight cash invest them in the short term market.

¹⁸¹ The reinvestment of cash collateral is a major business for custodians acting as agent lenders. Under EMIR, CCPs can only reinvest cash in highly liquid collateral

Chapter 5: Governance and Culture of Financial Firms

Introduction

A string of financial crises, including the Asian crisis of 1998, the dot-com bubble and the Enron scandal of the early 2000s and the global financial crisis of 2007/2008¹⁸² have brought the issue of corporate governance to the fore.¹⁸³ The De Larosiere Report in the EU,¹⁸⁴ published in 2009, concluded that corporate governance “*is one of the most important failures of the [2007/2008] crisis*”. Furthermore, the Group of 30 (G30) report on corporate governance noted that underpinning the direct causes of the most recent financial crisis, is “[a] critical subtext... a pervasive failure of governance at all levels.”¹⁸⁵ Consequently, a number of organizations and jurisdictions have put forward corporate governance critiques and frameworks over the last few decades (see Box 5).

More recently, governance failures have been signalled as a key risk in a growing number of scandals that have shocked financial markets, such as the Libor-scandal.¹⁸⁶ Consequently, between 2007 and 2013, investor confidence suffered a steady decline (see Part II, Chapter 1, Figure 65). Furthermore, trust in the financial markets also has been affected. Figure 107 shows an index of financial trust for the US population, created by the business schools of the University of Chicago (Booth) and Northwestern University (Kellogg). It highlights that while investor trust in mutual funds has increased slightly over the past six years, trust in banks has been volatile since end-2008. Very few people trust the functioning of stock markets and large corporations.

At a micro, individual-firm level, there is some evidence to suggest that good corporate governance contributes to strong corporate performance, lower cost of capital, lower borrowing costs and outperformance relative to one's corporate peers.¹⁸⁷ In the Economist Intelligence Unit's survey on “Risk of risks”, 58% of business leaders responded that unethical practices were the biggest source of reputational risk to a corporation. In contrast, the survey indicated that companies that exhibit strong governance principles have “...a strong competitive advantage”.¹⁸⁸

At the aggregate level, sound corporate governance of financial firms is seen as a critical element in preventing a build-up of potential systemic risks.¹⁸⁹ Good governance can better ensure that firms deliver suitable and efficient financial products and services in a transparent way. Consequently, good governance can help prevent those practices that can undermine the performance of firms, lead to their bankruptcy, and erode overall public confidence in financial markets.^{190 191} In fact, firms with poor governance appear to have performed badly during the recent crisis.¹⁹²

What follows in this chapter is a discussion of some of the main issues currently being debated in the corporate governance field and how risks from this area may materialise, impacting the financial system.

182 See e.g. OECD Strategic Response to the Financial Crisis <http://www.oecd.org/daf/ca/corporategovernanceandthefinancialcrisis.htm>

183 Stijn Claessens and Burcin Yurtoglu, *Corporate Governance in Emerging Markets: A Survey*, January 2012

184 De Larosiere, *The High-Level Group on Financial Supervision in the EU*, 25 February 2009

185 G30, *Toward Effective Governance of Financial Institutions*, April 2012

186 See e.g. the increasing number of times corporate governance was mentioned by experts as a potential systemic risk in: Shane Worner, “A Survey of Securities Markets Risk Trends 2014. Methodology and Detailed Results”, IOSCO Research Department Staff Working Paper, June 2014.

187 Guiso *et al* (2013) (see Footnote 224 for full reference) show that the internal perception of the company's code of ethics positively affects the firm's profitability. Goss and Roberts (2011) show that firms with governance concerns (proxy by social responsibility) pay a premium of between 7-18 basis points when borrowing funds (See Footnote 227 for full reference). Bhorjarj and Sengupta (2003), show that corporations with a strong outside controlling influences on the board enjoy a lower bond yields and higher credit ratings (see Footnote 226 for full reference).

188 The Economist Intelligence Unit, *Reputation: Risk of Risks*, 2005

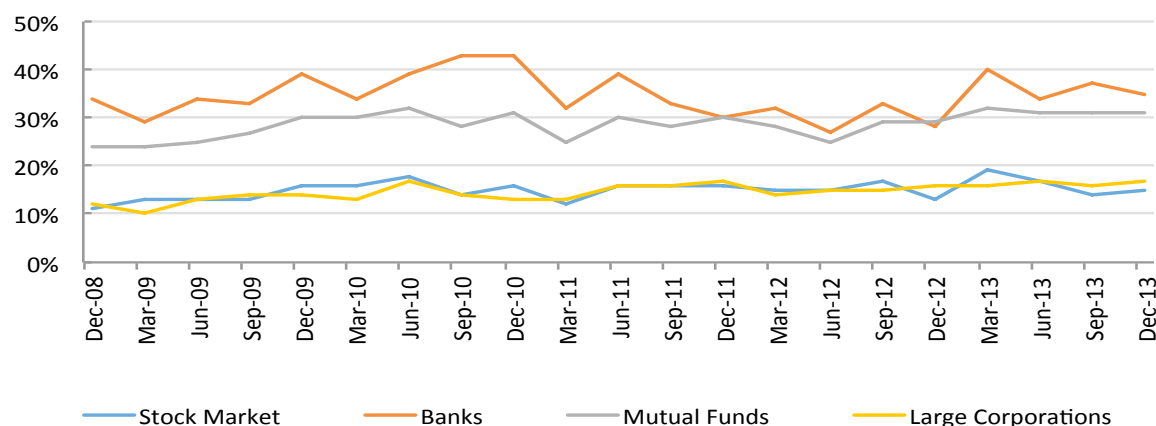
189 Group of Thirty, *A New Paradigm. Financial Institution Boards and Supervisors*, December 2013 and Group of Thirty, *Toward Effective Governance of Financial Institutions*, 2012.

190 See e.g. Netherlands Authority for the Financial Markets (AFM), *Voortdurende Zorgplicht*, 2005.

191 E.g. Enron and Parmalat which suffered bankruptcies in the early 2000's leading to enhanced corporate governance standards globally.

192 D.W. Diamond and R.G. Rajan, “The credit crisis: Conjectures about causes and remedies”, *American Economic Review*, vol 99, 2009; G Kirkpatrick, “The corporate governance lesson from the financial crisis”, *OECD Financial Market Trends Report*, 2009

FIGURE 107: FINANCIAL TRUST INDEX



Source: University of Chicago (Booth) and Northwestern University (Kellogg)

Box 5: Corporate Governance Frameworks

The Cadbury Report was released in the UK in 1992,¹⁵ providing recommendations on boards and accounting. The OECD released a set of principles in 1998, and later updated in 2004, focusing on (1) Rights of Shareholders; (2) Equitable Treatment of Shareholders; (3) Role of Stakeholders in Corporate Governance; (4) Disclosure and Transparency; (5) Responsibilities of the Board (strategic guidance, annual budget formulation, major capital expenditure, selection, compensation and monitoring of key executives). In the United States, the Sarbanes-Oxley Act, passed in 2002, and the Dodd-Frank Wall Street Reform and Consumer Protection Act, passed in 2012, set legal standards and requirements for corporate governance. The Bank of International Settlements (BIS) released Principles for Sound Liquidity Risk Management in 2008, which highlights specifically principles around risk management practices.

In Europe, the European Commission (EC) published a green paper in 2010¹⁶ focusing on the Board of Directors; Risk Management; Role of Supervisory Authorities, Auditors, Shareholders; Remuneration; and Conflicts of Interest. In June 2011, the EC published a draft directive on disclosure of non-financial firms and diversity information, which was adopted by the European Parliament on 15 April 2014. The directive stipulates that firms “will need to disclose information on policies, risks and results as regards environmental matters, social and employee-related aspects, respect for human rights, anti-corruption and bribery issues, and diversity of boards of directors.”¹⁷ The UK Corporate Governance Code,¹⁸ introduced in 2010 and updated in 2012, highlights the importance of ‘values’ set at the top and focuses on (1) Leadership; (2) Effectiveness of Boards, Directors and Committees; (3) Accountability; (4) Remuneration; and (5) Relations with Stakeholders.

The World Bank and International Monetary Fund use the OECD Principles as a basis for their country-level “Corporate Governance program on Reports on the Observance of Standards and Codes” (ROSC).¹⁹ This program also covers emerging markets, in which firms tend to have different ownership structures and hierarchies compared to firms in advanced economies. A report by Claessens and Yurtoglu suggest that corporate governance in emerging markets differs from advanced economies due to “still-limited development of private financial markets and poor access to financing, concentrated ownership structures, and low institutional ownership.”²⁰ For example, in many emerging markets, firms tend to be family-run (insider controlled), with a high concentration of block ownership. The report notes that in East Asian countries, largest shareholdings are around 50%. In Latin America, largest shareholdings tend to be more than 50%. This compared to an average of 21% in the United States.²¹ According to Claessens and Yurtoglu, this different ownership structure in emerging market firms can have an impact on agency problems. For example, where ownership is concentrated, information issues are less prominent, and monitoring is more easily and willingly undertaken by management. Manager-shareholder conflicts are less likely.

Background

The OECD defines corporate governance as “*the system by which business corporations are directed and controlled. The corporate governance structure specifies the distribution of rights and responsibilities among different participants in the corporation, such as, the board, managers, shareholders and other stakeholders and spells out the rules and procedures for making decisions in corporate affairs. By doing this, it also provides the structure through which the company objectives are set and the means of attaining those objectives and monitoring performance*”.¹⁹³ Figure 108 provides a schematic overview of the main actors and relationships related to corporate governance.

Corporate governance is a broad concept and, as Figure 108 presents, is reliant on an interconnected network of actors, all with differing incentives and motives within and outside of the corporate entity. Sound corporate governance in a financial firm can occur when actors and relationships are well-structured and well-controlled by internal and external gatekeepers and quality control systems so that the firm provides:

- > financial products and services that are needed/demanded by society; and
- > sufficient financial returns to the share and bond holders.

Two other actors, the external auditor and the supervisor, are outside the corporate governance space of the firm but have influence on the behaviour of the firm. The independent external auditor assesses whether the financial statements, and their compilation, prepared by management are in accordance with specific accounting rules and laws. Supervisors oversee that the financial firm complies with the relevant financial regulations. Financial regulations vary around the globe and span from a main focus on disclosure, e.g., in the US, to regulations that oblige firms to sell only financial products that are in the interest of the client, e.g. in various jurisdictions in Europe.¹⁹⁴

¹⁹³ OECD Corporate Governance Principles 1999 and 2004.

¹⁹⁴ In the US, the securities regulatory regime is disclosure-based, not merit-based. Accordingly, in the US the securities regulator, the SEC, is not a part of the governance structure of a listed company, nor does it take any responsibility for how the governance structure is set out. In addition, oversight functions of corporate issuers and su-

There is an ongoing discussion among policy makers and academics on the way corporate governance has played a role in past crises and how weak corporate governance can facilitate the future build-up of potential systemic risks; while sound corporate governance can benefit all actors. As such, corporate governance is a complex topic to tackle from a systemic risk perspective. In the literature, three main developments have been noted:

- (1) Approaches to corporate governance currently centre on financial disclosure, audit and risk management.

One widely accepted view is that the crisis of the early 2000s, marked by the failure of Enron, Worldcom and Parmalat, focused the attention of the corporate governance debate on the role of financial disclosure and external audit, and risk management.¹⁹⁵ The Sarbanes-Oxley Act in the US requires CEOs and CFOs to sign off on financial statements. The Corporate Governance Code in the UK, which predates Sarbanes-Oxley, also emanated from corporate failures due to weak governance. Around the globe these examples were followed by the implementation of similar corporate governance codes for listed companies in concerned jurisdictions.

