

Mitigating Systemic Risk
A Role for Securities Regulators

Discussion Paper



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Executive Summary

This Discussion Paper of the Technical Committee (TC) of the International Organization of Securities Commissions (IOSCO) addresses the role that securities regulators play in promoting financial system stability. In particular, the paper provides insight and guidance on the tools that can be used by securities regulators to identify, monitor, mitigate and manage systemic risk.

Securities regulators have a key role to play in addressing systemic risk, bringing their particular perspective as market integrity regulators. To this end, IOSCO has identified reducing systemic risk as one of the three objectives of securities regulation. The recent financial crisis has led securities regulators to put greater emphasis on systemic risk and financial stability.

In July 2010, IOSCO adopted new principles of securities regulation including the need for processes to monitor, mitigate and manage systemic risk and to review the extent of regulatory coverage.¹ IOSCO also created the Working Group on Systemic Risk (Working Group) to examine the role of securities regulators with respect to systemic risk. This paper, which is the core deliverable of that working group, aims to:

- promote discussion of the ways in which systemic risk intersects with the mandate of securities regulators; and
- provide insight into how IOSCO and securities regulators should identify, monitor, mitigate and manage systemic risk.

Promoting financial stability is a shared responsibility amongst the regulatory community. Securities regulators, prudential regulators and central banks all have an important role to play and come equipped with different tools at their disposal. The nature of the risk identified will, to a large extent, dictate which set of tools will be most effective in addressing the risk.

Due to their mandate and ongoing oversight, securities regulators have a number of advantages in addressing certain aspects of specific systemic risk concerns. For example, securities regulators, through their traditional focus on transparency and disclosure are well placed to work towards an appropriate flow of information to market participants, investors and regulators.

A key message of this paper is that securities regulators are determined to develop a more robust framework of oversight and supervision that emphasizes:

- greater transparency and disclosure throughout markets, regardless of the level of regulation applied to them, and an expansion of the scope of supervision;
- an approach to financial innovation that seeks to better understand the potential risks associated with financial innovation and find the right balance between unrestrained innovation and overregulation;

¹ IOSCO Objectives and Principles of Securities Regulation, July 2010, available at <http://www.iosco.org/library/pubdocs/pdf/IOSCOPD323.pdf>.

- increased internal resources devoted to monitoring market developments and identifying emerging risks; and
- engaging with other regulators and supervisors (i.e. prudential regulators, central banks and self-regulatory organizations), both nationally and internationally, to produce a more robust and coordinated framework for promoting financial system stability.

This paper is intended to provide guidance rather than a set of requirements. Thus, a general theme running throughout is that each IOSCO member will need to determine its own response in relation to its mandate and domestic regulatory structure as well as the relative size and characteristics of its securities market. Individual regulators will consequently need to evaluate the scale of their response and the extent to which they can leverage, rather than duplicate, the work of other members of the regulatory community.

IOSCO's members have a variety of regulatory models, including integrated regulators and those that are sectorally focused. In addition, a number of countries have adopted a structure in which research and oversight of systemic risk is co-ordinated in a particular body or forum. As a result, this paper aims to identify the tools and information regulators should have access to, regardless of their source.

The Discussion Paper starts by putting into context the role of securities regulators with respect to systemic risk. There are a number of lessons that can be learned from the recent financial crisis which help to define the securities regulators' role. There have been a number of developments around the world that have been aimed at reinforcing the regulatory infrastructure and its ability to address systemic risk concerns pro-actively. Building upon that, IOSCO has an essential role to play in coordinating activity across regulators and establishing best-practices for securities regulators.

The paper then describes in Chapter 2 some of the primary ways in which systemic risk can develop in securities markets. It also stresses the importance for securities regulators of considering the channels through which the effects of a systemic crisis can be transmitted across the financial system and the real economy. Understanding both the development and transmission of risk will undoubtedly facilitate the regulators' roles in developing approaches to identify and effectively address emerging systemic risk.

In Chapter 3, the paper proposes some approaches and indicators that securities regulators may use in seeking to identify sources of systemic risk. To a large extent, securities regulators will be able to leverage work of other regulatory bodies in their efforts to identify activities in securities markets that contribute to systemic risk. It will be important however for securities regulators to identify or develop their own risk indicators through the use of both qualitative information (through general market surveillance, review of products and securities offerings and business conduct oversight) and quantitative data (micro and macro level indicators).

Lastly the paper provides guidance on how securities regulators can act, both to reduce the opportunity for systemic risk to arise and to reduce its impact. The tools securities regulators could consider using include measures to increase transparency, business conduct rules, organisational, prudential and governance requirements and emergency powers. In some cases, regulators will have to collaborate with other regulators and raise risk awareness. The

aim of these measures is to promote conditions under which market participants are better able and incentivised to manage and appropriately price risk.

The fundamental objectives of this paper are to outline a general approach that should be taken by regulators and spur further discussion on the role of securities regulators in addressing systemic risk. Recognizing that discussions on this topic will be ongoing, IOSCO will continue to facilitate the dialogue among securities regulators as well as with the broader regulatory community and other stakeholders.

The Working Group was co-chaired by the Autorité des marchés financiers of Québec and the Ontario Securities Commission.

Chapter 1 Systemic Risk within the Context of Securities Regulation

This chapter sets out the role securities regulators should play in addressing systemic risk. It discusses:

- the lessons learned from the recent financial crisis regarding systemic risk;
- the role of securities regulators with regard to systemic risk; and
- IOSCO's role in supporting financial stability, including, importantly, its principles relating to systemic risk.

A. Introduction

The crisis had a severe impact on the real economy and was a sobering event for investors and financial regulators. The crisis has thrown into question many fundamental assumptions about the existing regulatory approach.

For some securities regulators, these questions highlight the failure of a broadly shared conceptual framework for securities regulation which warrants a rethink in light of the crisis. Other securities regulators argue that these questions did not challenge the pre-crisis framework while others argue that there was no broadly shared conceptual framework before the crisis.

Despite these differences, the events of the crisis provided lessons for securities regulators and highlighted that changes are needed in the practices of securities regulators to address failings evident from those events.

A key element of this consensus is that securities regulators must understand their role and contribution in addressing systemic risk (and promoting financial stability). Securities regulators need to consider how the core functions of business conduct regulation and ensuring transparent, fair and efficient markets can support, and in turn be supported by, monitoring and mitigation of systemic risk within securities markets, and how the core tools of securities regulators can be better applied to address systemic risk concerns.

In this regard, the thinking of securities regulators is in line with other post-crisis work. Addressing risks to financial stability has been a key and unifying theme in the work of international financial institutions, governments and domestic regulators across all sectors in the three years since the crisis.

The intensity and speed with which systemic problems spread through the broader market, and the duration of those problems, highlighted the need for increasing the scope and use of traditional financial regulatory tools as well as the introduction of greater monitoring of so-called *macro-prudential* factors – that is, variables that can result in systemic risk. As a result, financial authorities are engaged in a major effort to improve their understanding of systemic risk, strengthen their ability to detect it and devise tools to mitigate it. Much of this work has been led by international institutions (such as the International Monetary Fund (IMF), the Financial Stability Board (FSB) and the Bank of International Settlements (BIS)) and central banks, as well as prudential supervisors in the context of the Basel III framework.

In April 2009, the G-20 leaders recommended that regulatory frameworks be reinforced with a macro-prudential overlay that promotes a system-wide approach to financial regulation and oversight and mitigates the build-up of systemic risk. They also called for all financial authorities to take account of financial stability and develop effective tools to address systemic risk.² The FSB was established in April 2009 as a successor of the Financial Stability Forum, with a mandate to address vulnerabilities and develop and implement regulatory, supervisory and other policies in the interest of financial stability.

Leaders reiterated their commitment towards reducing systemic risk at the June 2010 Summit in Toronto.³ The G-20 also commissioned work in various areas including the definition of systemic risk, informational gaps and the regulation and oversight of systemically important financial institutions (SIFIs).

In line with the international context and regulatory developments, this paper focuses on the practical implications for securities regulators by identifying lessons from the crisis.

B. The Traditional Approach to Securities Regulation

B.1 The IOSCO Objectives and Principles of Securities Regulation

IOSCO's Objectives and Principles of Securities Regulation (Principles)⁴, drafted in 1998 after the Asian financial crisis and revised in 2003, set out a framework for the regulation of securities markets, intermediaries in those markets, issuers of securities, and matters relating to collective investment schemes. IOSCO expects these Principles to provide securities regulators with high-level guidance for their work. They have developed into the key international regulatory standards for the securities sector.

The Principles are supported by a comprehensive Methodology⁵, which the IMF and the World Bank use to assess national securities regulation regimes via the Financial Sector Assessment Program. The Methodology is intended to be used by the FSB for its peer reviews.

The Principles positioned securities regulators as carrying the primary responsibility for maintaining and enhancing the integrity, efficiency and fairness of securities markets, and for protecting investors from improper behaviour by market insiders and others with informational advantages. The Principles also made clear that securities regulators have a fundamental role to play in maintaining confidence in the market and promoting

² *Enhancing Sound Regulation and Strengthening Transparency*, G-20, March 2009, available at http://www.g20.org/Documents/g20_wg1_010409.pdf.

³ "The recent financial volatility has strengthened our resolve to work together to complete financial repair and reform. We need to build a more resilient financial system that serves the needs of our economies, reduces moral hazard, limits the build-up of systemic risk and supports strong and stable economic growth". *The G-20 Toronto Summit Declaration*, G-20, 26-27 June 2010, available at http://www.g20.org/Documents/g20_declaration_en.pdf.

⁴ *Objectives and Principles of Securities Regulation*, June 2010, available at <http://www.iosco.org/library/pubdocs/pdf/IOSCOPD323.pdf>.

⁵ *Methodology for Assessing Implementation of the IOSCO Objectives and Principles of Securities Regulation*, February 2008, available at <http://www.iosco.org/library/pubdocs/pdf/IOSCOPD266.pdf>.

transparency.

The primary emphasis of the Principles is on comprehensive disclosure and market discipline, backed by regulatory oversight, to protect investors and enhance confidence. They also emphasised the role of business conduct regulation and corporate governance in protecting investors and addressing any misalignment in the interests of managers and investors.

The Principles recognised the importance of systemic risk and the role of securities regulators in preventing and mitigating such risks.⁶ Nonetheless, one of the lessons of the crisis is that securities regulators, among others, generally paid insufficient attention to systemic risk.

B.2 Insufficient focus on systemic risk

The pre-crisis practices of securities regulators and the Principles reflected a lack of a financial stability perspective in securities regulation. In many cases, the focus of securities regulation also reflected the architecture of financial and economic regulation.

With most monetary authorities targeting financial stability via money-market and credit-market instruments, and with financial regulators focusing squarely on the soundness of individual financial institutions and the integrity of financial markets, there was no generally recognised need for securities regulators to take a financial stability perspective. There was also limited research on the impact of financial market developments on the soundness of financial institutions and the stability of the financial system. As a result, securities regulators did not have a significant role in identifying and responding to macro-prudential issues.

Of course, this did not preclude cooperation among agencies aimed at securing financial stability. In some jurisdictions prudential regulators and monetary authorities shared information and cooperated in stress-testing the banking system. However, the focus on regulating individual institutions meant that there was limited inter-agency research and coordination regarding the distribution of risks among these entities and the correlation of risk profiles across the sectors.

C. Lessons from the Crisis for Securities Regulators

The crisis highlighted that although the traditional disclosure and business conduct oversight functions of securities regulators contribute to a reduction of systemic risk, they are not specifically designed to do so and, in their scope and application at the time of the crisis, were not sufficient to prevent systemic risk from emerging and threatening financial stability, particularly when those risks emerge in areas where disclosure and business conduct rules are inapplicable, insufficient or inadequately applied. During the crisis, a number of contributing factors that threatened financial stability were not sufficiently mitigated by the practice and/or scope of business conduct oversight and disclosure regulation prevailing at the time.

The following are examples:

⁶ One of the three overarching objectives of securities regulation stated in the preamble to the original Principles is the reduction of systemic risk, and Principle 30 was concerned with the reduction of systemic risk.