- (1) There is a shift of focus from the corporate governance of listed firms in general and towards financial firms specifically

The 2007-2008 crisis originated in the financial sector, prompting the focus on corporate governance to shift somewhat from listed firms to financial firms. A key question is how embedded risk management structures in financial firms could allow for the build-up of so much risk – and how this risk could have escaped the attention or focus of the CEOs and the boards.¹⁹⁶ Questions have also been raised around the role of compliance and internal audit.¹⁹⁷ Both financial firms and regulators have looked more closely at these issues as they

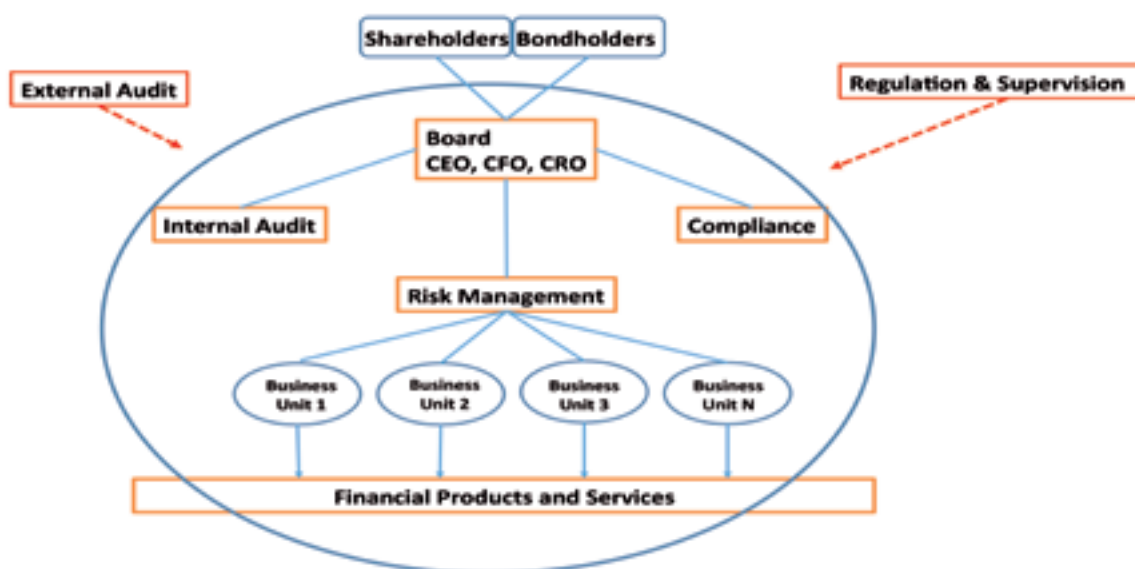
pervised financial firms usually differ, with corporate issuers having either no or much fewer regulatory responsibilities than supervised financial firms.

¹⁹⁵ See e.g. Grant Kirkpatrick, *The Corporate Governance Lessons from the Financial Crisis*, OECD 2008.

¹⁹⁶ See e.g. FSA, *The Turner Review: A regulatory response to the global banking crisis*, March 2009

¹⁹⁷ idem

FIGURE 108: GOVERNANCE AND THE FINANCIAL FIRM – MAIN ACTORS AND RELATIONSHIPS.



Source: IOSCO Research Department

gain greater prominence in the discussion on the prevention of future risk build-up.¹⁹⁸ The former question specifically has directed more corporate and regulatory attention to risk governance and risk culture in financial firms.

- (3) Academic studies have found a strong positive link between corporate governance and lower cost of debt and equity capital, and strong performance

Guiso *et al* show that a firm's integrity directly affects profitability.¹⁹⁹ If this relationship holds in aggregate, then the benefits of ethics/corporate governance should align all incentives of the actors within the running of a corporation. In other words, if sound governance leads to proper ethics, which in turn leads to greater profits for the company, there should be increased returns for shareholders and management. Cremers *et al* (2007) present evidence that strong shareholder governance reduces conflict between the interests of shareholders and bondholders,

creating higher yields and higher returns.²⁰⁰ Bhorjarj and Sengupta link corporate governance practices of a firm to higher bond ratings and therefore lower yields (i.e. lower borrowing costs).²⁰¹ Klock *et al.* confirm that corporate governance is a growing concern of bondholders.²⁰³ Furthermore, Chava *et al.* suggest that firms that rely too much on centralised rather than embedded corporate control are punished by costlier bank loans.²⁰⁴

Understanding the risks

Underpinning these discussions on corporate governance is a wider discussion on incentives. A stylised version of the corporate entity is

¹⁹⁸ See FSB, *Thematic Review on Risk Governance Peer Review Report*, February 2013; FSB, *Principles for an Effective Risk Appetite Framework*, November 2013; and FSB, *Framework for Assessing Risk Culture*, April 2014; SFC, *G-SIFs: Trends in Risk and Risk Mitigation*, December 2013

¹⁹⁹ Luigi Guiso, Paola Sapienza and Luigi Zingales, "The value of Corporate Culture", *NBER Working Paper Series No.19557*, 2013

²⁰⁰ Martijn Kremers, Vinay Nair and Chenyang Wei, "Governance Mechanisms and Bond Prices", *The Review of Financial Studies*, vol 20, 2007

²⁰¹ Sanjeev Bhorjarj and Partha Sengupta, "Effects of Effect of Corporate Governance on Bond Ratings and Yields: The Role of institutional Investors and Outside Directors", *The Journal of Business*, vol 76, 2011

²⁰² See in Allen Goss and Gordon Roberts, "The impact of Social Responsibility on the Cost of Bank Loans", *Journal of Banking and Finance*, vol 3, 2011

²⁰³ Mark Klock, Sattart Mansi and William Maxwell, "Does Corporate Governance matter to Bondholders?", *Journal of Finance and Quantitative Analysis* (forthcoming)

²⁰⁴ Sudheer Chava, Dmitry Livdan and Amiyatosh Purnanandam, "Do Shareholders Rights affect the cost of Bank Loans?", *The Review of Financial Studies*, 22 (8)

that the firm is owned by a group of investors (shareholders) and financed by another group of stakeholders (bondholders and other creditors). In some situations, the entity is run (or managed) by a board of directors who do not have a financial stake in the company. The shareholders, while having a clear interest in the firm performing well, are distanced from monitoring the effort or abilities of the managing board. This arrangement raises a principal-agency problem where incentives are misaligned. Shareholders want the business to do well, thereby maximising their financial return on investment. Meanwhile, managers, who seek a salary, will shirk on their labour efforts to maximise the return on their wage.

To better align the incentives of firm owners and firm managers, options like performance pay are introduced into the salary package of managers. Consequently, when the firm does well, everyone gains. However, short-termism in managerial tenure means that actions can be taken to maximise the financial returns over the short term while they may not be the best for the viability of the corporate entity.

When the incentives for individuals in a financial firm are misaligned with the objectives of shareholders, or with financial stability more generally, the build-up of systemic risk may occur. Before the recent crisis, managers in many financial firms were personally rewarded in the short-term for taking on risks and excessive leveraging, as were shareholders through increasing returns.²⁰⁵ When the crisis erupted, these same actors did not suffer proportionate repercussions, with the exception of a few high profile cases. Such perverse incentives can lead to short-termism in the behaviour of firms and the build-up of systemic risk.

There are many ways to mitigate this problem. Legal recourse, takeover activity (although the impact of takeover activity can be mitigated through covenant requirements in company articles) and the selling of shares are just a few examples. Shareholder activism also can place external pressure on company boards to act in the interests of the shareholder, thereby reducing

the monitoring costs. Additionally, performance-based pay aligns these contradicting incentives and insures the manager against any idiosyncratic risk of the firm.²⁰⁶ But this is not the whole story. Quality internal corporate governance mechanisms, it has been suggested, can mitigate the costs of the principle-agency problem (for example, the cost of monitoring and information asymmetry costs of managerial quality). Consequently, the incentives of the board can be properly aligned with those of the share/bondholders through a combination of performance pay contracts and corporate governance, where governance acts as a substitute for performance pay.²⁰⁷ These approaches and remedies tend to stem from three processes and actors in the corporate governance structure: board and management; shareholders; and internal risk controls.

Board and management

In order to understand how risks related to corporate governance may build-up in the financial system, one must begin by looking at the role and quality of the top management of a financial firm.²⁰⁸ The top layer of a financial firm is usually made up of a board with the chief executive officer (CEO), the chief financial officer (CFO) and, increasingly since the crisis, the chief risk officer (CRO). Boards may also include members with an internal oversight role. The board is authorised by the owners/shareholders to take decisions on their behalf and is, in this capacity, responsible for the firm's vision and strategy. The board is also responsible for the quality of the products and services of the firm, the performance of the firm, as well as the flow of information used internally to control the firm and externally to comply with public rules and regulations such as accounting and reporting rules. In addition, the board leads strongly the internal culture and incentives structures and as such they define the pay structure within the firm. In turn, the

²⁰⁵ James Crotty, "Structural causes of the global financial crisis: a critical assessment of the 'new financial architecture'", *Cambridge Journal of Economics*, vol 33, 2009

²⁰⁶ Viral Acharya, Marc Gabarro & Paolo Volpin "Competition for managers, Corporate Governance and Incentive compensation", *NYU Stern Working paper*, 2012

²⁰⁷ See e.g. Netherlands Authority for the Financial Markets (AFM), *Voortdurende Zorgplicht*, 2005 and R. Fahlenbrach, "Shareholders Rights, Boards and CEO Compensation", *Review of Finance*, vol 13, 2009

²⁰⁸ The description in the paragraph is for the sake of simplicity very generalised. Variations to the generalised model might exist, and the model might not apply to all jurisdictions.

shareholders of a firm define the pay of the board executives.²⁰⁹

The Executive Committee typically sits just below the board in the firm hierarchy. The Executive Committee which could include the CEO, the chief operations officer (COO), the CFO, the CRO, the chief compliance officer (CCO), the general counsel and other senior members of management, including both revenue producing and oversight functions.

Shareholders

Shareholders are the legal owners of a corporate entity and appoint a management board to oversee the day-to-day operations of the firm. As the ultimate owners of the entity, shareholders expect a return on the capital they have invested, depending on the success of the venture. This is usually in the form of a dividend payment or some other type of yield. Additionally, as owners of the company they have the right to vote on certain issues such as membership to the board. Other benefits include the ability to take legal action in the event of poor management and the right to any assets leftover after windup.

Internal risk and quality controls

Risk and quality controls refer to internal codes of practice for risk identification/mitigation and a series of “checks and balances” that may exist for internal processes and systems. The internal risk and quality controls are an important part of risk governance and can concentrate on financial, reputational, regulatory, compliance, conduct and operational risks. Risk governance can take the form of [risk identification and mitigation] frameworks, systems and controls that permeate all levels of the organisation. Internal structures can include risk committees, a chief risk officer (CRO) and automated processes and IT systems that involve limited human intervention. The strength of risk governance in an organisation can be observed through examining the strength of risk processes and controls in place.

²⁰⁹ Generally speaking in the US the development work of vision, strategy, pay, and so forth would be done by management, with perhaps approval by the board.

Assessing the risks

Given the breadth of issues in the corporate governance sphere, this section will focus on a few main areas currently under debate, related to the actors and processes identified in the previous section. These issues are shareholder activism, board and managerial quality and functioning of internal controls.

Board and managerial quality

Leadership, by the board and at the managerial level, is an important element of corporate governance, influencing the values, culture, incentives and success of a firm. A dysfunctional or underperforming CEO can destroy the market valuation of a firm within a short period.²¹⁰ Such CEOs can have a tangible negative influence on the values and ethics of a corporation, the morale of employees, and the risks taken by a firm as a whole.²¹¹ A dysfunctional board can compromise the oversight function in a firm and skew incentives. The value and culture of a firm, while a soft aspect of governance, is also important. The G30 report on corporate governance notes, “*values and culture drive people to do the right thing even when no one is looking*”.²¹²

Nevertheless, the impact of the composition of the board on board performance, and thus on firm performance, is still under debate. In 2003, a study by Hermalin and Weisbach did not find any correlation.²¹³ However, one recent study, taking into account data from the crisis, shows that firms with ‘powerful’ independent boards indeed correlate with higher shareholder value, higher accountability for negative performance and lower instances of destructive M&A bids.²¹⁴ Another study has found correlation between ‘board processes’ – such as

²¹⁰ Jay Conger and David Nadler, “When CEOs Step Up To Fail”, *MIT Sloan Management Review*, April 2004

²¹¹ Clive Boddy, Richard Ladyshevsky, Peter Galvin, “The Influence of Corporate Psychopaths on Corporate Social Responsibility and Organizational Commitment to Employees”, *Journal of Business Ethics*, April 2010

²¹² G30, *Toward Effective Governance of Financial Institutions*, April 2012

²¹³ Hermalin, B. E., and M. Weisbach, “Boards of Directors as an Endogenously Determined Institution: A Survey of the Economic Literature”, *Economic Policy Review*, vol 9, 2003.

²¹⁴ Kathy Fogel, Liping Ma, Randall Morck, “Powerful Independent Directors”, *National Bureau of Economic Research (NBER) paper*, January, 2014

performance evaluation, director selection and the means for removing a director – with board performance.²¹⁵

One issue of debate is to what extent boards, including independent boards, require relevant and financial expertise. An assessment of behaviour and actors in the lead up to the financial crisis has revealed that the boards of the most-affected banks included people who had limited experience and limited knowledge of the [risk profiles or] financial positions of the firm and the complex products involved.²¹⁶ Financial expertise is an important factor in running a financial firm, yet one study suggests that while in periods of stability, financial expertise positively relates to bank performance, this relationship reversed once the crisis started.²¹⁷

Thus, financial expertise on its own may not be enough. Some commentators point out that a Board's ability to make good decisions is related to the quality of the information they receive.²¹⁸ As a result, technological innovation that can quickly and efficiently compile relevant information and help present it in a coherent and concise manner to the board has been suggested as a needed development.²¹⁹

On these points, the recent FSB *Thematic Review on Risk Governance Peer Review Report*,²²⁰ noted that FSB

member jurisdictions should consider: "Setting requirements on the independence and composition of boards, including requirements on relevant types of skills that the board, collectively, should have (e.g. risk management, financial industry expertise), as well as the time commitment expected." At the firm level it was suggested that "*Boards should satisfy themselves that the information they receive from management and the control functions is comprehensive, accurate, complete and timely to enable effective decision-making on the firm's strategy, risk profile and emerging risks.*"

The quality of the board is linked to the quality of the managerial layer of a firm. The performance of the management layer of a firm is theoretically assessed by the owners of the company (the shareholders), through the board, who in turn set compensation to match performance.²²¹ Where a board sets managerial compensation to match performance (including management of risks), the incentives of shareholders and managers should be aligned.

However, the impact of remuneration on corporate governance may not be so clear cut. In one study, higher CEO remuneration in some banks was linked with lacklustre performance during the crisis, possibly due to risky (but profitable) decisions made previously.²²² This may be in part due to short-termism.²²³ Another contributing factor could be the level of media attention. In a recent study looking at 636 acquisition attempts over a decade, starting in 1990, it was revealed that a manager's "...sensitivity to firm stock price reaction at announcement is dependent on the tone of media attention."^{224 225}

Debate continues on the impact of remuneration practices on managerial performance and risk-taking.

215 David Wan and C.H. Ong, *Board Structure, Process and Performance: evidence from public-listed companies in Singapore*, 2013

216 In an article published by the Financial Times, Paul Myners (the former City fund manager and the UK Government's Financial Services Secretary) described "the typical bank board" in the following terms: "It resembles a retirement home for the great and the good: there are retired titans of industry, ousted politicians and the occasional member of the voluntary sector [...] The business of banking is exponentially more complicated than a generation ago, and the panel guiding it must be able to follow its dealings [...] Few non-executives have the skill or appetite to challenge the thinking behind risk budgeting; to identify weaknesses in risk measurement techniques or the spurious accuracy implied; to reach their own view on asset and liability valuations or reach a view on capitalisation independent from the minimum levels required by regulators and suppliers of credit".

217 B. Minton, J.P.A. Taillard and R. Williamson, "Do independence and financial expertise of the board matter for risk taking and performance?", *Working Paper, Ohio State University*, 2010

218 Robert Thomas, Michael Schrage, Joshua Bellin and George Marcotte, *How Boards can be Better – a Manifesto*, January 2009; Michael Pirson and Shann Turnbull, "Corporate Governance, Risk Management, and the Financial Crisis: An Information Processing View", *Corporate Governance: An International Review*, vol 19, September 2011

219 Robert Thomas, Michael Schrage, Joshua Bellin and George Marcotte, *op cit*

220 The findings of the review were based on the responses to questionnaires from FSB member jurisdictions and from the 36 banks and broker-dealers that FSB members deemed as significant for the

purpose of the review. See FSB, *Thematic Review on Risk Governance Peer Review Report*, February 2013

221 Robert Thomas, Michael Schrage, Joshua Bellin and George Marcotte, *op cit*

222 R. Fahlenbrach and R.M. Stulz, "Bank CEO incentives and the credit crisis", *Journal of Financial Economics*, vol 99, 2011

223 Patrick Bold, Jose Sheinkman and Wei Xiong, "Executive Compensation and Short-Termist Behaviour in Speculative Markets", *Review of Economic Studies*, vol 73, 2006

224 Baixiao Liu and John McConnell, "The Role of the media in Corporate Governance: Do the media influence managers' capital allocation decisions?", *Journal of Financial Economics*, Vol 110, October 2013

225 Results were based on managers of publically traded US corporations, using 636 proposed merger and acquisitions with a minimum transaction value of \$100 million

A number of tools to reform executive remuneration and ensure that the incentives of executives align not only with shareholders but with financial stability, more broadly, are being discussed. These examples aim to “*delay the ability of senior management to liquidate equity positions for relatively long periods of time*”.²²⁶ They include such options as restricted stock or to ensure that management have ‘skin in the game’, such as through payment in contingent convertible bonds (CoCos) or claw-back periods or gating of bonus repayment, such as those suggested by the Bank of England.²²⁷

Shareholder activism

In a research paper by Kahan and Rock, the importance of ‘shareholder power’ is highlighted, as is ‘the separation of ownership and control’. A distinction is made between ‘symbolic’ and ‘meaningful’ shareholder activism. Their study suggest that most shareholder activism today is symbolic in nature, since symbolic shareholder activism costs less, yet still has indirect impacts on corporate governance through education and awareness. Importantly, symbolic action can act as a reminder that directors/managers are accountable to shareholders, shifting the power balance.²²⁸

However it is not clear that shareholder activism in and of itself would lead to better outcomes for a firm. One study found that firms with an influential shareholder contingent²²⁹ actually performed worse, compared to other firms, during the crisis,²³⁰ because activism creates an opportunity cost for board decision making. Similarly, boards spend time on activist issues that could be spent on strategic decisions for the good of the company.

Effective shareholder engagement can enhance corporate governance and should be facilitated and encouraged, though whether this should be executed through regulation is still open to debate.

Some argue that regulation can lead to shareholder apathy. Shareholder apathy stems from the fact that individual holders are not interested in any given company since they have a small, insignificant holding. Consequently, the costs outweigh the benefits of monitoring.²³¹ Regulation reinforces this through such requirements as limitations on “acting in concert”.²³²

However, with the rise of institutional investors this equation can change somewhat. More and more professional intermediary investors (such as pension funds) are owning equity stock and expressing a voice in the internal governance of a corporation, the response in some jurisdictions has been to introduce a code of conduct for investors to promote engagement in how the company is run. For example, the UK stewardship code states that investors should monitor their investee entity, exercise their voting rights and, where appropriate, be willing to engage other shareholders and act collectively for the good of all shareholders.²³³ Furthermore, an EU action Plan aims to increase transparency on the voting records of institutional investors.²³⁴

Internal Risk and Quality Controls

The G30 report on governance notes that during the recent financial crisis, a number of financial firms displayed an inability to “accurately gauge, understand, and manage their risks” and that “they did not understand their vulnerability to major shocks or they failed to act with appropriate prudence.”²³⁵ For instance, the collapse of Lehman Brothers is attributed in large part to the lack of integrated risk management systems.²³⁶ In addition to insufficient internal risk controls,²³⁷ moral hazard issues (such

231 Julian Velasco, “Taking Shareholders rights seriously”, *UC David law Review* 41, no. 2, 2007

232 ESMA has just released a directive (2013/1642) that outlines a number of activities that shareholder can cooperate on within there being an assumption of acting in concert.

233 Financial Reporting Council, *The UK Stewardship Code*, 2012

234 European Commission, *European company law and corporate governance - a modern legal framework for more engaged shareholders and sustainable companies*, 2012

235 G30, *Toward Effective Governance of Financial Institutions*, April 2012

236 See SFC, *Hong Kong, G-SIFIs: Trends in Risk and Risk Mitigation*, December 2013

237 See C. Lawton and S. Nestor, *Bank Boards after the Flood*, October 2010.

226 Gregg Polisky and Andrew Lund, “Can Executive Compensation Reform Cure Short-Termism”, *Issues in Governance Studies*, no. 58, March 2013

227 Bank of England, *Clawback*, Consultation paper 6/14

228 Marcel Kahan and Edward B. Rock, “Symbolic Corporate Governance Politics”, *U. of Penn Inst for Law & Econ Research Paper*, no. 14-6; NYU Law and Economics Research Paper no. 14-07, January 2014

229 Based on the corporate governance quotient from RiskMetrics

230 Beltratti, A., and R.M. Stulz, “The credit crisis around the globe: Why did some banks perform better during the credit crisis?”, *Journal of Financial Economics*, 2011

as too-big-to-fail) are also pointed to as eroding the willingness of owners and debt holders to push for good governance and risk management.²³⁸ Other cases that have been documented include AIG, Citibank and JP Morgan's "London Whale" episode:

- > Some commentators note that the unravelling of AIG is attributable to 'inadequate liquidity', which is theorised to have manifested due to miscalculation of AIG Financial Products London operations.²³⁹ AIG's CEO Sullivan stated that "*he knew virtually nothing about the insurance company's vast exposure to complex financial insurance products until the credit crunch sparked early signs of a meltdown at the near bankrupt firm*".²⁴⁰
- > In the case of Citigroup, the CEO did not have insight into the very sizable risky positions on mortgage securities.²⁴¹

In the case of JP Morgan's London Whale, a modification in the VAR model led to an inaccurate understanding of risk and delayed identification of the rapidly snowballing size of risk positions as the market moved against the London Whale.²⁴²

While a number of financial firms prior to the crisis had some form of risk committee, members of risk committees met infrequently, did not house enough expertise or have independent members and did not have any voice/power to effect changes in risk behaviour (*i.e.* were ignored by other parts of management/board).²⁴³ For firms that designated chief risk officers (CROs), a distinction in risk management performance prior to the crisis emerged

based on how the CRO sat in the firm's hierarchy. A paper by Aebi, Sabato and Schmid notes that during the financial crisis, banks where the CRO reported to the board performed better (higher stock returns) compared to firms where the CRO reported directly to the CEO. Based on the results of this study, simply having a chief risk officer is not, on its own, enough to make a difference. The CRO must have a legitimate and influential role in the running of the company.²⁴⁴

A purely quantitative view of risk management can also lead to insufficient internal risk controls. Anecdotal evidence suggests while Basel I and II assisted in bringing risk management to the forefront of financial institutions, they may also have led to excessive focus on monitoring and escalation of routine quantitative metrics. This may have caused risk managers to lose sight of the importance of focusing on future risks, including tail risks, emerging risks and risks with changes in probability and/or impact due to external or internal factors, events and circumstances. Prior to the crisis, firms focused on regulatory capital ratios (e.g. Basel II capital requirements) and on the rate of return on equity, neither of which reflected the build-up of leverage and of risk positions.²⁴⁵

Poor risk control and quantitative risk control are exacerbated by weak information technology and data architectures. Insufficient technology/data architecture can preclude the rapid calculation of global risk exposure of the financial institution. As the BIS observed "*One of the most significant lessons learned from the global financial crisis that began in 2007 was that banks' information technology and data architectures were inadequate to support the broad management of financial risks*".²⁴⁶ Without proper risk calculation, risks can build-up unnoticed and can, in the case of stress or tail events, spread easily through the financial system – as was seen in the financial crisis.

238 V. Acharya, T. Philippon, M. Richardson and N. Roubini, "The financial crisis of 2007-2009: Causes and remedies", in: V. Acharya and M. Richardson (Eds.), *Restoring financial stability*, New York: John Wiley & Sons, 2009

239 Jonas Prager, "The Financial Crisis of 2008/8: Misaligned incentives, Bank mismanagement, and Troubling Policy Implications", *Presentation at the Austrian Colloquium*, 30 April 2012.

240 The Guardian, June 30, 2010.

241 Eric Dash and Judith Creswell, "Citigroup Saw No Red Flags Even as It Made Bolder Debts," *The New York Times*, November 22, 2008.

242 "Visionary Board Leadership" <http://www.risk.net/operational-risk-and-regulation/news/2295749/jp-morgan-fined-usd920m-over-woefully-deficient-london-whale-controls>.