- a) The role of non-bank financial institutions (with securities regulators as the primary regulator). Some of these institutions played a similar role to banks in creating and transmitting systemic risk, but were not subject to a corresponding level of supervision;
- b) The interconnectedness of the global market place. The growing interactions between banking and capital markets and the level of interconnectedness in the system were not properly understood and monitored by regulators or market participants, and therefore risks that were magnified by interconnectedness were not appropriately priced in the market;
- c) Capital requirements and prudential standards which did not create incentives for appropriate risk taking. Market participants may have had incentives to move their activities to less regulated and more opaque segments of the system, negating the effectiveness of existing regulation;
- d) Product complexity. Complexity challenged the capacity of disclosure and market conduct regulation to overcome information asymmetries and resolve conflicts of interest: even with the disclosure available at the time, certain market participants, including professional investors and market gatekeepers, lacked an understanding of the risks inherent with complex investments;
- e) Product innovation. Notwithstanding their benefits, innovations in finance complicated institutions' risk management and increased the cost of information by increasing interconnections between markets and amplifying problems in particular markets and institutions of any size and function, resulting in transmission of risk through other parts of the financial system. Inadequate disclosure about the risks associated with new products exacerbated this problem, and a lack of understanding of risks also contributed to the lack of disclosure;
- f) Conflict management. Managing conflicts of interest, especially in financial conglomerates became more difficult and costly. Certain *gatekeepers* – in particular credit rating agencies – were not subject to sufficient (reputational) constraints and there was over-reliance on their assessments of the risks attached to institutions, products and strategies rather than internal risk assessments;
- g) The cyclical nature of financial markets, and the tendency for both regulation and market participants' behaviour to be pro-cyclical; and
- h) The risks in over-the-counter (OTC) markets. A lack of transparency and robust infrastructures in OTC markets have undermined market confidence at the height of the crisis, raising fears over counterparty strength and contributing to the rapid evaporation of liquidity, thereby exacerbating the crisis.

Securities regulation did not adequately deal with these features and consequently the following outcomes were observed:

- a) Certain activities that had significant impact on incentives, the flow of information or distribution of risks were not regulated in many jurisdictions (for instance credit ratings agencies).

- b) Inadequate attention was given to the negative externalities and systemic implications of risks accumulating as a result of individual institutions' behaviour (this goes to the need for a macro-prudential framework highlighted by international institutions and G-20 leaders);
- c) Prior to the crisis, in many jurisdictions, securities regulators were not charged with evaluating systemic risk as part of their official remit, which was typically focused on investor protection and market integrity. In some cases, there was a misunderstanding of the risks in the system and an inadequate and/or incomplete application of the traditional tools of securities regulators to limit undesirable or improperly priced risk-taking through market discipline, disclosure and corporate governance.

D. Post-crisis Responses

The work of international institutions and the regulatory community since the crisis has focused primarily on addressing risks to financial stability. This section sets out those responses and outlines the response of IOSCO and securities regulators.

D.1 Recent work at the international level

D.1.1 Defining and measuring systemic risk

In 2009, the IMF, the FSB and the BIS set out an approach to assessing systemic importance.⁷ They first proposed defining a “systemic event” as “a risk of disruption to financial services that (i) is caused by an impairment of all or parts of the financial system and (ii) has the potential to have serious negative consequences for the real economy.”

They then outlined three main criteria to assess the “systemic importance” of firms, markets or instruments. These were *size* (the volume of financial services provided by the individual component of the financial system), *substitutability* (the extent to which other components of the system can provide the same services in the event of a failure) and *interconnectedness* (linkages with other components of the system). They proposed that an assessment based on these three criteria should be complemented with reference to *financial vulnerabilities* (leverage, liquidity risk, maturity mismatches and complexity) and the capacity of the institutional framework (including market infrastructures) to deal with financial failures. These guidelines offered an early conceptual framework which has since served as a very useful reference point for supervisors and the industry alike. However, the practical implementation of those guidelines remains challenging, in particular due to the nature of our markets and instruments as well as the measurement and inclusion of criteria other than size.

These initial considerations have been augmented by various contributions offering sectoral perspectives (e.g. insurance, hedge funds, money market funds), raising specific concerns (e.g. in relation to high frequency trading or systemic aspects of the credit default swaps markets) or reflecting the industry's views (notably, the difference between systemic importance and systemic risk and the benefits of large financial institutions). Different

⁷ *Guidance to assess the Systemic Importance of Financial Institutions, Markets and Instruments: Initial Considerations and Background paper*, Report to G-20 Finance Ministers and Governors FSB, IMF, BIS, October 2009, available at <http://www.bis.org/publ/othp07.pdf>.

dimensions of systemic risk are being discussed, such as the impact of concentration, contagion mechanisms and aspects of collective behaviour (herd effects, crowded trades and market freezes), many of which are relevant to securities regulators. Alongside the potential for a shock to the financial system and its propagation, the time dimension of systemic risk emerges as an important element to consider and is connected to the work on the pro-cyclicality of financial and regulatory behaviour. Those various contributions highlight the complexity and diversity of risks to be considered.

This work is complemented by a vast effort by the IMF, the BIS, central banks, academics and others to improve the identification of systemic risk sources and develop early warnings (e.g. using stress indicators and risk maps). New methodologies are being tested to measure individual contributions to systemic risk and improve the understanding of the various contagion effects across the financial system (network approaches, co-risk and default clustering models and portfolio approaches). In connection to this work, the FSB and the IMF have published a map of information gaps in identifying sources of systemic risk (in particular regarding the collection of information on linkages between financial institutions and including information about unregulated areas of the financial system), alongside recommendations for strengthening data collection.⁸ This area clearly remains a major challenge for supervisors and the industry, in terms of coverage and types of data requested (at the macro and financial institution level) for reporting, analysing and exchanging information, and of costs involved.

D.1.2 The new prudential framework and the regulation and oversight of Systemically Important Financial Institutions

The revision of the banking prudential framework was seen as a major step preventing the accumulation of risks in the financial system. Measures include seeking to increase capital (both the quantity and quality thereof) and better calibrate specific risks such as market risks and the treatment of credit counterparty risk. Other changes aim to address risks related to size, leverage or interconnectedness and to reduce pro-cyclicality and the build-up of systemic risk (e.g. the proposals for countercyclical capital buffers). The new framework also provides for the regulation of products and institutions that have been recognised as having the potential to pose systemic risk. For example, the new framework provides incentives to clear OTC derivatives through central counterparties (CCPs); these incentives will support the important structural trend initiated since the crisis to reduce risks through central clearing (cf. also CPSS-IOSCO's current work on the revision of standards for CCPs)⁹.

The FSB is conducting additional work to address the risks of SIFIs, aimed at ensuring greater loss absorbency by various means. A key challenge is to define those systemic institutions and how to manage associated moral hazard issues. Partly to reduce the moral hazard posed by SIFIs, supervisors and regulators around the world are working to strengthen supervisory cooperation and improve crisis management and resolution tools, notably at the international level.

⁸ *The Financial Crisis and Information Gaps*, FSB/IMF, October 2009, available at http://www.financialstabilityboard.org/publications/r_091107e.pdf. See also *Systemic Risk Information Study*, SIFMA, June 2010, available at http://www.sifma.org/regulatory/pdf/SIFMA_Systemic_Risk_Information_Study_June_2010.pdf.

⁹ Press Release *CPSS - IOSCO review of standards for payment, clearing and settlement systems 2* February 2010, available at <http://www.iosco.org/news/pdf/IOSCONEWS177.pdf>.

D.1.3 Institutional arrangements to support effective macro-prudential oversight

Specific new institutional arrangements have been approved to strengthen system-wide oversight and help meet some of the challenges identified during the financial crisis. Examples include the establishment of the Financial Stability Oversight Council (FSOC) in the United States of America and the setting up of the European Systemic Risk Board (ESRB). They will be in charge of identifying systemic risk, preventing regulatory loopholes and the emergence of risks outside the regulated sector, and making recommendations. Both the FSOC and the ESRB will have devoted resources and access to significant research efforts. Several countries have also established systemic risk committees, such as the United Kingdom, France, Germany, Spain, Hong Kong and Brazil and we expect others to follow. Securities regulators are members of those bodies.¹⁰

The aim of both existing and new institutional frameworks is to help coordinate micro-prudential and macro-prudential approaches and facilitate cooperation among supervisors. Data collection efforts being undertaken will feed the work of these various systemic risk bodies, which will also have to consider international linkages as well as cross-border activities and markets.

Securities regulators' participation in the discussions has so far been limited, partly because the risks relating to markets as opposed to institutions are perhaps more diffuse and difficult to tackle, and partly because securities regulators have not been at the forefront of considering financial stability issues. However, many of the reforms pursued by securities regulators since the financial crisis contribute to financial stability by targeting specific vulnerabilities and potential sources of systemic risk. They mark a significant sharpening of focus of the securities regulators, and of IOSCO, on systemic risk.

D.2 A Revised Approach to Securities Regulation

D.2.1 Revised IOSCO Principles

After the financial crisis, IOSCO revised the Principles to provide guidance on how issues highlighted by the crisis should be addressed. The revisions included eight new Principles as well as several revisions to existing Principles, and these have been noted by the FSB and the G-20.

¹⁰ For instance at the European level, ESMA (the newly-established European Securities Markets Authority) is a contributor to the ESRB general oversight, alongside domestic regulators. In the United States, market regulators such as the CFTC and the SEC contribute to the assessment of risk by the FSOC, along with prudential regulators and the US Treasury. In Brazil, the Ministry of Finance formed in 2006 a committee (the "Supervisory and Regulatory Committee of Financial Systems, Capital Markets, Private Insurance and Social Welfare" or "COREMEC") to coordinate and to improve the performance of the federal agencies that govern and control the activities related to the financial system. The COREMEC created recently a Steering Committee that should report the developments of market participants that pose risks to the financial system and indicate the needs of a joint and coordinated action of the four regulators in order to assure the financial stability. Some other jurisdictions already had formal or informal institutional arrangements in place that allowed the regulators, central banks and policy makers to monitor risks across two or more sectors in the financial system. For example, Australia's Council of Financial Regulators performed this role prior to and during the crisis, and continues to do so.

In particular, IOSCO adopted two new principles on identifying, assessing and mitigating systemic risk (Principle 6), and on reviewing the regulatory perimeter (Principle 7), and is currently in the process of developing an appropriate methodology to support these new principles. The preparation of this Discussion Paper is intended to contribute to that work. These principles are among eight relating to the conduct of securities regulators, and both relate to the third objective of securities regulation, which is to reduce systemic risk.¹¹ In addition, IOSCO also decided to incorporate identification and mitigation of systemic risk in the organisation's strategic mission and goals for the next five years.

Principle 6 and the associated commentary approved by IOSCO are as follows:

The Regulator should have or contribute to a process to monitor, mitigate and manage systemic risk, appropriate to its mandate.

Systemic risk refers to the potential of any widespread adverse effect on the financial system and thereby on the wider economy. Factors which can give rise to systemic risk may include the design, distribution or behaviour under stressed conditions of certain investment products; the activities or failure of a regulated entity; a market disruption; or an impairment of a market's integrity. Systemic risk can also take the form of a more gradual erosion of market trust caused by inadequate investor protection standards, lax enforcement, insufficient disclosure requirements, inadequate resolution regimes or other factors.

The regulator should have or contribute to regulatory processes, which may be cross-sectoral, to monitor, mitigate and appropriately manage such risk. The process can vary with the complexity of the market. Regulators should have particular regard to investor protection, market integrity, and the proper conduct of business within markets as contributing factors to reducing systemic risk.

Principle 7 and the associated commentary approved by IOSCO are as follows:

The Regulator should have or contribute to a process to review the perimeter of regulation regularly.

The Regulator should adopt or participate in a process for conducting a rigorous and regular review of markets and market participants' activities so as to identify and assess possible risks to investor protection, market fairness, efficiency, and transparency or risks to the financial system and review the existing perimeter of regulation in order to mitigate risks to these regulatory Objectives. Such review should include consideration of whether new developments in financial products have an effect on the scope of securities regulation, and whether the regulatory premises underlying any existing regulatory exemptions (such as those dealing with sophisticated or institutional investors) continue to be valid. Regulators should have in place a process for both periodically and on an ad hoc basis determining whether the regulators' existing powers, operational structure, and regulations are sufficient to meet potential emerging risks.

Such a process should allow for any necessary changes to the existing perimeter of regulation, which may also include seeking legislative amendment, to be made effectively and in a timely way in response to an identified emerging risk.

¹¹ Supra footnote 4.

D.2.2 IOSCO's role in monitoring and mitigating systemic risk

In addition to the application of the new Principles concerning systemic risk, IOSCO can support the development of a systemic risk perspective in securities regulation through other activities. The initiatives and proposed activities draw on IOSCO's strengths in developing international standards and regulatory responses to issues in securities regulation and promoting cooperation.

IOSCO's policy and guidance-setting activities allow IOSCO to lead responses to emerging regulatory issues – including those that may increase systemic risk. Examples are the Task Forces and Standing Committees that addressed issues arising from of the financial crisis (see Figure D at the end of the paper).

IOSCO is undertaking close collaboration and consultation with industry participants and senior supervisors for purposes of intelligence gathering and discussions about systemic risk. Importantly, IOSCO is also building its research capability to provide cross-jurisdictional analyses of securities markets.

These activities can all strengthen IOSCO's ability to influence international debate on emerging risks and mitigation tools. These opportunities and examples of IOSCO work are discussed in Chapter 4 Section B of this paper.