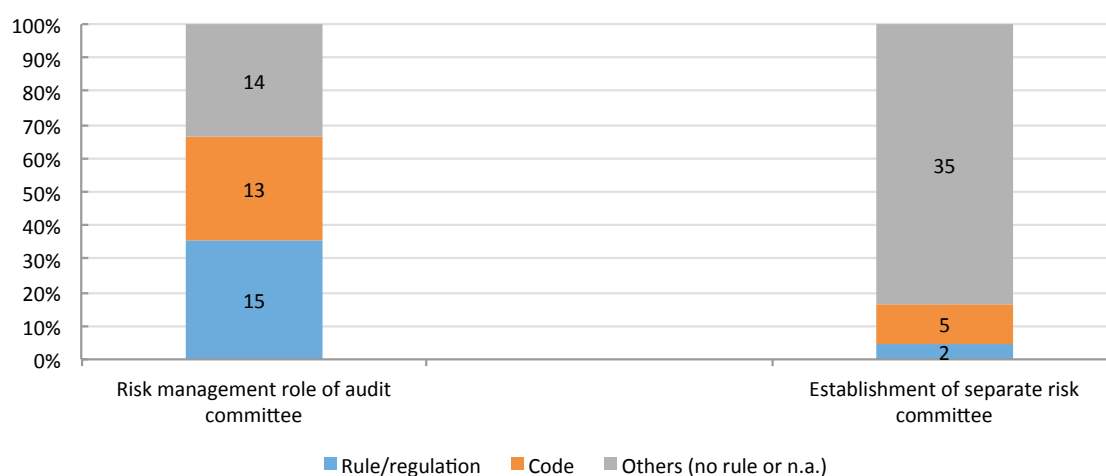
243 A. Mongiardino and C. Plath, "Risk governance at large banks: Have any lessons been learned?" *Journal of Risk Management in Financial Institutions*, vol 3, 2010; H. Hau and M.P. Thum, "Subprime crisis and the board (in-)competence: Private vs. public banks in Germany", *CEISifo Working Paper No. 2640*, 2010

244 Vincent Aebi, Gabriele Sabato and Markus Schmid, *Risk Management, Corporate Governance, and Bank performance in the Financial Crisis*, April 2011

245 Lawton and Nestor, *op. cit.*

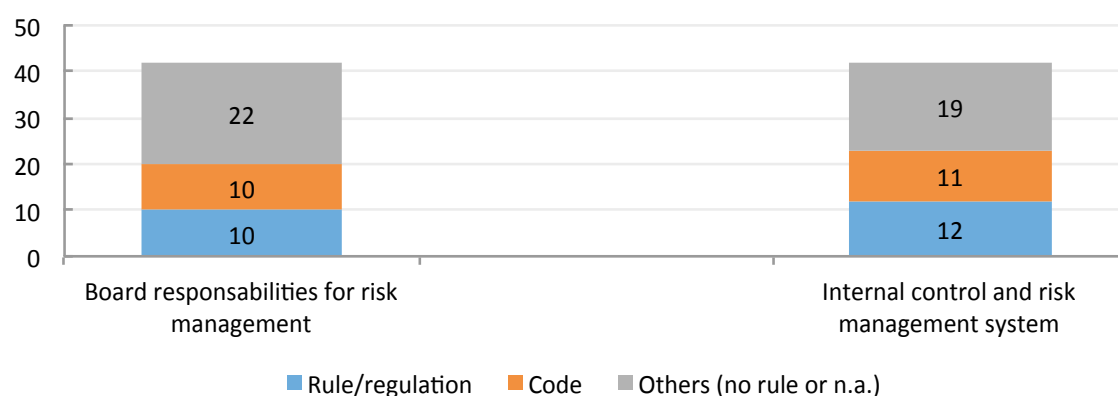
246 See BCBS, *Principles for effective risk data aggregation and risk reporting*, January 2013. Without proper risk calculation, risk can easily spread through the financial system. The collapse of Lehman Brothers is viewed to have resulted in large part from the lack of integrated risk management systems.

FIGURE 109: BOARD-LEVEL COMMITTEE FOR RISK MANAGEMENT (NO. OF JURISDICTIONS)



Source: OECD

FIGURE 110: GOVERNANCE OF INTERNAL CONTROL AND RISK MANAGEMENT (NO. OF JURISDICTIONS)



Source: OECD

As a consequence of these failures, enhanced risk governance has become a top consideration for boards of financial institutions. Financial institutions are establishing risk committees that report directly to board level. Audit committees or separate risk committees are being given this role (see Figure 103).²⁴⁷ Also board-level committees on audit, nomination and remuneration have increased (see Figure 109 and Figure 110).

A study by the Hong Kong Securities and Futures Commission (SFC), which involved interviews with the top management of ten global systemically important

financial institutions (G-SIFIs),²⁴⁸ revealed that most financial institutions have reviewed their Key Risk Indicators (KRIs), risk limits and internal escalation mechanisms with the aim of ensuring that the failures of the past do not repeat themselves in the future.

CROs interviewed for the report emphasised the importance of a clearly formulated risk appetite statement (RAS).²⁴⁹ The report quotes a CRO who elaborated that such a RAS can “*create empowerment for the risk functions by constraining the operational legs of*

248 See FSB, *Update of group of global systemically important banks*, November 2012

249 See also FSB, *Principles for an Effective Risk Appetite Framework*, November 2013

247 OECD, *Corporate Governance Factbook*, February 2014.

the organisation.”²⁵⁰ In the same study, the Hong Kong SFC observed the following additional trends in the risk governance of G-SIFIs: including greater stature, authority, independence and executive engagement of the risk functions and closer proximity of risk functions to the business units.²⁵¹

Nevertheless, the study observed room for improvement and was sceptical of how many financial institutions “have achieved truly integrated enterprise risk management”.²⁵² The report observed that management reporting remained complex, fragmented and manual in nature, and reliant on a series of different systems, programs and inputs dispersed through a firm’s organizational structure covering an entire firm structure. This complexity makes it difficult for management to grasp a wide and real-time picture of the risk exposure of their firm. Finally, the SFC study noted that only a few G-SIFIs have an emerging risk committee.²⁵³

These findings are somewhat in line with a survey by Hashagen *et al.* of 500 senior managers globally. The study notes that the status of risk management continues to flounder in the post-crisis period, with 76% of risk managers questioning the influence of risk governance in banks and less than half expressing doubts over the ability of boards to handle risks.²⁵⁴

While investigation into corporate culture is still a new and evolving field of study, the two recent papers by the Hong Kong SFC and the FSB have sought to add further definition to continued monitoring and future improvements. The SFC study suggests one way to observe risk culture by proxy is to concentrate on the

“tone at the top”.²⁵⁵ Also identifying the interplay of incentives set within a firm, whether they are rewards for “good behaviour” or penalties for “bad behaviour” can shed light on the risk culture of a firm. This is referred to as “consequence management”.²⁵⁶

The FSB report *Framework for Assessing Risk Culture*²⁵⁷ includes similar observations, but adds that “mechanisms should be in place, such as talent development, succession planning, and confidential 360-degree review processes, to ensure that decision-making is not dominated by any one individual or small group of individuals in a manner that is detrimental to the interests of the institution as a whole.” The FSB also notes that the “senior management should be subject to the same expectations for integrity, risk governance, and risk culture as all other employees.”

Going forward

There has been much research and analysis in the context of corporate governance, but there does not seem to be a single model of success when it comes to mitigating the build-up of systemic risk.

Efforts to mitigate risks around corporate governance issues will require a multifaceted, integrated approach including: the composition of the board and the quality of the personnel tasked with the day-to-day operation of the firm; the adequacy of internal risk management, and quality controls; and finally, shareholders ability to monitor and influence those entrusted to manage their ownership. From a regulatory perspective, a better understanding of how incentives and internal structures within firms interact and contribute to the build-up of systemic risk will help.

Although financial institutions have increased their focus on the internal monitoring of risk and the communication toward other stakeholders, outstanding issues remain. Emphasis is now on the need for a visionary board capable of providing the stewardship to ensure that solid corporate governance frameworks and an effective risk culture are in place throughout a

250 Excerpt from SFC Hong Kong, *G-SIFIs: Trends in Risk and Risk Mitigation*, December 2013 (pg 20). The report goes on to note that “to achieve a risk appetite statement that is broad enough to cover enterprise-wide risk, this CRO noted the need for increasing collaboration with other risk functions and disciplines such as compliance (in relation to, for example, conduct and reputational risks), legal (in relation to for example litigation risk and risks related to contractual terms) and treasury (in relation to for example funding liquidity risk).”

251 See SFC Hong Kong, *G-SIFIs: Trends in Risk and Risk Mitigation*, December 2013

252 SFC *Op cit.*

253 The SFC report notes “While risks which must be tracked under Basel III and other global rules are often quantifiable, emerging risks are usually not because of insufficient data on size and probability. Once identified, emerging risks can be fed into other risk management processes such as operational risk assessments and stress testing.” Reverse stress testing processes can be used to assess how an emerging or extreme risk could affect the G-SIFI.

254 J. Hashagen, N. Harman, M. Conover and J. Sharma, “Risk management in banking: Beyond the credit crisis”, *Journal of Structured Finance*, vol 15, 2009

255 The SFC report notes that “Tone at the top refers to the actions of senior management when it comes to emphasising the importance of honesty, integrity and effective risk governance to the long term viability of the organisation.”

256 Definitions lifted from the Hong Kong SFC *op.cit.* Other risk related terms used in this Chapter have the meanings set out in the Financial Stability Board (FSB) Thematic Review on Risk Governance.

257 See FSB, *Framework for Assessing Risk Culture*, April 2014 http://www.financialstabilityboard.org/press/pr_140407.htm

firm, aside from tackling the traditional market, credit, operational and reputation risk. Furthermore, there is a growing realisation that all areas of risk must be presented to the board and executive committee in a succinct and comprehensible format, thus engendering the need for more solid enterprise risk management functions.

These areas and their relation to sound risk governance and an effective risk culture warrant continued research in the future.

PART 3

OTHER RISKS AND RISK IDENTIFICATION WORK

Geo-political risks

Over the last year or so, securities markets have moved in reaction to the changing geopolitical scenarios around the globe. According to the IMF, geopolitical risks related to Ukraine could pose a major threat to the global financial stability due to its spill-overs and increased risk aversion coupled with disrupting trade and finance, extending beyond the immediate neighbours. Political risks in Thailand, Argentina and Turkey could also be a threat to the stability of financial markets, if they were to escalate.²⁵⁸ Securities markets [in these countries] have been affected by shocks in asset prices, reversal of capital flows, depreciation of currencies, and rises in interest rates in many jurisdictions. Furthermore, asset prices outside of these countries were also affected. More globally, firms postponed temporarily initial public offerings and issuances of corporate bonds. While geopolitical developments are out of control of securities markets regulators, their resonance is instantly transmitted through securities markets and many times end up in affecting the global economy.

Virtual currencies

In the course of 2013 and the beginning of 2014 the attention for alternative virtual currencies, with Bitcoin as the best known, grew. Certain regulators became increasingly worried about the spread of the use of alternative currencies as measured by the number of transactions. Central banks in particular investigated the creation, the functioning and use of these currencies from a monetary stability

perspective. Certain securities markets regulators analysed the use of alternative virtual currencies from the perspective of how they are or could be used in securities transactions, in particular as an object of acquisition or investment in different ways (through directly mining, or through IPO, crowdfunding or capital issuing, dividend distribution, ETFs, CFDs, underlying derivatives etc.). Questions of whether securities dominated in bitcoin or investments in bitcoin are covered by existing regulation or not, and, if not, whether they should be regulated by securities markets regulators, are still being debated.

Indeed, not only is the legal status of virtual currencies quite unclear and heterogeneous among various jurisdictions (are virtual currencies properties, financial instruments, securities or assets?), so too the mandate of public authorities to put virtual currencies at an appropriate (and probably higher) level in their regulatory agenda for consumer and investor protection purposes:

- > On the one hand, virtual currencies may propose lower commission rates for payment than traditional banking cards and/or a potentially attractive image in terms of purchasing power or long-term stability compared with well-established currencies, due to the fact that digital currencies are neither subject to the inflation tax, nor dependant from other unattended consequences of unconventional monetary policies.
- > On the other hand, however, investors have to be fully aware of the wide range of risks they are exposed to by using virtual currencies: volatility of their value (market risk), absence

258 IMF, *Global Financial Stability Report*, April 2014

of any legal protecting framework, operational risks for trading platforms, etc.