D.2.3 Issues for Securities Regulators

Securities regulators have begun to focus on systemic risk in line with revisions to the Principles, and the activities outlined above. They recognise that the pre-crisis practices that emphasised market discipline and transparency remain essential but need to be strengthened and complemented by stability focus on the challenges presented by systemic risk.

This focus will require changes in the approach to securities regulation and will require enhanced access to information for regulators (e.g. through trade repositories) and better surveillance systems that are able to cope with the greater integration of markets and technological developments. It will also require a significant increase in supervisory resources and enhancements in securities regulators' capabilities for risk analysis. The resulting increase in costs for market participants and regulators will need to be balanced with the benefits of more intensive oversight. Lastly, it will also require regulators together with the responsible body (in some jurisdictions, the central bank or the systemic risk oversight body) to mitigate any emerging systemic risk before they can crystallise and threaten the financial system, as well as to reduce the impacts of any risks which, for whatever reason, happen to materialize.

All such actions are consistent with and support securities regulators' current mandates regarding market efficiency and integrity, corporate governance and investor protection.

The new direction implies not only monitoring the emergence of potential risks in the system, but also ensuring that financial markets are working efficiently and contributing positively to the real economy (financing, hedging and transfer of risks, price formation, and access to liquidity and efficient allocation of savings).

This Discussion Paper will highlight the issues securities regulators should consider in addressing systemic risk. Chapter 2 outlines the sources of systemic risk. Chapter 3 sets out how systemic risk can be identified while Chapter 4 discusses the measures securities regulators can take to address systemic risk.

Chapter 2 Sources and Transmission of Systemic Risks

This chapter describes the sources of systemic risk, how systemic risk develops, how it is transmitted through the securities markets and the implications for securities regulators. It is intended to provide the theoretical basis for the discussions in Chapters 3 and 4 relating to the identification and mitigation of systemic risk. Figure A describes the experiences of emerging markets during the financial crisis.

A. Sources of Systemic Risk in the Securities Markets

A number of sources of systemic risk have been identified by regulators and academic researchers. In this paper we have focused on sources which fall within the jurisdiction of securities regulators. The sources discussed below may serve as determining factors when assessing whether a particular market element (i.e. a market participant, market, market infrastructure or market activity) poses potential systemic risk. Systemic risk can build up because of a single factor, but may very well develop through a combination of the factors listed below.

It is commonly accepted that size, interconnectedness and substitutability constitute the core factors to consider when assessing the potential for systemic risk¹². In addition, there are a number of other factors that can contribute to systemic risk but in isolation do not pose a concern. The discussion below describes the factors in more detail. However, the list of factors is not exhaustive.

A.1 Size

Size is often considered the most important factor when assessing the potential for systemic risk. Conceptually, the larger the market element being considered, the more damage its failure can potentially cause to the market. Although systemic risk has traditionally been considered in relation to the banking sector, the growth of the non-bank sector has highlighted that the size of financial institutions rather than bank status has become more systemically important.¹³

Size has mostly been used to identify banks deemed “too-big-to-fail”, but is also relevant when considering a combination of many small firms¹⁴. In that case, significant size may be reached if, for instance, such firms have adopted similar investment strategies. Size is also relevant when analyzing financial activities or practices, exposures to other market participants, individual transactions and trading volumes. In addition, the use of leverage allows smaller market participants to have a disproportionate impact on the market and increases their potential to pose systemic risk (see below for more discussion under Leverage).

¹² FSB, IMF & BIS, *supra* note 7 at 11.

¹³ Schwarcz, Steven L. *Systemic Risk*, Duke Law School Legal Studies Paper No. 163; Georgetown Law Journal, Vol. 97, 2008, 193-250, available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1008326.

¹⁴ An example of systemic implications is the U.S. savings and loan crisis of the 1980s in which about 750 “thrifts” became insolvent, requiring a government bailout of \$160 billion, or an average of about \$213 million per institution. See for example, Nouriel Roubini and Stephen Mihm, *Crisis Economics: A Crash Course in the Future of Finance*.

Size may be a determining factor when considering markets as well. Once they attain a certain volume, markets in of themselves can pose risks, since they often serve as important pools of liquidity.

Size will also matter when considering investment products, particularly those with a high degree of complexity, a lack of transparency and/or an undesirable selling practice.

Using absolute size as the only proxy for systemic importance may however leave some sources of systemic risk undetected. “Legislative proposals that rely on a size-based identification process would erroneously identify a number of financial firms as systemically risky, when in fact they are not. Other firms that do in fact pose significant systemic risk would fail to be identified.”¹⁵

While size is an important consideration when assessing systemic risk, it should not be considered in isolation from other variables. In terms of entities, activities or markets, size alone does not necessarily imply systemic risk.

A.2 Interconnectedness

The interconnectedness of institutions or markets has been identified as a key consideration in assessing systemic risk. Regulators must therefore not only look at firms at the institutional level, but also from an industry perspective. Linkages or interconnections have increased due to a number of factors, such as globalization (including the growth of global financial institutions), financial innovations (such as derivatives, securitization and wholesale funding), business strategies, technology and product characteristics. In addition, communication technologies have accelerated the speed with which information travels between institutions and markets and therefore the speed with which the effect of interconnections are felt.¹⁶

These developments have led to the introduction of the concept of “too interconnected to fail”¹⁷ and to the development of different approaches to assess these linkages, which can be highly complex and challenging to analyse.¹⁸ Hence, a firm that may not appear large enough to reach systemic importance, but that is highly connected to others could become systemically important. The potential for systemic risk can be heightened if the participants are interconnected and one is dependent on the other. Greater transparency about interconnections can help regulators and market participants to understand how systemic risk may spread. This can facilitate preventative steps to address the spread of adverse effects.

¹⁵ Laursen, Christopher; Sharon, Brown-Hruska; Mackay, Robert, Bovenzi, John, *Why ‘Too Big to Fail’ is Too Short-Sighted to Succeed: Problems with Reliance on Firm Size for Systemic Risk Determination*. New York: NERA Economic Consulting, 2010, available at http://www.nera.com/67_5566.htm.

¹⁶ Schwarcz, Steven L. and Anabtawi, Iman, *Regulating Systemic Risk*. UCLA School of Law, Law-Econ Research Paper No. 10-11, 2010, available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1670017.

¹⁷ For example in the private securitization, derivatives and triparty repo market - *United States – Selected Issues*, International Monetary Fund, 2009, available at <http://www.imf.org/external/pubs/ft/scr/2009/cr09229.pdf>.

¹⁸ See *Global Financial Stability Report*, IMF, April 2009: including the network approach and the co-risk model, available at <http://www.imf.org/external/pubs/ft/gfsr/2009/01/pdf/text.pdf>.

Interconnectedness can be found between banks, but also between other market participants (e.g. insurers, broker/dealers, custodians, and hedge funds), clearing and settlement systems or markets. When acting or making decisions, market participants typically do not take into account the broader impact on others (referred to as externalities). These spillover effects can potentially increase the fragility of the financial system.¹⁹ For example, when setting its capital levels, a market participant will not take into account the contribution it makes to reducing the likelihood of cascading bankruptcies and financial market instability.

The connections between market participants result not only from direct effects such as credit or counterparty exposure but also through indirect effects or information channels which are more difficult to identify and predict.

A.3 Lack of Substitutes and Concentration

Concentration risk can arise when only one or a few market participants provide a product or activity. The potential impact is heightened when there are no effective or potential substitutes. For example, market infrastructure entities that provide key services, such as clearing and settlement systems, typically lack substitutes and therefore necessarily carry concentration risk.

Similarly, markets can also harbor concentration risk when they serve as the preferred platform for trading or raising funds. The risk is exacerbated if such markets provide vital funding liquidity to the financial system, serve as the sole avenue of hedging significant risks or provide an important price discovery function. For example, the repo market became a core short-term funding source widely used by many market participants.²⁰ Therefore, impairment of this important market would have serious negative consequences on its users.

In addition, concentration risk can be found when a small number of market participants control the trading in a particular market. This concentration of liquidity makes the market dependent on the continued support of the participants. For example, Lehman Brothers was a significant provider of liquidity in the CDS market. Lehman Brother's failure caused considerable uncertainty regarding the exposure of other participants and the impact on their balance sheets. A major effort by market participants was required to net out their respective exposure to Lehman and rebalance their books through the replacement of trades.²¹

The elimination of some players following a crisis and the on-going market pressures for consolidation in the financial sector can lead to a decrease in the number of institutions and, as a consequence, the concentration of a significant percentage of activity in the hands of a few.

The concentration of particular risks in the hands of one or a few market participants, who may not be able to manage or offset these risks, can also be the source of a systemic event.

¹⁹ Schwarcz and Anabtawi, *supra* note 13.

²⁰ Fontaine, Jean-Sébastien, Jack Selody and Carolyn Wilkins. *Improving the Resilience of Core Funding Markets*. Bank of Canada Financial System Review, December 2009, available at http://bankofcanada.ca/en/fsr/2009/fsr_1209.pdf.

²¹ *Three Market Implications of the Lehman Bankruptcy*, p. 6-7 BIS Quarterly Review, December 2008, available at http://www.bis.org/publ/qtrpdf/r_qt0812x.htm.

While AIG presented a unique situation that may not be representative, it is an interesting example given the company's role as a significant provider of credit default protection on U.S. residential mortgage backed securities. When it became widely known that AIG was experiencing financial difficulties and had written a substantial amount of CDS contracts, confidence in counterparty performance significantly declined. This left many participants unwilling to transact causing liquidity in that market to dry up.

Individual market participants can house concentration risks through the positions taken and exposures to counterparties or markets. The risks to the system will be compounded if the participant's size is large.

A.4 Lack of Transparency

Market participants need complete and accurate information about markets or products to assess the potential return and exposure to risk. A lack of transparency about product characteristics or market conditions can cause, for example, uncertainty about asset prices.

As the assessment of value is directly related to the risk associated with a product, market participants require transparency. A lack of transparency regarding a product can result in the inability to properly evaluate the risks and create sub-optimal price assessment. The under-appreciation and, therefore, mispricing of risk can, in turn, lead to the creation of an asset bubble or the widespread distribution of complex assets to participants less able to appreciate their risk.

The combination of lack of transparency and product complexity is of great concern to securities regulators. Complexity "creates an inherent information asymmetry between the originator of a financial instrument and the investors who purchase it".²² Simply providing more information is not the same thing as providing transparency²³. The difficulty in understanding the underlying assets of structured investments (such as a CDO-squared) creates a lack of transparency that makes it even harder to mark-to-market.

Market transparency contributes to an effective price formation process and can promote liquidity. Exchange-traded securities and derivatives provide transparency in terms of standardized products, price discovery and publicizing trades, while OTC securities and derivatives markets are more opaque. Lack of transparency negatively affects the ability of market participants to properly price positions and value the associated risk. It also affects the ability of regulators to identify the build-up of risk in the system. The Technical Committee's Task Force on Commodity Futures Markets (Commodity Task Force) has noted that information regarding the positions of large traders can assist regulators in this regard.

The lack of transparency is not only a matter of concern for market participants but also for regulators. Regulators require a deep knowledge of the matters they oversee in order to create a regulatory environment that fosters efficient capital markets while protecting the investors. Knowledge gaps are more likely to result in regulatory inaction or cause regulation

²² Schwarcz and Anabtawi, *supra*, note 13.

²³ "But an investor in a CDO-squared would need to read in excess of 1 billion pages to understand fully the ingredients", *Rethinking the financial network*, speech by Andrew G. Haldane, Executive Director, Financial Stability of the Bank of England, p. 17, April 2009, available at <http://www.bankofengland.co.uk/publications/speeches/2009/speech386.pdf>.

based on imprecise assumptions.

Transparency is crucial but is not always in and of itself sufficient to limit the development of risks. For example, transparency alone will not ensure that incentives are appropriately aligned. From the regulators' perspective, access to information is not enough. Regulators must also use that information and act, as necessary.

A.5 Leverage

Leverage is a key source of systemic risk as it serves as an amplifier. A non-systemic risk can become systemic through the simple effect of leverage. Leveraging can occur directly using borrowed funds or indirectly via derivatives or other products that have embedded leverage. Embedded leverage also intensifies pro-cyclicality in the financial system.²⁴

In the context of a lending transaction, there must be a participant willing to take on leverage risk and another willing to lend the funds. Leverage can also be achieved through financial market transactions (e.g. derivatives contracts) which require a counterparty to take the other side of the trade. The increased risk taken by the market participant in a leveraged position creates risk for the lender or counterparty, although those counterparty risks can be lessened in a number of ways, including through the posting of collateral. Furthermore, to assess the leverage of an institution, one needs to take into account both sides of the balance sheet. Overall leverage should be determined by considering not only the liabilities but also the leverage embedded in assets (for example, leverage within structured products).

As mentioned earlier, leverage can make a smaller firm, or a collection of small firms, a significant player in an asset class and a potential systemic risk.

The excessive leverage that had been taken on prior to the global financial crisis has led market participants to deleverage balance sheets and investment portfolios. That deleveraging furthered the downward price spirals experienced in the global financial crisis as many participants simultaneously sold assets.