- > Furthermore, certain securities markets regulators have expressed concerns regarding the risk of money laundering and terrorist financing which due to the anonymity of the bitcoin virtual use could be greater than in traditional financial transactions.
- > Finally, the virtual currency phenomenon may warrant analysis from a potential systemic risk perspective.

At the time of writing, the spread of the use of bitcoin in securities markets has been interrupted by warnings released by some authorities as well as severe trading problems at bitcoin exchanges; this may diminish the risk and urgency of the analysis for the moment.

Security and operational risks arising from increasing dependence on technological infrastructure

Securities markets are increasingly reliant on technological infrastructure – for storing critical information, receiving critical information, monitoring and other important transactions and processes. Technology can make markets smarter, faster and more efficient. It can also support innovation and the growth of new financing channels such as peer to peer lending and crowdfunding. At the same time, increasing reliance on technology exposes financial markets to new security and operational risks, including:

- > Cyber-attacks;
- > Reputational issues from the easy dissemination of false information.
- > Software malfunctions; and
- > Lack of proper system maintenance and discontinued support for legacy systems.

IOSCO has undertaken work to identify and mitigate risks arising from these vulnerabilities (see *Introduction*). In the case of cyber-attacks, a recent survey by Price Waterhouse Coopers revealed that

40% of financial sector respondents had suffered cyber-attacks, compared to an average of 17% in other industries. For securities markets in particular, an IOSCO joint staff working paper with the World Federation of Exchanges noted that more than half of exchanges responding to a cyber-crime survey noted having suffered cyber-attacks in 2012-2013. Other examples of cyber-crime targeting a variety of securities markets actors have also been noted over the last year. For example, the Chicago Mercantile Exchange (CME), a central clearing house, suffered a cyber-attack in 2013, which resulted in exfiltration of customer data. Also last year, an unnamed hedge fund was a victim of malware, which infiltrated its high frequency trading system and stole trading information.

Connected to cyber-attacks is the issue of false information. The internet provides numerous avenues for cyber-criminals to spread false information, with material impact on financial markets and firms. For example, last year the Syrian Electronic Army hacked the Associate Press Wire's Twitter account to falsely announce an attack on the White House. This had a temporary impact on the stock market. This year, Bulgarian banks experienced a run due to panic brought about by false text messages and emails sent to customers. These false messages were aimed at undermining confidence in the health of the banking system.

Software malfunctions can also have material impact on firms and securities markets activities. In 2012, brokerage firm Knight Capital Group lost \$440 million due to a computer-trading malfunction. The malfunction caused the firm to enter into bad trades. The impact on the company's stock was material, with its stock dropping more than 50% on the day the malfunction was revealed. Eventually the firm was acquired. This year, a system malfunction at NYSE Liffe disrupted trading of futures contracts for four hours. This malfunction impacted money markets linked to the euro interbank offered rate (Euribor) and euro overnight index average (Eonia).

Lastly, inadequate system maintenance can increase the vulnerability of financial market actors to technologically-related risks. Computer software

and configurations must be routinely reviewed and updated to ensure that newly identified problems and vulnerabilities are addressed. If not addressed, vulnerabilities may be exploited by hackers to gain access to a system and its data. Fixes and patches need to be deployed to computer systems quickly to minimise the window of opportunity for attackers. However, implementation of patches may cause disruption or inadvertently break other applications.

Legacy systems, or computer software/hardware for which technical support offered by the provider is discontinued, represents a similar threat. Technical support offered by the provider often is discontinued after a time. This creates difficulty in maintaining the system, making it more vulnerable to technological glitches and cyber-attacks. Alternatively, replacing

the software can be extremely costly. The extent that legacy software is used throughout the financial system was made clear this year when Windows announced discontinued support for Windows XP, as a majority of ATMs around the world are powered by Windows XP.

Financial stability can be undermined by the manifestation of technological risks in securities markets, as well as other financial sectors. The impacts of technological risk could undermine confidence in the markets, potentially making capital-funding by firms more difficult. As such, continued monitoring and mitigation of technological risks to securities markets has become a fundamental aspect of systemic risk mitigation.

Box 6: AMCC Risk Identification

The AMCC is made up of regulatory SROs and other market stakeholders. The AMCC's broad focus on risks covers risks leading to systemic turmoil but also those that may undermine market integrity, impair investor protection, or erode regulators' credibility. To do this work, the AMCC has recently established a Task Force on Emerging Risks to assist the IOSCO Research Function in its work on emerging and known risks in today's securities markets. The AMCC categorises risks in three ways:

1. Ongoing or emerged risks
2. New and emerging risks
3. Potentially systemic risks

Many of the ongoing or emerged risks are inherent in investing, e.g. credit risk, market risk, exchange rate risk, and product complexity, some or all of which investors may not fully understand. Risks in this category could relate to issues such as suitability, the treatment of ageing investors, and basic fraud. While these issues are recurrent, specific market, economic or demographic changes are increasing the need for greater attention to these matters.

New and emerging risks can relate to the structure and operation of the markets and the conduct of market participants, and how regulators respond to these challenges. These risks can relate to how technology influences market structure and trading, conflicts of interest, and unregulated or under-regulated entities and products. The lack of adequate regulatory powers or regulatory cooperation, including cross-border aspects, may also pose or exacerbate this type of risk.

Systemic risk is a broad risk category relating to risks that could jeopardize the stability of financial and securities markets. Among the top risks for securities markets and regulators to consider from a financial stability perspective are High Frequency Trading, reliance on quantitative trading models, herding, technology-related issues, volatility of ETFs, and cybercrime.

While the AMCC's approach to identifying risks may be more specific and market-based compared to those taken or identified by the Research Function -- which focuses mainly on vulnerabilities in securities markets that may trigger systemic issues -- the AMCC is able to contribute and join-up its work with the wider, more global perspectives of the greater IOSCO community.

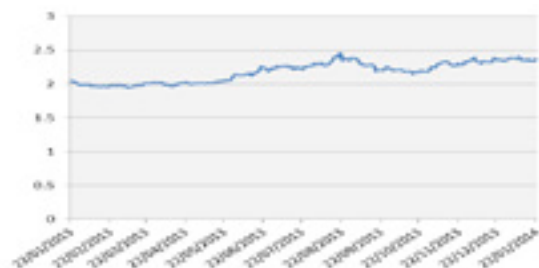
The AMCC recognizes that merely identifying risks is useful, but not adequate. The next step is to identify risk mitigation strategies which includes such things as raising awareness among regulators, self-regulators, the industry and the public at large, as well as developing sound practices, recommendations or other policy work. This is the challenge going forward.

ANNEX 1 CURRENCY RATES OF SELECTED EMERGING MARKETS

FIGURE 111: CURRENCY RATES (AGAINST US\$)

Most of the selected emerging economies saw their currencies depreciate after the tapering announcement...

Brazil (BRL)



South Africa (ZAR)



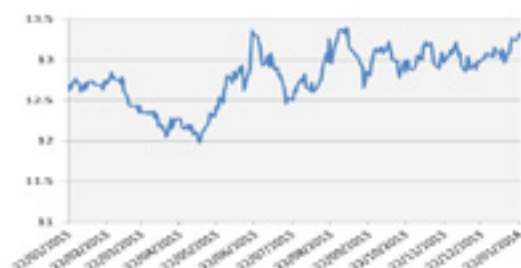
Turkey (TRY)



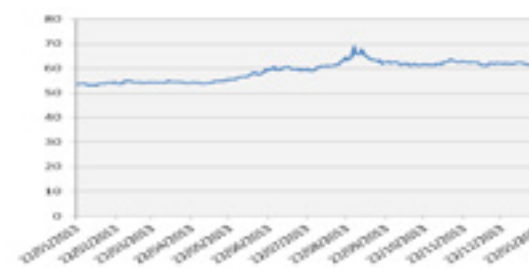
Chile (CLP)



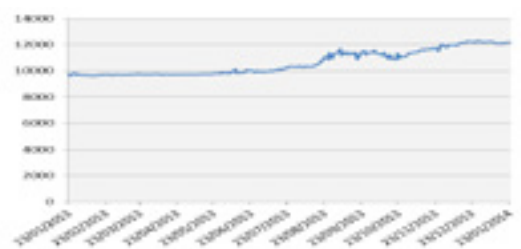
Mexico (MXN)



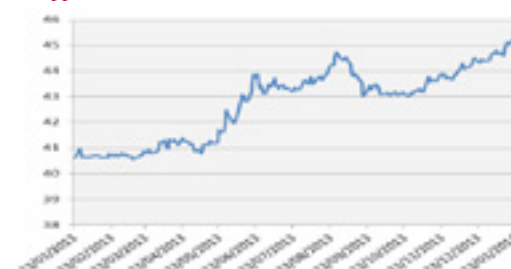
India (INR)



Indonesia

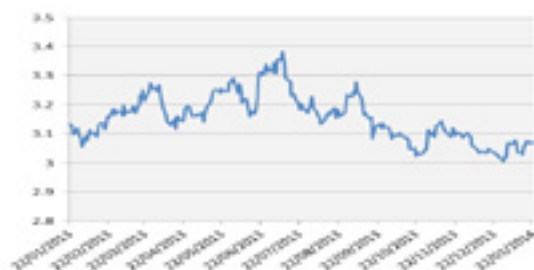


Philippines



...while the Renminbi continues its upward trend and Poland and Hungary seem to benefit from early signs of economic recovery in the Eurozone.

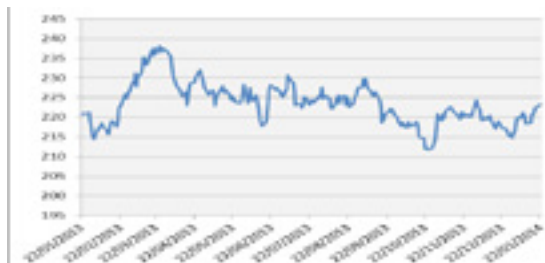
Poland (PLZ)



China (RMB)



Hungary (HUF)

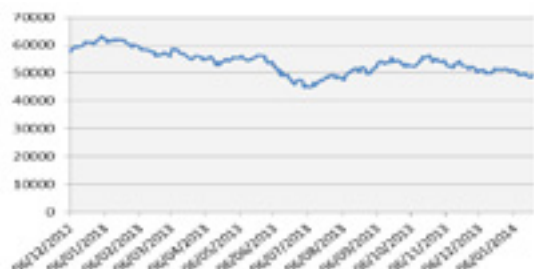


Source: Bloomberg

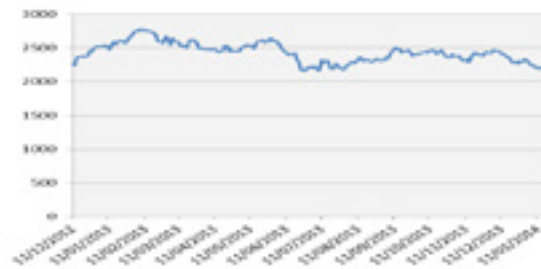
Note: Y-Axis in %; Note: Red marker indicates May 22 tapering announcement

FIGURE 112: WORLD EQUITY INDICES – SELECTED COUNTRIES

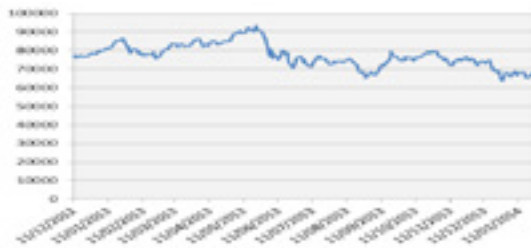
Brazil (IBOVESPA)



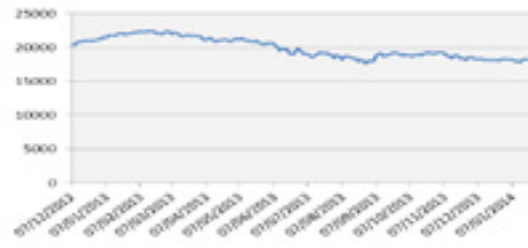
China (SHSZ300 Index)



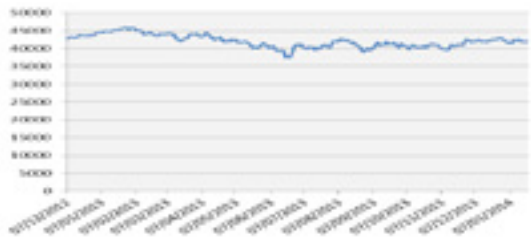
Turkey (BIST National 100)



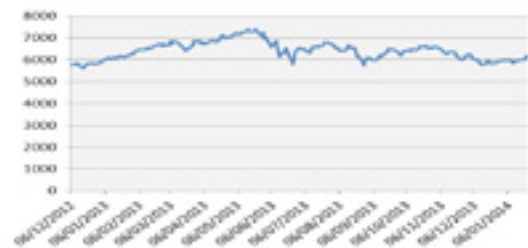
Chile (Sant. SE IGPA Index)



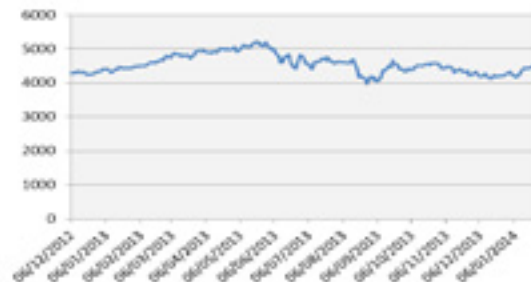
Mexico (IPC)



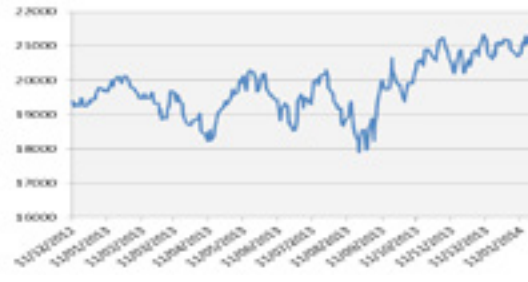
Philippines (PSEi)



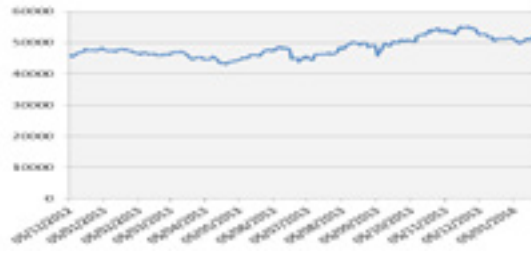
Indonesia (Jakarta Comp)



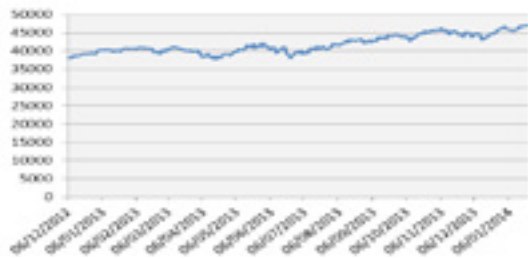
India (SENSEX Index)



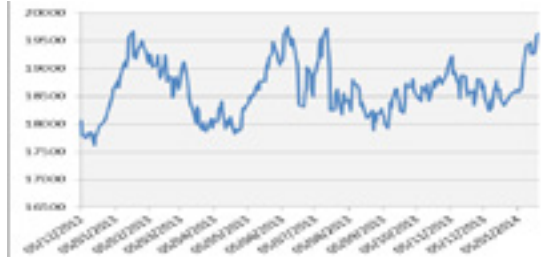
Poland (WIG Index)



South Africa (FTSE/JSE All Share)



Hungary (Budapest Exchange)



Source: Bloomberg

Note: Y-Axis in US\$; Note: Red marker indicates May 22 tapering announcement

ANNEX 2: SUMMARY OF GLOBAL POLICY WORK ON CCPs

In 2009, the Leaders of the G-20 agreed at the Pittsburgh Summit that all standardised OTC derivatives contracts should be cleared through CCPs by year-end 2012. As such, there has been much international policy work to facilitate an effective and risk sensitive implementation of this G-20 mandate. What follows below is a summary of the work being currently undertaken.

To monitor progress of the reforms in the jurisdictions, the FSB established the OTC Derivatives Working Group (ODWG). ODWG drafts progress reports semi-annually, with the FSB's most recent report *OTC Derivatives Market Reforms Seventh Progress Report on Implementation*²⁵⁹ published in April 2014. The FSB, in its October 2010 Report *Implementing OTC Derivatives Market Reforms*,²⁶⁰ recommended that IOSCO, working with other authorities as appropriate, should coordinate the application of central clearing requirements on both a product and a participant level. IOSCO published the work of its Task Force on OTC Derivatives Regulation, *Requirements for Mandatory Clearing* in February 2012,²⁶¹ which included seventeen recommendations and outlines steps that authorities should take to establish effective mechanisms for monitoring compliance with mandatory clearing requirements.

On the use of CCPs to mitigate counterparty risk, the CPSS-IOSCO *Principles for Financial Markets Infrastructures*²⁶² ("PFMIs", April 2012) included updated and strengthened risk management standards applicable to financial market infrastructures (FMIs)²⁶³ deemed systemically important, including CCPs. CPSS-IOSCO also finalised the qualitative disclosure framework and assessment methodology

for the PFMIs in December 2012.²⁶⁴ Some CPSS and IOSCO member jurisdictions have already adopted the PFMIs into their legal and regulatory framework while others are considering such standards as part of their regulatory, supervisory, and oversight activities. FMIs will be expected to manage their risks to promote their safety and, more broadly, financial stability.

CPSS and IOSCO are monitoring the implementation of the PFMIs, including the Principles for FMIs and the relevant Responsibilities for the authorities (e.g., the regulator or overseer of the FMI). To this end, CPSS-IOSCO has established a Task Force to carry out the monitoring process which has three levels:

- > Level 1: A self-assessment conducted by each jurisdiction to determine whether the jurisdiction has completed the process of adopting the legislation and other policies that will enable it to implement the Principles and the Responsibilities. The first Level 1 Assessment was conducted in mid-2013 and involved the participation of 27 jurisdictions. The self-assessments were reported in the Level 1 Assessment Report which was published in August 2013.²⁶⁵ An update to the Level 1 Assessment was published in May of 2014 and involved the participation of 28 jurisdictions.²⁶⁶ The update report aimed to capture new measures that the jurisdictions had implemented since the publication of the initial Level 1 Assessment report in August 2013.
- > Level 2: An assessment by the Task Force to determine whether the content of the legal and regulatory framework applied in each jurisdiction is consistent with the Principles and is complete. The first round of this

259 http://www.financialstabilityboard.org/publications/r_130415.pdf.

260 http://www.financialstabilityboard.org/publications/r_101025.pdf.

261 <https://www.iosco.org/library/pubdocs/pdf/IOSCOPD374.pdf>.

262 <http://www.bis.org/publ/cpss101a.pdf>.

263 FMI types include trade repositories ("TRs"), central securities depositories ("CSDs") and securities settlement systems ("SSSs"), payment systems ("PSs") and CCPs.

264 <http://www.iosco.org/library/pubdocs/pdf/IOSCOPD396.pdf>. Work is progressing on a quantitative disclosure framework

265 <http://www.bis.org/publ/cpss111.htm>.

266 Additional rounds of updates to the Level 1 Assessment are scheduled to occur through 2015 or until such time that all CPSS-IOSCO member jurisdictions have fully implemented the PFMIs.

detailed peer-review evaluates whether the adopted measures are complete and consistent with the Principles for CCPs and TRs in the European Union, Japan and the United States.²⁶⁷ The Level 2 Assessment is currently in progress. The Level 2 Assessment Report concerning this first round is expected to be published by the end of 2014. The Level 2 Assessment of the remaining jurisdictions and remaining FMI types (CSDs/SSSs and PSs) is expected to occur in subsequent rounds through 2016. In addition, a Level 2 Assessment for the Responsibilities is expected to be conducted in 2015.

- > Level 3: An assessment by the Task Force to determine whether there is consistency in the outcomes of implementation of the Principles and Responsibilities. Level 3 Assessments are expected to begin in 2015.

CPSS and IOSCO have been developing guidance on recovery planning of FMIs. The FSB also has been developing a document which contributes to the implementation of the Key Attributes in relation to resolution regimes for SIFIs, including FMIs. The CPSS-IOSCO guidance on FMI recovery was published for consultation in August 2013²⁶⁸ and a final report will be published later this year.

With regard to transparency, Principle 23 of the PFMI, states that FMIs “should provide sufficient information for participants [and prospective participants] to have an accurate understanding of the risks, fees, and other material costs of participating in the FMI.” An FMI should adopt and disclose written rules and procedures that are clear and comprehensive and that include “explanatory material written in plain language.”²⁶⁹ In addition, an FMI should complete and publicly disclose its responses to the CPSS-IOSCO Disclosure

framework for financial market infrastructures.²⁷⁰ Specifically with regards to quantitative data, Principle 23, Key Consideration 5 states that “at a minimum, FMIs should disclose basic data on transaction volumes and values.” FMIs should also disclose their “financial condition, financial resources to withstand potential losses, timeliness of settlements, and other performance statistics.”²⁷¹ CPSS and IOSCO are also in the process of finalising public quantitative disclosure standards for CCPs that will establish a common set of such basic data on transaction volumes and values, and provide detail on a common minimum set of quantitative information on CCP financial condition, financial resources, and performance.²⁷²

Bank capital requirements are being used to create strong incentives to adopt requirements that are consistent with the PFMI. In July of 2012 the Basel Committee on Banking Supervision (BCBS) published the “Capital Requirements for Bank Exposures to Central Counterparties” (“Interim Capital Standards”), which set forth interim standards governing the capital charges arising from bank exposures related to OTC derivatives, exchange traded derivatives, and securities financing transactions.²⁷³ The Interim Capital Standards created financial incentives for banks, including their subsidiaries and affiliates, to clear derivatives with CCPs that are qualifying CCPs (“QCCPs”). A QCCP is an entity that, among other, is prudentially supervised in a jurisdiction where the relevant regulator has established and publicly indicated that it applies to the CCP on an ongoing basis, domestic rules and regulations that are consistent with the PFMI. The capital charges for exposures to non-QCCPs are significantly higher than the capital charges for exposures to QCCPs.

267 The selection of jurisdictions and FMI types was based on the consideration of the roles CCPs and TRs in the context of over-the-counter derivatives market reforms and the location of the major global CCPs and TRs.

268 <http://www.bis.org/publ/cpss109.htm>.

269 CPSS-IOSCO (2012): “Principles for Financial Market Infrastructures”, Principle 23, Explanatory note 3.23.1.

270 CPSS-IOSCO (2012): “Principles for Financial Market Infrastructures”, Principle 23, Key Consideration 5.

271 CPSS-IOSCO (2012): “Principles for Financial Market Infrastructures”, Principle 23, Explanatory note 3.23.8.

272 In October 2012, CPSS and IOSCO published a consultative report regarding the *Public quantitative disclosure standards for CCPs*. <http://www.bis.org/press/p131015a.htm>. CPSS and IOSCO are in the process of finalizing changes to the report in light of the received comments.

273 <http://www.bis.org/publ/bcbs227.pdf>.

The Joint Working Group on CCPs, composed of representatives from relevant BCBS, CPSS, and IOSCO committees, was established in light of the issues identified with the initial approach for calculating capital charges for bank exposures to CCPs clearing derivatives and securities financing transactions. This Committee sought to improve upon the Interim Capital Standards published in July 2012, and a final report was published in April 2014 (“Final Basel Capital Standards”).²⁷⁴ In developing the final standard, the BCBS sought to simplify the interim policy framework and to complement relevant initiatives undertaken by other supervisory bodies, including the PFMI. It also aimed to support broader policy efforts advanced by the G-20 Leaders and the FSB, particularly those relating to central clearing of standardised OTC derivative contracts. Like the Interim Capital Standards, the Final Basel Capital Standards distinguish between exposures to QCCPs and non-QCCPs. In other words, both sets of standards create financial incentives for banks, including their subsidiaries and affiliates, to clear derivatives with QCCPs.

274 <http://www.bis.org/publ/bcbs282.htm>. The Final Basel Capital Standards are effective on 1 January 2017.