A.6 Market Participant Behaviour

The behaviour of participants can result in mispricing of assets and an accumulation of risk in the financial system. For example, participants can be influenced by macroeconomic factors, such as a prolonged period of low nominal interest rates and unusually low risk premiums. This can eventually lead to excessive leverage and risk taking.²⁵ "During extended periods of prosperity, market participants become complacent about the risk of loss – either through systematic under-estimation of those risks because of recent history, or a decline in their risk aversion due to increasing wealth or both."²⁶

²⁴ *Redesigning the Contours of the Future Financial System*, Kodres, Laura and Aditya Narain, International Monetary Fund Staff Position Note, August 2010, available at <http://www.imf.org/external/pubs/ft/spn/2010/spn1010.pdf>.

²⁵ See *Global Financial Stability Report*, Chapter 2, International Monetary Fund, April 2010, available at <http://www.imf.org/external/pubs/ft/gfsr/2010/01/index.htm>.

²⁶ *Systemic Risk, and the Financial Crisis of 2007-2008: Written Testimony for the House Oversight Committee Hearing on Hedge Funds*, Lo, Andrew W., Hedge Funds, 2008, available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1301217.

Herding happens when individuals or firms simultaneously act in a similar manner. Herding can come from many different sources²⁷ and can be associated first with the build-up of asset bubbles and later with irrational panic causing a market gridlock or a rapid decline of prices in one or multiple markets (for example, because of a decrease in risk appetite).²⁸ Today's environment of increasingly rapid communications can also contribute to the development of herding behaviour. In jurisdictions or markets without a system to collect information on trading activity and/or positions, it can be challenging to identify herding.

A.7 Information Asymmetry and Moral Hazard

As the efficient functioning of financial markets is heavily dependent on the flow of information, such markets are unavoidably affected by information asymmetry issues. Participants can be challenged in their ability to assess the quality of financial products and intermediary advice. Participants also face challenges in their ability to evaluate the soundness of those with whom they transact (e.g. evaluating counterparty risk).

The interests of investors and their intermediaries may become misaligned as a result of the intermediaries' compensation structure or focus on short-term profits. Misaligned incentives can encourage intermediaries to take advantage of information asymmetries and put their interests ahead of their clients'. This can result in mispriced risk or inappropriate product selection which, if widespread, can become a source of systemic risk.

Information asymmetry can also give rise to moral hazard issues. These can occur when market participants have differing levels of information and one participant is insulated, in some way, from the consequences of its actions. Concerns can arise when participants are not accountable for their actions which can lead them to change their behaviour by taking on higher levels of risk. For example, intermediaries may fail to undertake proper due diligence if the consequences of doing so are not significant.

Moral hazard can also distort incentives for financial institutions. Large institutions with implicit or explicit government guarantees (e.g. those that are "too-big-to-fail") benefit from a lower cost of capital. Those that lend to such institutions assume there is very low probability of not getting their money back and so demand a lower return than would otherwise be the case. This discounted cost of capital allows financial institutions to borrow too cheaply and encourages them to take on higher levels of risk.

The concepts of moral hazard and information asymmetry have been used to explain some of the shortcomings of the securitization market,²⁹ credit ratings,³⁰ and intermediary distribution practices.

²⁷ For example using the same risk model, following the same indices or similar investment strategies, using the same trading algorithm or trading strategies as well as momentum investing.

²⁸ Risk appetite, a component of global market conditions, could affect the probability of a systemic episode. See IMF, Global Financial Stability Report, Chapter 3, 2009, *supra* note 18.

²⁹ Adverse selection in the loan origination process and the role of rating agencies as providers of credit ratings and providers of advice regarding product structures.

³⁰ For example, the issuer-pay model results in the potential for conflicts of interest.

B. Development and Transmission of Systemic Risk

While risk can build up in different parts of the system and in different forms, for systemic risk to crystallize there needs to be a triggering event which results in the spread of negative consequences across entities and markets and eventually to the real economy. In reality, the catalyst is usually a chain or combination of events. This section describes the types of events that can lead to a systemic crisis and the channels through which risk can spread.

Trigger events may be sudden and unpredictable. It is therefore important for securities regulators to focus on the sources of systemic risk and how that risk is transmitted. In this way, it may be possible to limit the impact of an event. Even though trigger events are difficult to predict, understanding the form an event can take may prevent its occurrence or limit the impact.

B.1 Trigger Events

The trigger for a systemic event can be widespread, affecting multiple participants or components of the financial system all at the same time. It is also possible that the trigger can be a micro-level event affecting one or more participants or components that results in a chain-like reaction. The trigger can also take the form of a combination of both macro and micro events.

Trigger events can be significant in and of themselves (e.g. stock market crashes) or can seem relatively minor (e.g. concern about the solvency of a market participant) but have snowball-like effects. As a result of the triggering event, market participants re-evaluate their exposure to risk and make corresponding adjustments to portfolio holding and business operations.

B.1.1 Macro Events

When people think of a systemic event, they most often think of a shock that affects all or most of the financial system at the same time. This kind of macro shock is generally a single event that affects multiple parts of the system contemporaneously. Shared exposure across participants can lead to near simultaneous losses that may then threaten the solvency of multiple market participants.

Exogenous macro events (i.e. those originating outside of the financial system) can take many forms. This type of event may be more commonly associated with a currency crisis, such as the currency crises in Russia and Brazil in 1998. However, other macro-economic type issues such as the OPEC oil crises, a slump in residential house prices or even a significant crop failure can also affect a large number of market participants at the same time. These types of events can link back to securities markets in numerous ways such as direct holdings or derivatives.

Events originating in securities markets can also be a systemic risk concern. For example, a collapse in market valuations or the seizure of a market can lead to widespread and simultaneous impacts on those that participate in those markets.

B.1.2 Micro Events

Systemic risk can also be a concern even if the trigger event starts with a limited number of

firms or markets. Through direct and indirect interconnections, such an event can spread to other parts of the securities markets and ultimately to the real economy. For example, the failure of one institution can directly affect another starting a chain reaction across one or more institutions and markets. This can ultimately have material adverse effects on the securities markets and broader economic activity.

B.2 Risk Transmission

Another key element of systemic risk is the channel through which the negative consequences of a triggering event can be transmitted between multiple firms and/or markets. If the transmission is broad enough, the event can threaten financial stability and real economic activity. This was seen in the financial crisis, with securitization transmitting failure in mortgage underwriting practices to financial markets.

Financial markets exist, in part, to transfer risk from one participant to another. As such, the effects of changes in market conditions are transmitted naturally as part of the markets' adjustment to new information and that transmission is essential to its efficient functioning. However, in times of stress, these channels can also lead to the spread of systemic risk.

Risk can propagate from one firm or market to another and from the greater financial system to the broader economy through two primary channels. The first is direct financial exposure between entities. Losses or, at the extreme, insolvency, at one firm have a direct impact on those with whom the firm has financial obligations.

The second manner of transmission is through information effects. Securities markets rely heavily on information and are susceptible to changes in perceived levels of risk. This channel of risk transmission can be just as devastating as direct financial exposure but can be more challenging for regulators to understand and address.

We have identified five primary ways by which risk can be transmitted through financial or information channels or a combination of both.

B.2.1 Counterparty Exposure

The financial system is often described as a network of interconnected balance sheets. Similarly, securities markets are networks of interconnected trading books and portfolios. Market participants are often linked by trading relationships between one another (e.g. derivative contracts) or membership in central counterparties.

Market intermediaries often trade between one another, with inter-dealer markets being as important to securities markets as inter-bank lending is to the banking sector. These interconnections create a counterparty or credit risk channel for the transmission of risk.

B.2.2 Changes in Liquidity

Liquidity is, in effect, the lifeblood of the financial system. It allows participants to enter or exit positions efficiently without undue impact on the price of a security. Liquid markets can also be an important source of funding and capital for market participants. The rapid evaporation of liquidity can affect the ability of a firm to meet its financial obligations and can be a channel through which the negative effects of a trigger event can spread across

securities markets and throughout the financial system.

In recent years, securities markets have grown in importance as a source of funding for firms.³¹ This trend has meant that firms are susceptible to changes in liquidity conditions. Reduced liquidity in certain markets can be a particular concern for firms that rely on short-term liabilities to fund longer-term assets. During the financial crisis, this was a particular concern for commercial paper markets, including asset-backed commercial paper.

For example, Lehman Brothers was a large issuer of commercial paper. When it declared bankruptcy, its paper, which was widely held by money-market funds, became effectively worthless. This caused significant losses for money-market funds, most notably for the Reserve Primary Fund. Growing concern about the solvency of commercial paper issuers lead market participants to reduce their risk exposure by withdrawing from the market. As a result, the amount of financial commercial paper outstanding fell 30% in the six weeks following Lehman's bankruptcy.³²

An increase in uncertainty regarding market conditions can quickly lead to the withdrawal of participants from a market. For example, a lack of transparency regarding the financial exposure or solvency of potential counterparties may cause liquidity to dry up, as participants decide to reduce their participation in and exposure to the market. In addition, large price declines could cause a further deterioration of available liquidity as participants may be less willing to transact in a falling market.

Reduced liquidity can result in *fire-sale* type scenarios for those forced to exit a position in an illiquid market. It can also cause firms to have to sell other assets in other markets. This can then cause the illiquidity in one market to impact asset values in another.³³

On May 6, 2010, U.S. securities markets experienced a short period of extreme market volatility (the so-called *flash crash*), with the prices of a number of securities falling dramatically in a matter of minutes. The extreme movement in prices left many participants with uncertainty as to the true market conditions. The result was that many market participants withdrew from the market causing a reduction in market liquidity. Once the market stabilized, they were able to assess true market conditions and resumed trading activities, causing prices to recover within a short period of time.³⁴

³¹ *Global Financial Stability Report*, Chapter 2, International Monetary Fund, October 2010, supra note 18.

³² *When Safe Proved Risky: Commercial Paper during the Financial Crisis of 2007-2009*, Kacperczyk, Marcian and Philipp Schnabl, *Journal of Economic Perspectives*, Winter 2010, available at http://pages.stern.nyu.edu/~sternfin/pschnabl/kacperczyk_schnabl_nov09.pdf.

³³ *Market Liquidity and Funding Liquidity*, Brunnermeier, Markus K. and Pedersen, Lasse Heje, *Review of Financial Studies* 22 (6), 2201-2238, June 2009, available at <http://www.princeton.edu/~markus/research/papers/liquidity.pdf>.

³⁴ SEC-CFTC Joint Report Regarding the Market Events of May 6th, published 1 October 2010. See <http://www.cftc.gov/ucm/groups/public/@otherif/documents/ifdocs/staff-findings050610.pdf>.

B.2.3 Feedback Loops

A process is said to be “tightly coupled”³⁵ if it moves from one stage to another with little opportunity for intervention. In financial markets, this can occur when trades are based on price changes, which then cause a further change in an asset’s price. In this way, the change in asset prices becomes self-feeding. For example, ratings downgrades, especially those to below investment grade, can force investors to liquidate positions, placing downward pressure on asset prices.

Tight coupling can occur when automated processes are used in trading. Trading algorithms can create feedback loops when they respond to changes in the price of a security that were initiated by the algorithm or another trader.

Risk can also be transmitted in this manner when there are contractual requirements to respond to price changes (e.g. debt covenants). For example, if a firm with a highly leveraged position experiences a decline in the value of that position, it may face collateral calls that require the sale of assets. Those sales further depress prices and collateral levels, leading to further asset sales. The firm may find itself having to sell portfolio holdings it wants to retain rather than those it wants to sell. This can then depress the price of the second security and potentially lead to a downward spiral across assets affecting a large number of investors. Through this kind of process, stable markets can be impacted by the price declines and instability in other markets.

B.2.4 Correlation

Correlation is the tendency of the prices of different assets to move together or be similarly affected by an event or the release of new information. Correlated assets can transmit risk from one part of the system to another through changes in asset prices.

When investors have similar portfolio holdings or employ similar strategies, sharp changes in the price of a particular asset can lead multiple market participants to make similar portfolio decisions. Individually, these decisions by themselves would not pose a systemic risk. However, when considered collectively, these potentially rational decisions can have a significant impact on asset prices and market liquidity.

The correlation between different assets prices and its potentially amplifying effect can lead to systemic risk concerns if it is not fully understood by market participants or if it changes over time. Changes in correlation can be dramatic during times of financial stress. When correlations change, market participants become less able to predict how the price of one asset may respond to other changes.

Investment and risk management strategies can be based on the correlation between assets. Participants may, therefore, experience significant losses when the assumed correlations change. For example, investors may have purchased U.S. residential mortgage backed securities assuming that if the mortgages were diversified in terms of geography, then the default risks would be uncorrelated. However, significant and widespread declines in house

³⁵ The tight coupling concept was first referred to by Richard Bookstaber in his article *The Myth of Non-Correlation* in the September 2007 issue of Institutional Investor, also available at <http://rick.bookstaber.com/2007/09/myth-of-noncorrelation.html>.

prices created a situation in which the defaults turned out to be highly correlated.

B.2.5 Loss of Confidence

While it is more common to think of risk being propagated through direct financial links between participants, systemic risk can also be propagated through information effects that do not involve obvious interconnections and direct causal links.³⁶

Losses in one firm or market can cause uncertainty about other firms or markets. Such heightened concern results in changes to the behaviour of other market participants. They will seek to reduce their own risk by avoiding certain counterparties, markets or products. The perceived riskiness of one market or participant spills over to others causing a broader impact. Market based systemic events are often associated with a large number of participants deciding to reduce risk taking.³⁷ A lack of information and the inability to distinguish risky from stable counterparties, markets or products can cause a loss of confidence in one or more parts of the securities market.

C. Systemic Risks and Securities Regulators' Oversight

It must be recognized that securities regulators have traditionally not exercised oversight over, nor regulated, all types of activities conducted within the securities market. For example, credit rating agencies, which have been an integral part of securities markets for many years, have only recently been subjected to regulation in some jurisdictions.

Yet, securities regulators may be confronted with systemic risk originating both within and outside the securities market. Securities regulators must also be mindful of regulatory gaps that either exist or develop over time. In addition, regulators need to be increasingly sensitive to the unintended impact that regulatory measures could have on the build-up of systemic risk.

C.1 Internal risks

Within the jurisdiction of securities regulators, a regulatory gap could arise from unanticipated developments regarding:

- i. activities that are currently regulated or, based on an assessment of their potential risk, are regulated more lightly;
- ii. activities in the exempt market, over which regulators or public authorities have initially determined that less direct oversight is warranted for the protection of investors; or
- iii. new activities that regulators have yet to address.

³⁶ *Banking and currency crises and systemic risk: Lessons from recent events*, Kaufman, George G. Federal Reserve Bank of Chicago, Economic Perspectives, 24, August 2000, available at <http://www.highbeam.com/doc/1G1-65379501.html>.

³⁷ *New Directions for Understanding Systemic Risk A Report on a Conference Cosponsored by the Federal Reserve Bank of New York and the National Academy of Sciences*, Economic Policy Review, Federal Reserve Bank of New York, Nov 2007, available at <http://www.ny.frb.org/research/epr/2007n1.html>.

In some cases, lighter regulatory treatment may be appropriate for activities and entities that are determined to be of limited risk in the context of the securities regulators' mandate. Such a determination is made by balancing the regulatory burden and the benefit to investor protection and market efficiency.

Regulatory gaps occur when a particular market element requires oversight but is exempted from any form of regulatory oversight (either by virtue of statutory or discretionary exemptions). A possible unintended consequence of exemptions is that less oversight can sometimes cause markets to be less transparent, which in turn can favour the build-up of excessive risk. Such consequence highlights the need to revisit the underlying policy considerations of the exempt market on an ongoing basis. This re-evaluation is critical as it takes time to bring an exempt activity into the regulatory fold and there will likely be resistance to such steps on the part of market participants.

Lastly, new market activities often result in regulatory gaps due to their complexity, the time required to develop a proper and well-adapted regulatory response and the asymmetry of information between the regulator and market participants. The risk created thereby will be compounded if the element concerned has grown substantially in size or importance and regulators require time to develop an appropriate response.

C.2 External risks

A regulatory gap can arise when a systemically important area of the market falls outside the securities regulators' jurisdiction. Risk may find its source in instruments that, by definition, do not constitute securities or in entities/markets over which securities regulators do not have supervisory authority. It may be that the instrument, entity or market is supervised by another regulator, but in a different way, or simply unregulated. In the first scenario, it will be necessary for the securities regulator to cooperate and coordinate with the other regulator in order to ensure securities regulators' concerns are addressed. In the second, consideration should be given to bringing the area within its perimeter of regulation. By conducting regular reviews of the perimeter of regulation, as proposed in IOSCO's new Principle 7, regulators may uncover elements of their market that need to be monitored and/or regulated.

Regulatory gaps can be created when a market activity is duplicated outside the regulators' jurisdiction. Functionally similar activities should be regulated in a similar manner. In addition, as the securities market is increasingly interconnected with the rest of the financial system, risk can originate from other regulated segments, such as the insurance and banking sectors. In such cases, the risk intersects or passes through the securities market (e.g. the US sub-prime mortgage crisis). This reinforces the securities regulators' pressing need to take a more active role in the global effort to address systemic risk.

C.3 Other implications

Securities regulators must be mindful that systemic risk will often, if not always, travel across geographic boundaries and that regulation may unintentionally result in regulatory arbitrage. Effective regulation will therefore require coordination and cooperation among securities regulators internationally.

In addition, to avoid unintended consequences when developing or amending regulation,

securities regulators should take a longer-term approach and include systemic risk as a factor in any impact analysis conducted.

Figure A: Systemic Risk in Emerging Markets and the Global Financial Crisis³⁸

This Figure focuses on the emerging markets' experience with the global financial crisis, including the mechanism by which systemic risk was transmitted to such markets and the response of their policy-makers and regulators.

The global financial crisis affected emerging markets in a different way from the experience in many developed countries. IOSCO's Emerging Markets Committee (EMC) reported in 2009³⁹ that “[w]hile the direct exposure of emerging markets to sophisticated markets and products has been typically low, their exposure to the secondary impact of financial disruption may be just as high, if not higher, through global contagion. Indeed during the credit crisis, the impact of financial distress was evident in emerging markets – especially with regard to macroeconomic factors – even though the financial crisis primarily originated elsewhere.” Since then, as shown in consecutive IMF World Economic Outlooks, the financial and economic performance and outlook in many emerging markets has outstripped that of more developed economies.

The differences arose for several reasons:

- The build-up of financial system imbalances and systemic risk ahead of the crisis was much greater in the developed countries than in many emerging markets, and the crisis began in the global financial centres;
- Many emerging markets were somewhat less interconnected with and less dependent on the international financing centres than were some developed economies (partly due to lesser fiscal and current account deficits in emerging markets and developed country investors' reluctance to invest into longer-term emerging market assets);
- Securities markets remain generally a proportionately smaller part of the financial system in most emerging markets than in many developed countries, from the perspective of both issuers and investors;
- Many emerging markets had experienced severe systemic shocks in the recent past and had taken policy steps to minimize the likelihood of a recurrence such as building up large foreign currency reserves, which enabled them to meet portfolio outflows;

³⁸ This note has many sources, including “Impact on and Responses of Emerging Markets to the Financial Crisis, Final Report”, Emerging Markets Committee of IOSCO, September 2009 available at <http://www.iosco.org/library/pubdocs/pdf/IOSCOPD307.pdf>; and a paper by Shyamala Gopinath, *Macro-Prudential Approach to Regulation – Scope and Issues*, presented at the ADBI-BNM Conference on Macroeconomic and Financial Stability in Asian Emerging Markets, Kuala Lumpur, 4 August 2010, available at <http://www.bis.org/review/r100916d.pdf>.

³⁹ *Impact on and Responses of Emerging Markets to the Financial Crisis, Final Report*, Emerging Markets Committee of IOSCO, September 2009, paragraph 29, available at <http://www.iosco.org/library/pubdocs/pdf/IOSCOPD307.pdf>.

- Continuing economic development gave many emerging economies sufficient momentum to continue growing in the immediate aftermath of the crisis. This better enabled them to respond to the adverse effects of the crisis. Low interest rates in developed markets coupled with the potential for growth in developing countries increased their attractiveness to investors relative to the developed economies; and
- As a result, although emerging market economies faced severe outflows of short term portfolio investment flows and had to institute a variety of emergency actions, the impact on the real economy was less than in developed economies for the reasons stated above.

The transmission mechanism that brought the systemic shock to emerging markets had some special characteristics. As an exogenous shock (i.e. from outside), it came in three main forms:

- Trade finance froze in the 4th quarter of 2008, and exports and imports experienced a year-long sharp decline before a gradual recovery, which has been constrained by weak demand growth in developed economies;
- There was a sharp fall in domestic stock markets in emerging markets as short term foreign portfolio inflows reversed immediately because investors needed to hold liquid cash; and
- There were problems in rolling over financings in foreign markets which had temporarily frozen. However, very severe impacts were confined to those emerging markets where foreign banks that had been hard hit in their home countries comprised a big proportion of the domestic financial system (e.g. in many Eastern European countries).

Emerging markets policy-makers and regulators did not have to respond as drastically to the crisis as their peers in many developed countries. Nevertheless, the global financial crisis has led many emerging markets securities regulators to be more cautious about financial innovations and has heightened sensitivities over systemic risk.

Since the crisis, most major developed economies have adopted expansionary monetary policies as part of their strategies to stimulate economic recovery. The liquidity so created appears, at this stage, to be helping to support global growth and support some asset prices without inflationary consequences. However, the liquidity creation also appears to be putting upward pressure on some emerging markets' currencies and asset prices, increasing the potential for portfolio inflows into those countries. In some cases, the currency pressures have the potential to adversely affect the country's macroeconomic management.

The inflows into short-term debt and other portfolio investments represent a potential systemic risk, which may crystallise into acute financial and/or economic difficulties for the recipient economy if the inflows were to reverse sharply. Partly in response to these concerns, some emerging markets have been looking more favourably at the use of controls on capital inflows and exchange rate intervention or at other strategies to contain spill-over effects from developed country financial and economic developments.

Chapter 3 Initial Considerations for Identifying Systemic Risks

This chapter proposes some approaches and indicators that securities regulators might use in seeking to identify sources of systemic risk. The intent is to leverage existing approaches and information available rather than duplicate the work done by others, in particular by prudential regulators. The aim is to combine micro and macro-level indicators, which are strongly linked to increases in systemic risk arising from the securities markets with the view to inform securities regulators' action and policy.

The information that is currently being used by securities regulators for risk assessment can also be used in assessing systemic risk. Furthermore, additional data from other regulators can be compiled to look at flows and interactions between markets and jurisdictions and assess potential spill-over effects. This approach is in-line with IOSCO's new Principle 6, which states that "the regulator should have or contribute to a process to monitor, mitigate and manage systemic risks, appropriate to its mandate."

However, there are limitations in what is currently available in terms of systemic risk measurements. A different set of data will need to be developed for systemic risk measurement in securities markets. This information may come from other regulatory bodies and national statistical agencies as well as other sources (including SROs, trade repositories and CCPs).⁴⁰

A prioritization of risks is necessary to be able to reduce or mitigate systemic risk. However, prioritizing risks of various dimensions is not easily achieved. Existing approaches are at an early stage of development and have yet to be tested.

Another consideration in developing the risk measurements is the fact that regulators in various jurisdictions have varying levels of regulatory coverage and mandate. Some regulators have a focus on securities markets alone while others have a broader mandate with prudential supervision. It is important to highlight that not all indicators discussed in this paper will be useful to a particular regulator. Given the nature of risk transmission in the current financial systems and the impact on the different market participants' incentives and risk taking, it is important to acknowledge that all regulators should be aware of the macro environment they operate in. These issues are explored in greater detail in part B of this chapter.

Finally, Figure B provides a practical example of how the Canadian Securities Administrators (CSA) addressed the issue of identifying systemic risk in the Canadian securities markets.

A. What are securities regulators' existing approaches to identifying risks and how can they contribute to the identification of systemic risk?

A.1 Approaches for the identification of risk

Securities regulators, sometimes in conjunction with other financial supervisors in their

⁴⁰ The reason the data here is referred to as "new" is because it is new to securities regulators' role in systemic risk measurement although many of the datasets described in section B already exists (for example, data related to fiscal debt sustainability, movement of international capital, and the geopolitical environment).

jurisdiction, have different approaches to identify risks, which they use to determine their appropriate regulatory and supervisory efforts. Risk identification approaches typically contain a combination of analysis of risks within individual financial firms, issuers, products, transactions or markets. Risks within regulated entities are identified through regular contact with individual firms and the analysis of the firm's regulatory filings. Regulators assess solvency via the firm's balance sheet, external and internal risk and audit reports. Regulators also analyse the products and the processes of the firm, assess customer complaints and sometimes have discussions with senior management within the firms.

The risk identification process at the firm level can be followed up by an analysis of the risks that can have a broader impact on the markets or market segments in which the firm operates. Regulators share internally their views on these risks and conduct additional top-down analysis of risks.

Typically a top-down analysis of risk involves identifying risks that can affect the well-functioning of the market through the analysis of existing data on markets, products and market segments.⁴¹ Some regulators also survey or otherwise reach out to market participants to collect information on their risk exposure. Regulators map trends in relevant markets and study market behaviour. They look into operational risks, financial risks and risks of fraud. Commonly they analyze issues including:

- product markets and concentrations of holdings;
- debt and leverage of households and firms;
- the complexity of products or services;
- opacity and lack of disclosure, the pricing of products and services;
- incentive structures; and
- innovative products, services and technologies.