ANNEX 3 CCPs AND THEIR METHOD OF MARGIN CALCULATION

TABLE 6: CCPs AND THEIR METHOD OF MARGIN CALCULATION

CCP	Method of Margin risk calculation	Description	Look back period or History
OCC	System for Theoretical Analysis and Numerical Simulations (STANS)	The margin requirement is obtained from the risk measure known as "99% Expected Shortfall".	Not Available
CME	CME SPAN (A Variance-Covariance Model), HVaR, Multifactor algorithm	CME Clearing employs CME SPAN for listed products, Filtered Historic Value at Risk (HVaR) for OTC IRS and FX, and Multi-Factor Algorithm for OTC CDS.	For OTC IRS, 5 years; For OTC FX and CDS, Unknown
SIX xClear	VaR	SIX xClear operates a 7 day yield VaR for Bonds and Weekly VaR calculations for equities clearing, under difficult market conditions, this can be calculated daily	Not Available
ICE Clear Credit	Multi-Factor Model	ICE Clear Credit uses a Multi-Factor Model for calculating margin for CDS.	Not Available
Eurex	Prisma (in-house model)	The Initial Margin (IM) calculation depends on the product being traded. • OTC IRS - Prisma - Variation Margin, IM • Traditional options - Risk Based - Premium Margin; Additional Margin; Spread Margin (for Spreads); • Futures - Additional Margin (for Non-Spreads) - Risk Based; Futures Options on Futures - Risk Based - Variation Margin; Additional Margin; Futures Spread Margin; • Bonds & Repos - Risk Based - Current Liquidating Margin; Additional Margin; • Equities - Risk Based - Current Liquidating Margin; Additional Margin; • Cash positions - Risk Based - Current Liquidating Margin.	For OTC IRS, 750 days plus a 250 day stress buffer
LCH Clearnet Ltd	London SPAN (A Variance-Covariance Model); Equity Risk Analysis (ERA) (An Historical Simulation Model); Portfolio Approach to Interest Rate Scenarios (PAIRS); Multi-Factor Model; Portfolio VAR	LCH Clearnet Ltd. uses a range of different initial margin methodologies depending on the instrument being cleared. For Exchange Traded derivatives, the methodology used to calculate initial margin is SPAN. For RepoClear, the methodology used to calculate initial margin is SPAN. For SwapClear, the methodology used to calculate initial margin is PAIRS. For EquityClear, the methodology used to calculate initial margin is ERA. For CDS, a Multi-Factor Model is used. For Nodal Exchange, the methodology used is Portfolio VAR.	For OTC FX, 10 years or 2500 business days; For Repoclear, 5 years or 250 business days; For Swapclear, 10 years or 2500 business days
ICE Clear Europe	CME SPAN (A Variance-Covariance Model), HVaR, Multi-Factor Model	The margin methodology is CME SPAN for futures & options and OTC FX contracts. A Multi-Factor Model is used for CDS.	
CME Clearing Europe	SPAN and Historical VaR	CMECE uses CME Standard Portfolio Analysis of Risk (SPAN) for OTC Commodity derivatives. CMECE will monitor current and historical price and volatility movements covering short, intermediate and longer-term data and will establish a margin confidence level of 95% to 99% over varying time-frames. For IRS, CMECE calculates Initial Margin requirements using a HVaR model.	
LCH Clearnet S.A.	Multi-Factor Model	LCH S.A. clears CDS using a Multi-Factor Model.	
SGX-DC	Historical VaR and NPV	Essentially have two methodologies for calculating initial margin. One is based on portfolios using a Historical Simulation Value-at-Risk (HSVaR) methodology; the other is calculated as Net Present Value (NPV) after allowing partial offsets adjusted by a multiplier. The higher figure is charged to the clearing member.	Not Available

TABLE 7: ELIGIBLE COLLATERAL AND AMOUNT OF IM POSTED OF SELECTED CCPs

CCP	Eurex Clearing AG	LCH Clearnet SA	SGX-DC	OCC	LCH Clearnet Ltd	CME Clearing
Initial Margin	• EUR, CHF, USD and GBP • Fixed income in EUR • ECB liquidity classes I-IV • Government and Short-Term Issues (Bubills) Bonds • City and Municipality Bonds • State Agencies • Corporates and other Bonds • Bank Bonds • Fixed income in foreign currencies • Government Bonds in USD, GBP, DKK, NOK, SEK, AUD, CAD, JPY • Fixed income in CHF • Federal Bonds and Bills (GMBF), Loan obligations • Cantonal obligations, Bonds, Bills (GMBF) • CHF City and Municipality Bonds • CHF Corporates and other Bonds • Bank Bonds, Mortgage Bonds (Pfandbriefzentralen), no ABS • DAX®, EURO STOXX 50® • Top 50 HDAX • Specific Equity Collateral	• EUR GBP and USD • French State issued Debt Securities (Nominal value of EUR 100,000) • Treasury Bills (BTfEs) -13,26,52 weeks • Annual Fixed Interest Rate Treasury Notes (BTANs) • Fungible Treasury Bonds (OATs and OATis) (Nominal value of EUR 100,000) • USA issued Debt Securities (Min. value of USD 250,000) • US Treasury Bills (Min. value of USD 250,000) • German Federal State/Treuhandanstalt/ (Min. EUR value of 100,000) • Bunds • British State issued Debt Securities (Min. value of GBP 100,000) • Gilts (Min. value of GBP 100,000) • Belgian State issued Debt Securities (Min. value of EUR 100,000) • Belgian Treasury Certificates (Min. value of EUR 100,000)	• Belgian Linear Bonds (OLOs) (Min. value of EUR 100,000) • Dutch State issued Debt Securities (Min. nominal value of EUR 100,000) • Debt Treasury Certificates (DTCs) • Italian State issued Debt Securities (Minimum value of EUR 100,000) • Treasury Bills (BOTs, BTPs and BTPis) • Portuguese State issued Debt Securities (Minimum nominal value of EUR 100,000) • Spanish State issued Debt Securities (Minimum value of EUR 100,000) • Letras del Tesoro (LET) • Bonos del Estado (BON) • Obligations del Estado (OBE) (Min. value of EUR 100,000) • An index AEX; • An index BEL 20; • An index CAC 40; • A Index DJ EURO STOXX 50 or 100; • An index PSI-20; • Underlying shares of options listed on Euronext derivatives market and cleared by LCH SA;	• Cash – Clearing Members may deposit margin in U.S. dollars in accordance with procedures acceptable to OCC. • US and Canadian Government Securities – Government Securities • US Government-Sponsored Enterprise (GSE) Debt Securities • MMF Shares- No more than 5% of the total number of shares of any one fund will be accepted for deposit by a Clearing Member. • Valued securities – Common and preferred stock, corporate bonds and exchange-traded funds (ETFs). • Letters of Credit – The letters of credit shall be denominated in USD and be issued by banks or trust companies that are approved by OCC. In addition, clearing members can pledge the underlying stock as margin to cover a short equity call option.	• Cash collateral in: GBP, EUR, USD, CAD, CHF, JPY, SEK, DKK, NKK • Government Securities with maturities that range up to 30 years; • Government National Mortgage Association Mortgage Backed Securities (GNMA MBS) which have terms that range from New (0 – 30 months) through to Seasoned (→ 60 months); • Government Agencies and Securities issued under Government Credit Guarantee Scheme which have terms ranging from 3 business days to 30 years; • In Europe: Kreditanstalt für Wiederaufbau (KfW) which have terms ranging from 3 business days to 30 years; • Govt Guaranteed Bonds and CDs which have maturities of 3 business days through to 7 years; • Gold Bullion.	A list of all eligible collateral can be found at: http://www.cmegroup.com/clearing/files/acceptable-collateral-futures-options-select-forwards.pdf
IM Amount posted	Not Available	\$US19,798,000,000 (June 2013)	\$US5,632,000,000 (June 2013)	\$US80,201,000,000 (June 2013)	Not Available	Not Available

Source: Thomas Murray Data Services

TABLE 8: COLLATERAL RE-INVESTMENT AND STOCK LENDING POLICIES OF SELECTED CCPs

CCP	Eurex Clearing AG	LCH Clearnet SA	OCC	LCH Clearnet Ltd	CME Clearing
Re-investment	- Cash investment is on a short-term basis (mainly overnight); - Cash investments are secured to the extent possible (reverse repo is the preferred instrument); - The securities to be deposited have first class credit ratings (minimum security rating of AA-); - The counterparties involved have high creditworthiness (minimum counterparty rating of A-) All interest earned is passed on to the clearing members on a monthly basis, bar a 20-basis-point reduction for EUR and CHF and a 50-basis-point reduction for USD and GBP.	The cash transferred as collateral by a clearing member to LCH SA is invested in liquid assets. LCH SA invests cash funds related to margins and default fund contributions through fixed deposits, swaps, and repo transactions. Cash not invested is deposited in a central bank account, of this 95% was invested in high quality instruments (i.e. governments AA- and above).	• Cash –. Funds that are deposited may partially or wholly be invested by the Corporation for its own account in Government Securities and any interest or gain received shall belong to OCC. • US and Canadian Government Securities –All interest or gain received or accrued prior to sale shall belong to the depositing Clearing Member. On maturity, interest is credited by OCC to the account of the Clearing Member in respect of which the deposit was made. • US Government-Sponsored Enterprise (GSE) Debt Securities- All interest or gain received or accrued prior to sale shall belong to the depositing Clearing Member. On maturity interest shall be credited by OCC to the account of the Clearing Member in respect of which the deposit was made	The cash collateral held by LCH Clearnet Group is invested following internal rules and constraints. Some of these rules and constraints are: • A minimum rating requirement for credit counterparty • Limits by type of investment and type of counterparty • Daily monitoring of the limits (cannot exceed 10% of the bank's regulated capital) • Collateralisation of the portfolio LCH Clearnet Ltd. has a policy of securing a significant portion of the cash portfolio via: • Direct Investments in quasi-government or government securities • Tri-Party arrangement of bilateral repos The remaining amount of cash that is not secured is deposited in the money markets on an unsecured short term basis in high quality banking institutions.	CME Inc. invests margin in U.S. government securities held by a broker-dealer subsidiary of a bank, reverse repurchase agreements secured with highly rated government securities, money market funds and its Interest Earning Facility (IEF) programs. Pursuant to CME Investment Policy, CME Clearing does not invest in CME securities or any securities of its clearing members. The Investment Policy is subject to annual review by relevant Risk Committee. Any gains or losses resulting from the investments belong to CME Clearing.
Stock Lending	No evidence that Eurex lends securities held as collateral on behalf of clearing members or clients	LCH SA does not engage in stock lending	No information	No information	No information

Source: Thomas Murray Data Services

TABLE 9: CHANGES IN COLLATERAL ACCEPTANCE REQUIREMENTS AS REPORTED BY CCPs – YTD MAY 2014

CCP	Date of change	Change in collateral acceptance	Assessment of change
CC&G	Jun-14	The following Government Bonds traded on the MTS trading system and issued by the following countries will be accepted as collateral: Italy, Austria, Belgium, France, Germany, The Netherlands, Spain	Positive for liquidity management purposes and reducing the opportunity cost of other eligible collateral
HKFE	Nov-13	Bank guarantees will no longer be accepted as collateral from 1 September 2014	Under the PFMI's, Bank Guarantees are not acceptable collateral. Excluding them, lowers the risk of the collateral pool held by the CCP and increases liquidity
HKSCC	Nov-13	Bank guarantees will no longer be accepted as collateral from 1 September 2014	Under the PFMI's, Bank Guarantees are not acceptable collateral. Excluding them, lowers the risk of the collateral pool held by the CCP and increases liquidity
LCH.Clearnet	Feb-14	Changes to haircuts especially in relation to Govt. issued inflation linked bonds. ILBs now have a higher haircut than non ILBs	
LCH.Clearnet	Feb-14	Acceptance of Swiss Treasury Bills and Government Bonds included on the list of non-cash collateral	Positive for liquidity management purposes and reducing the opportunity cost of other eligible collateral
LCH.Clearnet	Apr-14	LCH.Clearnet Ltd has announced that it is making changes to its collateral processes by requesting that clearing members provide at least five business days' notice of any collateral substitution above GBP 50 million or equivalent.	
LCH.Clearnet	May-13	Performance Bonds (Bank guarantees will no longer be eligible collateral for margin cover from 1 October 2013;	Positive especially since Bank guarantees could be given by clearing members of the CCP that accepting the collateral; Lowers risk of overall collateral pool held by the CCP
NASDAQ OMX	May-14	Addition of Swedish Equities to the list of eligible collateral	
NASDAQ OMX	May-14	Addition of Danish covered bonds denominated in EUR to the collateral list	
NASDAQ OMX	May-14	The list of eligible collateral extended to include green bonds issued by the International Finance Corporation (IFC)	
SEHK	Nov-13	Bank guarantees will no longer be accepted as collateral from 1 September 2014	Under the PFMI's, Bank Guarantees are not acceptable collateral. Excluding them, lowers the risk of the collateral pool held by the CCP and increases liquidity