Following the financial crisis, regulators have stepped up their focus on risks and tried to address some of the challenges inherent to the risk identification process, such as the sharing of information across silos. For instance, the U.S. Securities and Exchange Commission has created a new division, called the Division of Risk, Strategy and Financial Innovation, and several regulators have established internal risk committees (refer to Figure B on the Canadian experience). At the European Union level, the Committee of European Securities Regulators (CESR) set up the Committee for Economic and Markets Analysis (CEMA) devoted to the identification, monitoring and assessment from a micro-prudential level of trends, potential risks and vulnerabilities in financial markets across borders and sectors, including financial innovation and incentives related to market practices both at the wholesale and retail level. Further, securities regulators are starting to use the information they gain through their day-to-day work and collection of data to identify potential misconduct or threats to market integrity, in order to also identify potential threats to financial stability. For example, the UK Financial Services Authority collects information on hedge funds in terms of their potential to generate systemic risk. Market surveillance data, which are traditionally

⁴¹ New post-crisis legislation in some jurisdiction where mandated use of trade repositories may assist in this regard.

being used to track price manipulation or insider trading, can also be used to monitor trends in the markets (such as the growth of high-frequency trading, and increase in liquidity and volumes to measure the maturing of a market and new entrants) and assess possible consequences⁴².

Securities regulators can also use the information they collect to identify specific trends in products or securities offerings. In particular, the EU's new Alternative Investment Fund Managers Directive will allow national authorities to collect data on the leverage used in alternative investments and to convey it to ESMA, which in turn will make a collective analysis of the levels of leverage. Taking into account the advice of the ESRB on this matter, ESMA may determine that the leverage used by an alternative investment fund manager (AIFM) or by a group of AIFM poses a substantial risk to the stability and the integrity of the financial system and may issue an advice to competent authorities specifying the remedial measures to be taken.

Although existing and developing approaches are not focused on the identification of systemic risk per se, they can be used to detect early signals of accumulation of risks and thereby contribute to the macro-prudential oversight of the risks in the financial system. In addition, new and more integrated approaches using a broader range of "red flags" should also be explored.

A.2 Approaches for the identification of Systemic Risk

In the current regulatory environment, there are a limited number of approaches employed by securities regulators with respect to identifying systemic risk. The existing approaches have not evolved into best practices, which may reflect the varying regulatory coverage of regulators as well as the early stage of development of systemic risk identification in securities markets.

Many regulators in the financial sector are currently developing approaches for identifying systemic risk and promoting financial stability. Most of the work, to date, has been done by prudential regulators and focuses on the banking perspective.

The challenge for securities regulators in adapting the prudential regulators' approaches is that they are not easily applied to securities markets. As a result, new approaches are needed to address systemic risk in a way that incorporates the intricacies of securities markets and the interplay between the various market participants.

The approach of securities regulators should initially focus on an analysis of the policy settings that foster an environment in which there are improper incentives for risk taking. Less risk-aware firms and investors can take on greater risk without a proper appreciation thereof. This leaves the more risk-aware firms with the choice of either joining in or risk losing market share (for example by not distributing nor investing in a product), thus driving the accumulation of risks in the system. An example from the recent financial crisis is the widespread distribution of and investment in securitized sub-prime assets by investment banks.

⁴² See for example, AMF, Working Paper n°9, *Equity trading: A review of the economic literature for the use of market regulators*, and especially, Chapter 3 which uses AMF market surveillance data (http://www.amf-france.org/documents/general/9541_1.pdf).

Another useful way of uncovering systemic risk is to look for knowledge gaps. Knowledge gaps can be more prevalent in the case of new or complex products, services and technologies. For example, investors typically do not appreciate the full spectrum of risks attached to more complex products.

Finally, it is important to identify where we have data gaps and try to fill these gaps with qualitative information such as regular intelligence gathering meetings with market participants. Often, the lack of easily available quantitative data can lead to regulators not focusing on potential risks. Qualitative information can help identify a potential problem and lead to more data gathering or surveys in that area.

A.3 Identification of Systemic Risk at a global level

Since the global financial crisis, there has been an elevated level of concern about the identification of systemic risk within securities markets, in particular, at the global level. This concern has prompted IOSCO to start building a research capacity. The organization has adopted a strategic direction which emphasizes the need for securities regulators to seek to identify, monitor and manage systemic risks. This Discussion Paper initiates the process of developing an approach for assessing systemic risk. The approaches under development will take into consideration the major issues being faced by regulators in assessing systemic risk.

At a global and regional level, the BIS, FSB, IMF, World Bank and ECB are developing various systemic risk frameworks, complemented by significant academic work. These approaches, mostly theoretical and from a banking perspective, could provide some guidance to the development of systemic risk approaches for the securities markets and will contribute to the dialogue between prudential and securities regulators on systemic risk.

B. Initial considerations in developing Systemic Risk indicators for Securities Regulators

This section offers a starting point from which securities regulators can consider indicators of systemic risk. The specific indicators that are listed in Appendix A are exploratory at this stage and are not meant to be exhaustive. Further work is needed to develop a better informed approach to achieve all encompassing measurements of systemic risk. More importantly, there needs to be sufficient consideration given to the practical application of macro level indicators that are traditionally tracked by prudential regulators or central banks. The intention here is to provide possible indicators of systemic risk which are relevant to the securities markets. While not a part of securities regulators' traditional toolkit, awareness of macro indicators can be most appropriate when developing early warning signs or *red flags*.

Chapter 2 of this paper included discussion of sources of risk and transmission mechanisms. Once a systemic risk becomes apparent through the transmission mechanisms it is much more difficult for a regulator to restore confidence in the market. As such, securities regulators should focus their efforts on indicators directed at sources of systemic risk. However, transmission mechanisms for systemic risks purposes should be well understood by securities regulators to better understand how the sources of risk may be interconnected. In particular, new developments which impact the transmission mechanisms, such as CCPs, as well as through the development of new services or products should be closely monitored.

B.1 Possible approaches in applying the indicators to assess Systemic Risks

The first task for securities regulators (and IOSCO) is to calibrate the systemic risk measures in practice. There will be considerable trial and error in coming to an assessment, on an aggregate basis, of the extent of systemic risk prevailing in the financial system. This assessment of systemic risk is a new task for most securities regulators and those that have the capacity to undertake the tasks should share their expertise and outcomes with others.

Some of the tools which could be developed by securities regulators to address systemic risk include scenario analysis and stress testing. These two methods complement and build on the indicators listed in Appendix A by identifying how and under what circumstances a build up of risk can turn into a systemic event, and therefore how and when regulators should respond to emerging risks.

Scenario analysis and stress testing can provide insight of the size of the risk, and if there is sufficient data available, even a reasonable measurement of the exposure. An example of a scenario analysis for a securities regulator addressing systemic risk is the simulation of an interest rate shock on the financial position of households and on the financial institutions by the AFM of the Netherlands.⁴³ The analysis provided insight on the potential vulnerability of the financial system in the case of an interest rate shock, which also had securities market implications through unit linked mortgages held by banks.⁴⁴ The French AMF also recently analysed the potential effects of rebalancing leveraged and inverse ETFs on the underlying equity market assuming various changes in the index⁴⁵. Other scenarios could involve stress testing market infrastructure providers or the impact of the failure of a major player in a market.

B.1.1 Qualitative and quantitative approaches

An effective assessment of systemic risk will always draw on two distinct but complementary approaches: a detailed and well developed quantitative data architecture based on robust data and a qualitative assessment that relies more heavily on expert views and local jurisdictional experience. Initially, IOSCO will have to rely more on a qualitative approach since the data required for a more quantitative approach is lacking. In the future, the availability of data will improve, and more quantitative approaches can be developed, either through the collection of data at a global level through IOSCO's research capacity (i.e. Research Unit) or, to the extent permitted by national law, through its members.

The first step in a systemic risk analysis is to conduct an assessment of the potential impact under certain scenarios in order to prioritize those risks. The potential impact of a risk should be quantified in absolute monetary terms or be expressed as a proportion of a relevant benchmark, such as the asset market size or the infrastructure providers' balance sheet in order to get a sense of scale and the interconnectedness to the system (qualitative impact

⁴³ *Interest Rate Risk. The Consequences of an Interest Rate Shock for Households in the Netherlands*, 2005, AFM.

⁴⁴ Amongst others, unit linked mortgage was a product in the Netherlands that had a strong link between household finance and the securities markets.

⁴⁵ *Effects of rebalancing leveraged and inverse ETFs on the underlying equity market*, Economic and Financial Newsletter, pp. 7-12, December 2010, AMF.

determination).

Given the lack of data, precise estimates of an impact will often not be achievable. Sometimes data will only be available for one country, one market segment or one firm. In such cases, scenario analysis and stress tests cases will be carried out by extrapolating data in order to give an indication for other jurisdictions and/or the global market.

A second step in the risk analysis and an even more difficult task is the determination/assessment of a probability of a systemic risk turning into a systemic event. Again, scenario analysis and stress testing will only give insight on the possibility that an event may occur. However, since it is extremely difficult, if not impossible, to foresee the timing of large impact events, one can expect only to determine a scale of *high*, *medium* and *low* probability, if at all.

Finally, the approach should classify the risks by linking the potential impact and the probability together. The resulting classification is important to prioritize the mitigation efforts of regulators and IOSCO. One possibility might be to classify in a simple scheme: red, amber and green alert, with a red alert potentially requiring a prompt IOSCO and/or regulatory action to mitigate this risk.

B.1.2 Systemic Risk indicators and the financial crisis

One beneficial use for this approach would be to see how it might have performed during the most recent crisis and use the results to help identify *lessons learned*. A good warning system would have indicators that moved from green in the early nineties to amber and then to red in the mid-2000s, as leverage built up and risks developed, accumulated and became concentrated. Many of the indicators identified (in Appendix A), when fully developed, should reproduce such a progression. For instance:

- Macroeconomic indicators would have shown above average credit growth, abnormally low risk-adjusted cost of credit, considerable asset overvaluation as well as large and concentrated international capital flows;
- Micro indicators would have shown rapid growth in new credit products and investment vehicles, heavy asset concentrations among SIFIs, heavy reliance on quantitative risk modelling and credit ratings and growing uninsured exposures to credit market liquidity mismatches;
- Size indicators would have shown tremendous growth in CDOs, CDSs, balance sheets, and leverage;
- Interconnectedness indicators would have revealed expanding and intensifying counterparty exposures and credit market exposures, both within jurisdictions and internationally;
- Transaction indicators showing the positions and valuations of those positions would have assisted in identifying concentrations in the industry;
- Concentration indicators would have revealed increasing exposures among SIFIs to overpriced assets whose risks had been severely underpriced;

- 'Behavioural' indicators would have shown worrisome trends in business models, investment strategies and risk exposures; and
- 'Regulatory' indicators would have revealed strong growth in unregulated and lightly regulated market segments, and evidence of regulatory arbitrage.

The challenge is obviously to identify indicators also able to spot future vulnerabilities.

B.2 Issues and challenges

B.2.1 Issues with data collection and risk measurements

Although there is a consensus at the international level to develop systemic risk measurements and provide analyses and solutions to mitigate those risks, there are some strong reservations on the effectiveness of such an approach given the complexities in aggregating such measures. The existing data is fragmented with gaps in data availability. Timeliness of the data is also a concern as much of the existing data takes time to compile and release, increasing the risk that this data may be 'stale' or out of date by the time it is available to regulators. Stale data may still offer some value after the fact but may be of little use in predicting upcoming crises. On the international front, data comparability is an issue given the inconsistencies in securities market data. For example, there is no consensus on risk measurements such as leverage. This factor further limits the ability to use data in risk measurement that often involves aggregation of risks.

The need for better data is also addressed by the FSB and IMF in their report titled *The Financial Crisis and Information Gaps*.⁴⁶ A key area of concern is the lack of data availability at the international level as supported by two key points in the report:

- *Closing all the gaps will take time and resources, and will require coordination at the international level and across disciplines, as well as strong high-level support. The legal framework for data collection might need to be strengthened in some economies.*
- *Flexibility and prioritization in the timetable of implementation will be needed to account for the countries' level of statistical development and resource constraints.*

B.2.2 Legal ability to share information across regulators globally and within a country (between the prudential and the markets regulator)

Regulators are in a position to collect market information legally and going forward they should exercise their powers to collect timely and relevant information to feed into the approaches under development. Sharing information both regionally and internationally will provide an added dimension that is very important to understand risk development as it has been proven from the recent financial crisis, which was global in nature even though the source was very much local.

⁴⁶ Supra note 7.

The ESRB stresses the importance of the development of an appropriate infrastructure for pooling such information on an EU-wide basis which will require substantial analytical and data-related expertise, as well as market knowledge. Work is already under way to set up procedures for regular information-sharing between the ESRB and the European Supervisory Authorities⁴⁷. Information-sharing will also have to be strengthened at the international level.

B.2.3 Cooperation

Traditional risk measurement approaches do not take into account the interconnectedness. There needs to be a new model that takes into account the impact from non/less-regulated entities such as shadow banking, alternative trading systems (ATs), and non-bank lending institutions. There is also difficulty in forecasting trigger events and human behaviour, as well as foreseeing asset bubbles. All of these measures are difficult to quantify. To resolve some of these concerns a multidisciplinary approach is needed where all participants/regulators would coordinate an international and comprehensive approach to systemic risk measurement.

The modern information infrastructure is conducive to the sharing of timely information as long as there is an agreement to do so. In order to facilitate this, there needs to be an internationally coordinated effort for data collection and sharing in order to better assess risks emanating from various regions of the world.

B.2.4 Resource constraints

Additionally, the lack of technical resources for systemic risk analysis is an obstacle in effectively monitoring and mitigating systemic risk and is encountered by securities regulators worldwide. Securities regulators have traditionally focused on market conduct and could lack some of the skilled professionals such as economists and statisticians as well as financial analysts with market experience that are needed to develop systemic risk analysis frameworks. Similarly, many regulators will need to build the IT infrastructure needed to store and analyse large volumes of data. These are important factors that influence the ability not only to develop new methods to measure systemic risk, but also to better use the existing data, information and expertise needed to monitor and mitigate systemic risk.

Figure B: The Canadian Experience

Assessment of Systemic Risk in the Canadian Securities Market

In October 2009, the Canadian Securities Administrators (CSA)⁴⁸ formed a committee (the

⁴⁷ The three European Supervisory Authorities are the European Securities Markets Authority (ESMA), the European Banking Authority (EBA) and the European Insurance and Occupational Authority (EIOPA).

⁴⁸ The Canadian Securities Administrators (CSA) is a voluntary umbrella organization of Canada's provincial and territorial securities regulators whose objective is to improve, coordinate and harmonize regulation of the Canadian capital markets, to ensure the smooth operation of Canada's securities industry and to ensure close collaboration in securities law enforcement. The CSA's mission is to give Canada a harmonized securities regulatory system that (a) provides protection to investors from unfair, improper or fraudulent practices, (b) fosters fair and efficient capital markets, and (c) reduces risks to market integrity and to investor confidence in the markets, while retaining the regional flexibility and innovation that characterize the Canadian system of provincial and territorial regulation.

Committee) to develop processes to identify, analyse and monitor systemic risk in the Canadian securities markets, to make an assessment of existing systemic risk therein and to make recommendations on potential steps to mitigate the identified systemic risks. Members assigned by the various participating provincial and territorial securities regulators to the Committee have a diverse range of experience in securities regulation.

The Committee developed an assessment process based on defining systemic risk from the perspective of securities regulators and categorizing the securities market in a top-down fashion. This approach considered groups of entities and market activities in addition to single entities of significant size and importance. Initially, the Committee identified seven key elements of the Canadian securities market: market participants, markets, market service providers, clearing and settlement systems, investment products, selling practices and market activities, and regulators and/or other oversight organizations. Within these elements, the Committee identified over 50 categories for consideration of the types of risk. Of these categories, the following were selected for more in-depth study: OTC derivatives, clearing and settlement systems and central counterparties, hedge funds, direct market access, electronic trading, credit rating organizations, repos, securitized investments, investment dealers, custodians and commodity indices. In addition, the Committee investigated the role that each of counterparty risk, funding liquidity risk and market liquidity risk play with respect to systemic risk. For each of the selected categories, the Committee assessed the potential for systemic risk based on the guidance from the FSB/IMF/BIS October 2009 report⁴⁹. As part of the assessment of systemic importance to securities regulators, the Committee also considered jurisdiction and the perimeter of regulation.

After prioritizing the categories on a preliminary basis, the Committee began identifying specific sources of systemic risk. The identification of systemic risk was conducted through a variety of methods including academic review and consultation with subject-matter experts within the CSA or other regulators. The potential systemic risks that were identified most commonly stemmed from actual or potential concentration, interconnectedness, large counterparty exposures and opacity. Less frequently, the identified risks reflected high levels of potential leverage, moral hazard and market innovation/regulatory gaps. The Committee also identified potential causes for each risk and potential mitigation steps, including monitoring of existing or new data, amending regulation or policy, and further cooperation with other regulators. In many cases, the Committee concluded that some areas of potential concern were already being considered as part of the existing policy development process within the CSA. For example, CSA committees were already considering steps to address risks associated with OTC derivatives and credit rating agencies.

⁴⁹ FSB, IMF and BIS (2009) *supra* note 7.

Chapter 4 Mitigating Systemic Risk and Promoting Financial Stability

This chapter gives guidance to securities regulators on how they might work to reduce the likelihood and severity of outbreaks of financial instability in their jurisdictions. The measures are mainly preventative in effect. The aim is to create the conditions under which market participants can more accurately manage their risks and price those risks, and interests of agents, intermediaries and gatekeepers can be more strongly aligned with those of investors.

Should systemic risk nevertheless emerge, and regulators *indicator boards* begin flashing red, tools available to regulators can also be used in whatever fashion is appropriate for mitigating developing risks. For example, the development of high degrees of leverage and concentrations of risk in a lightly-regulated segment of the market can be met with the introduction of greater transparency regarding open positions and exposures, limits on participants' leverage as well as a communications strategy aimed at bringing potential risks to the market's attention.

However, the tendency for systemic risk to emerge in areas outside of securities regulators' control, such as the macroeconomic environment, means that they can arise in spite of the best efforts of regulators to create well-functioning, transparent and efficient markets that are rich in information.

In such instances, securities regulators should, sometimes acting in conjunction with other financial market supervisors, raise the risk awareness (of market participants, other regulators and legislators) so as to limit the development and accumulation of risks and thereby mitigate the impact of risks posed to the financial system.

The first part of this chapter reflects on the findings of the earlier chapters and describes the policy and regulatory tools available to securities regulators which can help prevent the development of systemic risk in the system. The second part of the chapter describes IOSCO's current and developing role with respect to systemic risk.

A. Tools available to securities regulators

Securities regulators have specific tools that can reinforce the stability of the financial system. Actions can be taken to address both risk transmission mechanisms as well as sources of systemic risk emanating from within or passing through securities markets.

Securities regulators should carefully consider unintended consequences that may follow from any risk mitigating measures, taking into account, inter alia, the degree to which a new measure may invite compliant behaviour that may actually increase correlation or construct new feedback loops. For example, before imposing a new measure, regulators should consider if it could cause market participants to adopt similar behaviour to such a degree that it would decrease market diversity. Also, introducing a measure may merely move the problem elsewhere, or may even concentrate it and thus may introduce a "single point of failure."

In order to minimise the chance of being confronted with unintended outcomes, any measures taken should be proportionate to the identified risks. Also, while such measures will often aim to mitigate risks that are international in nature, they have to be tailored to the

needs and particularities of the market in which they are to be implemented.

The following section describes the tools available to securities regulators.

A.1 Policy and regulatory tools

Interventions by securities regulators can be grouped into five broad categories:

- i. transparency and disclosure;
- ii. business conduct oversight (rules and other interventions aimed at shaping the behaviour of market participants);
- iii. organisational, prudential and governance requirements;
- iv. prevention of risk transmission; and
- v. emergency powers.

These forms of intervention can be useful in addressing the various sources of systemic risk once they have been identified. For instance:

- Risks arising from size and interconnectedness can be reduced through:
 - limiting the exposure one entity can have to another, or restricting the presence of common personnel across interconnected entities (such as shared company directors) or disclosing potential conflicts of interest arising from such shared company directors;
 - requirements to disclose the extent of exposure to other entities; and
 - business conduct rules – e.g. limiting the conflicts of interest which can exist in the conduct of normal business.
- Lack of transparency can be resolved by introducing more stringent product and market disclosure requirements.
- 'Lack of substitutability' and 'concentration' issues can be addressed by introducing policies which encourage competition and putting in place market rules such as large trader reporting requirements and position limits.
- Risks arising from leverage can be addressed directly through prudential requirements which limit the amount of leverage taken on by an entity, or indirectly via disclosure, imposition of obligations or other incentives.
- Issues relating to market participants behaviour can be mitigated through organisational and governance requirements (e.g. those targeting remuneration practices).

It is important to note that greater transparency and strong business conduct oversight are not

only mitigating tools but can also be reliable identifiers of emergence of systemic risk in the market (see Chapter 3 above).

A.1.1 Transparency and disclosure

Transparency is fundamental for price formation, assessing risks, overcoming information asymmetries and maintaining market confidence. It also establishes standards that permit the marketplace to contribute constructively to policing excessive risk taking. The traditional tools of transparency and disclosure will help securities regulators identify concentrations of risk that may warrant further regulatory or legislative responses. It is the responsibility of securities regulators to ensure the appropriate level of transparency about products and markets and the integrity of information provided to the market.

Product transparency

Enhancing the transparency around financial products should give investors the necessary information to assess the risks attached to them and, as a result, make better investment choices. Opacity, especially in an overconfident market, can encourage collective behaviour which can lead eventually to widespread losses, with adverse consequences for the real economy.

Improved transparency also enhances investors' ability to conduct their own internal risk assessments of investment products. The G-20 has recommended the removal of regulations which encourage investors to rely exclusively on external credit ratings. The new regulatory frameworks for credit rating agencies will also foster greater transparency in their methodologies. Enabling institutions to better understand external ratings and to expand their internal credit risk assessments will ensure better discipline and reduce the potential for systemic instability.⁵⁰

Market transparency

Market transparency contributes to an effective price formation process and to the integrity of markets. At the same time, it can facilitate the detection of potential risks and help contain panic in times of stress. The reform of the OTC markets, including the development of trade repositories and the promotion of more exchange trading and centralised clearing, will greatly increase transparency to both regulators and market participants. Other initiatives are being considered in the U.S. and Europe regarding commodity derivatives markets (e.g. CFTC's weekly publication of its Commitments of Traders report) or, in Europe, the disclosure of information regarding net short positions, above certain thresholds, to the regulators and to the market (the proposal covers both shares and sovereign bonds).

The March 2009 Commodity Task Force report⁵¹ built on these initiatives, and called on all futures markets regulators to have access to information that permits them to identify concentrations of positions and the overall composition of the market, including the authority to access a traders' related financial and underlying market positions. Jurisdictions were

⁵⁰ The Financial Stability Board, of which IOSCO is a member, has developed a set of principles to reduce reliance on credit ratings: see http://www.financialstabilityboard.org/publications/r_101027.pdf

⁵¹ *Task Force on Commodity Futures Markets*, Report of the Technical Committee of IOSCO, March 2009, available at <http://www.iosco.org/library/pubdocs/pdf/IOSCOPD285.pdf>.

called upon to review the scope of their authority, and if necessary, take affirmative steps to request the necessary powers legislatively.⁵² While these recommendations were made in the context of commodity derivatives, they are equally applicable in other markets.

In the equity markets, the *flash crash* of May 6 2010 highlighted some transparency risks, as delays and complexity in obtaining and aggregating market data to form a complete picture of the different trading facilities may have exacerbated uncertainty in the market and contributed to liquidity drops.

As for the fixed income markets, where the bulk of the transactions are OTC, some regulators have analysed the implications of the lack of transparency, focusing especially on investor protection and price formation consequences. This is the case in the U.S. where the corporate bond market has had a mandatory reporting system since 2002. In the E.U., the issue is still under discussion. Now, in the aftermath of the financial crisis, securities regulators should also take into account the usefulness for financial stability monitoring of having available more price and volume information in the fixed income markets.

Financial and risk disclosure

Accurate financial and risk disclosure is important for market participants because:

- it is essential to maintaining the confidence of shareholders;
- it potentially impacts market confidence generally;
- as shown during the financial crisis, it allows broader monitoring of financial soundness indicators and risks accumulating in the financial system; and
- perhaps most importantly, a disclosure framework facilitates the pricing of risks and investments.

Securities regulators focus on full financial and risk disclosure in the interest of investor protection and market integrity. In contrast, prudential regulators often emphasise the importance of confidentiality to manage the risks of potential runs on financial institutions in crisis situations. The financial crisis and other recent developments suggest that transparency and disclosure have become essential from a prudential perspective. A good example of the importance of transparency is the publication of the stress test results for the banking sectors in the United States (July 2009) and in Europe (July 2010) and detailed information about individual banks' exposures to specific products risks that markets were concerned about. These removed some uncertainty in the market by giving investors information to help them assess the size of capital gaps or to extrapolate additional stress scenarios for specific institutions.⁵³ In the wake of the financial crisis it has also become routine for banks to

⁵² *Task Force on Commodity Futures Markets*, Report to the Technical Committee of IOSCO, March 2009, available at <http://www.iosco.org/library/pubdocs/pdf/IOSCOPD285.pdf>. See also the recent *OR08/10 Task Force on Commodity Futures Markets Report to the G-20*, November 2010, available at <http://www.iosco.org/library/pubdocs/pdf/IOSCOPD340.pdf>.