Source: Thomas Murray Data Service

ANNEX 4 COMPENSATION OF CEOs

TABLE 10: COMPENSATION OF CEO MEAN AND MEDIAN PAY AND STOCK/BASED INCENTIVE PORTFOLIO: WHOLE SAMPLE

	(1) Fixed Pay & Benefits	(2) Variable Cash Compensation	(3)=(1)+(2) Cash Compensation	(4) Stock-based Compensation	(5)=(3)+(4) Total Compensation	INCENTIVES Compensation (Bonus+Stock- based)/Total
YEAR						
2007 (mean)	1,103,367	1,346,611	2,445,978	1,544,563	3,990,541	59.9%
2010 (mean)	1,156,808	1,096,816	2,253,224	1,696,979	3,950,203	54.3%
Difference	53,441	-245,795	-192,754	152,415	-40,338	-5.5%
2007 (median)	993,000	1,089,782	2,202,000	665,062	3,128,627	68.6%
2010 (median)	1,036,000	834,680	2,059,836	628,943	3,008,952	62.2%
Difference	43,000	-255,102	-142,164	-36,119	-119,575	-6.4%

Source: Barontini, Bozzi, Ferrarini and Ungureanu (2013)

TABLE 11: COMPENSATION OF CEO MEAN AND MEDIAN PAY AND STOCK/BASED INCENTIVE PORTFOLIO: NON-FINANCIAL FIRMS

	(1) Fixed Pay & Benefits	(2) Variable Cash Compensation	(3)=(1)+(2) Cash Compensation	(4) Stock-based Compensation	(5)=(3)+(4) Total Compensation	INCENTIVES Compensation (Bonus+Stock- based)/Total
YEAR						
2007 (mean)	1,051,262	1,207,662	2,258,925	1,625,678	3,884,603	60.8%
2010 (mean)	1,128,097	1,190,376	2,318,473	1,830,131	4,148,604	58.4%
Difference	74,834	-17,286	57,548	204,453	262,001	-2.4%
2007 (median)	962,527	1,017,599	2,024,138	711,732	3,041,358	69.0%
2010 (median)	1,030,269	920,996	2,097,355	806,206	3,117,724	65.2%
Difference	67,742	-96,604	73,217	94,474	76,565	-3.8%

Source: Barontini, Bozzi, Ferrarini and Ungureanu (2013)

TABLE 12: COMPENSATION OF CEO MEAN AND MEDIAN PAY AND STOCK/BASED INCENTIVE PORTFOLIO: FINANCIAL FIRMS

	(1) Fixed Pay & Benefits	(2) Variable Cash Compensation	(3)=(1)+(2) Cash Compensation	(4) Stock-based Compensation	(5)=(3)+(4) Total Compensation	INCENTIVES Compensation (Bonus+Stock- based)/Total
YEAR						
2007 (mean)	1,292,123	1,831,481	3,123,603	1,250,734	4,374,317	56.4%
2010 (mean)	1,266,216	757,880	2,024,096	1,214,617	3,238,713	39.5%
Difference	-25,907	-1,073,601	-1,099,508	-36,097	-1,135,605	-16.9%
2007 (median)	1,100,000	1,571,591	2,853,543	n.a.	3,544,349	65.8%
2010 (median)	1,038,962	319,000	1,963,085	n.a.	2,337,475	39.4%
Difference	-61,038	-1,252,591	-892,458	n.a.	-1,206,874	-26.5%

Source: Barontini, Bozzi, Ferrarini and Ungureanu (2013)

GLOSSARY

Asset Backed Commercial Paper (ABCP): Short-term (maturity of up to 270 days) debt backed by some financial asset, such as trade receivables, consumer debt receivables, securities, or auto and equipment loans or leases.

Asset Backed Security (ABS): A fixed income or other security that is collateralised by any type of self-liquidating financial asset that allows the holder of the security to receive payments that depend primarily on cash flows from the assets.

Bilateral Repo: Repos between two institutions where settlement typically occurs on a delivery-versus-payment basis. The transfer of the collateral to the cash lender occurs simultaneously with the transfer of the cash to the collateral provider.

Central Counterparty (CCP): A single organisation stands between trades within a market. In this respect, a CCP becomes the seller to every buyer, and the buyer to every seller.

Collateralised Bond Obligations (CBOs): An investment grade bond backed by a pool of junk bonds. Junk bonds are typically not investment grade, but because they pool several types of credit quality bonds together, they offer enough diversification to be investment grade.

Collateral Transformation: In securities lending on a non-cash collateral basis, a party usually swaps, or temporarily exchanges their lower quality assets, by posting them as collateral for higher quality assets, such as treasury securities.

Collateralised Debt Obligation (CDO): A structured financial product that pools together cash flow-generating assets and repackages this asset pool into discrete tranches that can be sold to investors.

Collateralised Loan Obligation (CLO): Securitisation vehicles backed predominantly by commercial loans.

Commercial Paper (CP): Short-term (maturity of up to 270 days), unsecured corporate debt.

Consumer Price Index (CPI): A monthly index containing monthly data on changes in the prices paid by urban consumers for a representative basket of goods and services.

Contingent Capital: An off-balance-sheet arrangement by which a company can ensure that a certain amount of funding is available when a pre-arranged trigger event, such as a natural disaster or the fulfilment of a raw materials price threshold, has been reached.

Contingent Convertible Bonds (CoCos): Bonds which are only convertible into stock if the stock price spikes quickly.

Credit Default Swap (CDS): A financial contract in which one party agrees to make a payment to the other party in the event of a specified credit event, in exchange for one or more fixed payments.

Credit risk: A risk that the counterparty is unable or unwilling to meet its obligations.

Cross-currency swap: An agreement between two parties to exchange interest payments and principal on loans denominated in two different currencies. In a cross currency swap, a loan's interest payments and principal in one currency would be exchanged for an equally valued loan and interest payments in a different currency.

Cyclically Adjusted Price-Earnings ratio (CAPE ratio): A ratio which measures the price of a company's stock relative to average earnings over the past 10 years.

Dark pool: The name given to trading volume created by institutional orders that are not pre-trade transparent or available to the public.

Derivative: A financial contract whose value derives from underlying securities prices, interest rates, foreign exchange rates, commodity prices, or market or other indices.

Enterprise Risk Management (ERM): Includes methods and processes used by organisations to manage risks and seize opportunities related to the achievement of their objectives.

Euro Interbank Offered Rate (EURIBOR): The rate at which Euro interbank term deposits are offered by one prime bank to another prime bank within the euro area.

Exchange-traded fund (ETF): A collective investment vehicle traded on an exchange. ETFs may be attractive to investors because of their low costs and tax efficiency.

Financial Market Infrastructure (FMI): A multilateral system among participating financial institutions, including the operator of the system, used for the purposes of recording, clearing, or settling payments, securities, derivatives, or other financial transactions.

Global systemically important financial institutions (G-SIFIs): G-SIFIs are financial institutions (listed by Financial Stability Board) whose distress or disorderly failure, because of their size, complexity and systemic interconnectedness, would cause significant disruption to the wider financial system and economic activity.

Government Sponsored Enterprise (GSE): A corporate entity that has a federal charter authorised by law, but that is a privately owned financial institution. Examples include the Federal National Mortgage Association (Fannie Mae) and the Federal Home Loan Mortgage Corporation (Freddie Mac) in the US.

Haircut: The discount, represented as a percentage of par or market value, at which an asset can be pledged as collateral. For example, a \$1,000,000 bond with a 5% haircut would collateralise a \$950,000 loan. The purpose of a haircut is to provide a collateral margin for a secured lender.

Interest Rate Swap: A derivative contract in which two parties swap interest rate cash flows on a periodic basis, referencing a specified notional amount for a fixed term. Typically one party will pay a predetermined fixed rate while the other party will pay a short-term variable reference rate that resets at specified intervals.

Leveraged Buyout: An acquisition of a company financed by a private equity contribution combined with borrowed funds, with debt comprising a significant portion of the purchase price.

Leveraged Loan: Loans extended to a borrower who already has significant amounts of debt or whose debt is not rated investment grade by credit rating agencies.

Loan-to-Value Ratio: The ratio of the amount of a loan to the value of the asset that the loan funds, typically expressed as a percentage. This is a key metric when considering the level of collateralisation of a mortgage.

London Interbank Offered Rate (LIBOR): The interest rate at which banks can borrow unsecured funds from other banks in London wholesale money markets, as measured by daily surveys. The published rate is a trimmed average of the rates obtained in the survey.

Money Market Mutual Fund (MMF): A type of mutual fund that invests in short-term, liquid securities such as government bills, CDs, CP, or repos.

Mortgage-Backed Security (MBS): Asset Backed Securities backed by a pool of mortgages

Municipal Bond: A bond issued by states, cities, counties, local governmental agencies, or certain nongovernment issuers to finance certain general or project-related activities.

Over-the-counter (OTC) derivative: A financial contract whose value derives from an underlying reference value, such as the price of a stock or bond, an interest rate, a foreign exchange rate, a commodity price, or an index, and that is negotiated and traded bilaterally rather than through a centralised exchange.

Payment-in-kind (PIK) bond: A bond that compensates the holder with other bonds rather than cash.

Pro-cyclicality: The tendency of changes in asset prices and capital flows to move in line with macroeconomic business and financial cycles.

Real Estate Investment Trust (REIT): An operating company that manages income-producing real estate or real estate-related assets.

Re-hypothecation: A practice by which banks and brokers use assets that have been posted as collateral by their clients for their own purposes.

Repo: A transaction that involves the sale of a security and an agreement to repurchase the security at a defined point in the future.

Residential Mortgage-Backed Security (RMBS): A security that is collateralised by a pool of residential mortgage loans and makes payments derived from the interest and principal payments on the underlying mortgage loans.

Risk Appetite Statement (RAS): A Risk Appetite Statement establishes a common understanding between executive management and the board of directors regarding desirable risks underlying the execution of the enterprise's strategy.

Rollover Risk: The risk that as an institution's debt nears maturity, the institution may not be able to refinance the existing debt or may have to refinance at less favourable terms.

Securities Lending/Borrowing: The temporary transfer of securities from one party to another for a specified fee and term, in exchange for collateral in the form of cash or securities.

Securitisation: Packaging up assets into another financial product, with this new product marketed to potential investors. An example is mortgage backed securities.

Special Purpose Vehicles (SPVs): Also referred to as a "bankruptcy-remote entity" whose operations are limited to the acquisition and financing of specific assets. The SPV is usually a subsidiary company with an asset/liability structure and legal status that makes its obligations secure even if the parent company goes bankrupt.

Subordinated bonds: A bond that ranks below other loans (or securities) with regard to claims on assets or earnings.

Sukuk bonds: An Islamic finance product that is similar to a western-style bond. The bond pays a return to investors, but is structured in such a way as to be compliant with the *Sharia* principle of not charging *riba* or interest.

Tri-Party Repo: Tri-party repo is a transaction for which post-trade processing - collateral selection, payment and settlement, custody and management during the life of the transaction - is outsourced by the parties to a third-party agent. Tri-party agents are custodian banks.

Turnover ratio (of bonds): A measure of market liquidity that shows the degree of trading in the secondary market relative to the amount of bonds outstanding. The higher the ratio, the more active the secondary market.

Value-at-Risk (VaR): A tool measuring the risk of portfolio losses. The VaR projects the probability and maximum expected loss for a specific time period.

Wealth-Management Products (WMPs): Products sold to investors as higher-yielding alternatives to time deposits, WMPs are largely off-balance sheet investment vehicles offered by banks, trusts, and securities companies.

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