⁵³ See for instance, Donald P. Morgan, Stavros Peristiani, Vanessa Savino, *The Information Value of the Stress Test and Bank Opacity*, Federal Reserve Bank of New York, Staff Report n°460, July 2010; available at http://www.ny.frb.org/research/staff_reports/sr460.html. „*Stress-testing Banks in a Crisis*, pp. 117-125, Financial Stability Review, European Central Bank, December 2010 available at

disclose information on capital ratios that had traditionally been treated as confidential.

Regarding risk disclosures in general, the implementation of the Financial Stability Forum's 2008 recommendations is currently under review; the general objective being to ensure reliable valuations and disclosures of the risks that are most relevant to market conditions at a particular time.⁵⁴

A.1.1 (a) How might enhanced transparency and disclosure have helped mitigate the crisis?

Enhanced transparency and disclosure might have mitigated the risks which helped create the crisis by showing more clearly to regulators and market participants the problems that were emerging in the financial system. Greater transparency might also have filled the knowledge gaps which resulted in an under-pricing of risk in the lead up to the crisis.

Rules which encourage institutional investors to use their own risk assessments alongside those of credit ratings agencies, rather than encouraging them to rely exclusively on those ratings, might have tempered the strong demand for sub-prime securitised assets and encouraged pricing which more accurately reflected the risks that they carried. The use of trade repositories and centralised clearing of derivatives contracts would have allowed regulators and market participants to identify accumulations of risks at financial institutions, such as AIG, and to check that these risks were being managed and insured against adequately. As for financial sector stress tests, they might have identified threats to the financial system arising from changes in the macroeconomic environment, such as falls in demand for housing.

A.1.2 Business conduct oversight

Securities regulators have the primary responsibility for business conduct oversight. This includes rules directed to the qualifications of market participants and to managing or prohibiting conflicts of interest.

The recent global financial crisis highlighted the extent to which investor protection issues, combined with weakened diligence from investors, can lead to systemic risk. Indeed, the crisis has demonstrated that consumer problems with the promotion and distribution of sub-prime mortgages were an early warning signal, indicative of a deeper systemic problem. Strong regulation and oversight of market intermediaries and other market professionals are thus necessary to ensure sound business practices and the protection of investors' interests, and to contribute to financial stability. In particular, business conduct rules need to address conflicts of interest, including the prohibition of inappropriate practices in certain cases. Furthermore, active enforcement of the rules is also necessary, as this clearly influences market participants' behaviour and can limit the development of risks.

When considering the potential for undesirable selling practices, securities regulators should take into consideration economic incentives (for instance, heavy reliance on commission-

<http://www.ecb.int/pub/fsr/shared/pdf/ivafinancialstabilityreview201012en.pdf?d80416324a10f3cb4149e717e226311e>.

⁵⁴ *FSB invites feedback on risk disclosure practices*, Financial Stability Board, July 2010, available at http://www.financialstabilityboard.org/press/pr_100721.pdf.

based remuneration driving churning), and the impact of economic and financial conditions on the business models of the different types of market participants (for instance, the search for yields in the context of a prolonged period of low interest rates) as well as product characteristics (e.g. complex products). In some cases, regulators should be able to increase business conduct requirements; they should also be able, together with the systemic risk bodies in their respective jurisdictions, to restrict certain activities which might threaten the overall stability of the financial system.⁵⁵

A.1.2 (a) How might enhanced business conduct oversight have helped mitigate the crisis?

Actions aimed at changing incentive structures in order to better align the interests of financial intermediaries and agents more closely with those of investors would have helped address risks which arise from conflicts of interest. Ensuring intermediaries who promoted securitised products be exposed to similar risks as they were passing on to investors, and to face consequences resulting from investor losses, might have encouraged a critical appraisal of the value of those securitised products. It might have also allowed investors to move their business away from agents who shied away from such risk sharing.

More active monitoring of business models and practices by securities regulators might also have alerted regulators and investors to emerging problems at financial institutions.

A.1.3 Organisational, prudential and governance requirements

These requirements provide incentives to market participants to better manage the risks which may have systemic impacts; in short, they provide incentives to internalise externalities to the firm. These could include risk based prudential requirements, requirements about risk management and compliance functions and broader governance arrangements (including principles about compensation) and arrangements which support effective management of conflicts of interest. In particular, supervisors should put more emphasis on qualitative assessments of risk management techniques and culture within firms, rather than leaving the onus solely on the firms to comply with a series of requirements. This would prevent the exercise from becoming a mere mechanistic one by both the firms and regulators.

Following IOSCO's initial report on the subprime crisis, published in 2008,⁵⁶ securities regulators have reviewed internal control systems of financial firms to assist with and supplement the work undertaken the Basel Committee on Banking Supervision (Basel

⁵⁵ The European Securities Markets Authority, ESMA, “may temporarily prohibit or restrict certain financial activities that threaten the orderly functioning and integrity of financial markets or the stability of the whole or part of the financial system in the Union (...) or if so required in the case of an emergency situation (...)”. In the United States, the Financial Stability Oversight Council’s response to “grave threats” includes limiting the ability of the company to merge with, acquire, consolidate with, or otherwise become affiliated with another company; restricting the ability of the company to offer a financial product or products; requiring the company to terminate one or more activities; imposing conditions on the manner in which the company conducts one or more activities; or, if the Board of Governors determines that [such] actions are inadequate to mitigate a threat (...), require the company to sell or otherwise transfer assets or off-balance-sheet items to unaffiliated entities.

⁵⁶ *The Role of Credit Rating Agencies in Structured Finance Markets*, Report of the Technical Committee of IOSCO, Consultation Document, March 2008, available at <http://www.iosco.org/library/pubdocs/pdf/IOSCOPD263.pdf>.

Committee). IOSCO's August 2010 Consultation Report on *Intermediary Controls associated with Price Verification of Structured Finance Products*⁵⁷ discusses issues such as analytical capabilities for price verification, risk culture and governance processes, tests and hedging strategies; the document also shares observations on best practices. This work stresses again the role of market prices and the importance for market participants to assess correctly prices and liquidity in order to understand the actual level of risk for the firm. Additional risks are discussed, such as the concentration of positions and the building up of positions. Lastly, the document highlights the role of supervisors and other tools to help discourage or prevent excessive risk taking, such as imposing restrictions on firms from engaging in a particular line of business where the firm falls below certain capital levels or where the firm violates other material requirements imposed by the regulator.

While most efforts have focused on banking institutions and securities firms, a significant change since the crisis has been a new focus placed on the risk management practices of asset managers. An IOSCO report published in July 2009 focuses on investment managers' due diligence when investing in structured products.⁵⁸ More recently, in Europe, new rules oblige asset managers to employ sufficiently robust and effective procedures and techniques so that they are able to manage adequately the different types of risk that their assets under management might face. Periodic back-tests and stress tests will likely become more widespread, and there will be more emphasis on the independent assessment of the value of OTC derivatives positions. These developments, which will require significant efforts in terms of resources and skills at the level of the asset managers, will foster better and more continuous assessment of risks and contribute to restraining excessive risk taking.

A second important matter to address is remuneration. The principles and implementation standards on remuneration developed by the FSB seek to avoid excessive risk taking and prevent conflicts of interest by aligning remuneration practices with risk management.⁵⁹ They have been translated into banking regulation and the FSB has conducted a peer review of implementation. The results published in March 2010 highlight notably the need for convergence and coordinated efforts to prevent regulatory arbitrage and transfers of risks between jurisdictions or between various parts of the financial system.⁶⁰ Those principles on remuneration are now finding an echo in the rest of the financial industry (for instance, in the European asset management industry)⁶¹, while taking into consideration the specificities of

⁵⁷ *Intermediary Internal Controls Associated with Price Verification of Structured Finance Products and regulatory Approaches to Liquidity Risk Management – Consultation Report* Report of the Technical Committee of IOSCO, August 2010, available at <http://www.iosco.org/library/pubdocs/pdf/IOSCOPD331.pdf>

⁵⁸ *Good Practices in Relation to Investment Managers' Due Diligence When Investing in Structured Finance Instruments*, Report of the Technical Committee of IOSCO, July 2009, <http://www.iosco.org/library/pubdocs/pdf/IOSCOPD300.pdf>.

⁵⁹ *FSB Principles for Sound Compensation Practice*, Financial Stability Board, 25 September 2009, http://www.financialstabilityboard.org/publications/r_090925c.pdf.

⁶⁰ See *Thematic Review on Compensation*, Financial Stability Board, 20 March 2010, available at http://www.financialstabilityboard.org/publications/r_100330a.pdf. The report notes material progress in areas such as governance, supervisory oversight and disclosure but identifies several issues yet to be resolved in order to raise standard of risk adjustment to pay structures across the industry. It recommends additional measures and further convergence, as well as expanding the coverage of significant nonbank financial institutions.

⁶¹ At the European level, the Alternative Investments Funds Managers Directive (AIFM) requires that managers set-up remuneration policies and practices, notably being consistent with the effective risk management and designed to avoid non-appropriate risk taking. The future round of European

the various business models involved.

A.1.3 (a) How might enhanced organisational, prudential and governance requirements have helped mitigate the crisis?

A key lesson learned from the financial crisis was that many market participants misunderstood the nature of the risks attaching to their investments and underestimated the scale of those risks. Regulatory standards outlining how asset managers should assess risks would have encouraged a greater understanding of the risks developing in financial systems around the world, so thereby encouraging a more accurate pricing of those risks and contributing to their mitigation. Combining these standards with limits on risk taking would have further attenuated the risks.

Another key lesson of the crisis was that poorly designed incentive structures can encourage imprudent risk taking on a scale sufficient to threaten financial stability. Having remuneration aligned more closely with risk management would, as with the measures noted above, have helped mitigate systemic risk by encouraging a more accurate pricing of risks.

A.1.4 Prevention of risk transmission

Securities regulators can use different policy and regulatory tools to prevent or limit contagion/risk transmission.

Trading rules

In the new trading environment characterised by the increased speed of transactions and high level of integration between markets, trading infrastructures must be subject to strong rules to prevent outages as well as to ensure their robustness in case of shocks. As market prices contribute to interdependencies between markets and institutions (e.g. valuation, mark-to-market type rules and other possible feed-back effects), regulators should ensure that price formation processes are effective and robust.

Regulators are currently reviewing the existing parameters regarding various “circuit breakers” in order to determine whether revisions might provide greater time for market participants to reassess their strategies and resume trading in a fair and orderly fashion and for algorithms to reset their parameters and help prevent extreme price movements. At the same time, regulators are reviewing existing requirements relating to order and trade cancellation policies, as well as other information sharing mechanisms that should also be in place. Another example of measures which can contribute to the prevention of risk transmission relates to settlement rules, including fines and close-out– requirements. Similar rules across markets, accompanied by sizeable fines in case of settlement fails or other measures such as close-outs, decrease arbitrage and the potential for disorderly settlement as well as naked short selling.

legislative initiatives for the asset management industry (UCITS V, following the passage of UCITS IV last summer) should try aligning remuneration frameworks between UCITS, AIFM and CRD; the recent consultation from the European Commission will address the topic of remuneration. At the domestic level, France has recently adopted a new industry code and there is an on-going consultation in the UK.

Counterparty risk, interconnectedness and the role of CCPs

Central clearing is intended to reduce the overall amount of risks in the market and address the issue of interconnectedness in the markets, by reducing multiple exposures and by substituting a central counterparty in place of a counterparty member. CCPs strengthen a market by holding its members to robust standards and requiring them to contribute to a clearing fund which buffers against a member insolvency and default on its position. It also encourages more rigorous risk discipline from market participants and limits the amount of risk taking through the imposition of collateralisation practices and margin calls. When central clearing is not possible (depending on the characteristics of the product), regulators should encourage other risk management techniques, such as higher capital requirements (as foreseen in the new Basel III framework), more rigorous counterparty analysis or oversight of collateralisation practices at the firm level.

Given this increased CCP role envisioned by proposed reforms of OTC markets, regulators and supervisors must ensure that they are subject to stringent business conduct rules and harmonised organisational requirements to ensure their soundness. IOSCO has established a Task Force on OTC Derivatives Regulation to develop consistent international standards related to OTC derivatives regulation in the areas of clearing, trading, trade data collection and reporting, and the oversight of certain market participants.⁶² In addition, IOSCO and the Committee on Payment Systems and Settlements (CPSS) are currently engaged in reviewing the regulatory standards that apply to payments, clearing and settlement arrangements, including central counterparties.⁶³

Liquidity risk

The last financial crisis has highlighted the systemic role of liquidity and the questions around its availability in times of stress. In addition to the work taking place to better address liquidity risk in the banking sector, securities regulators have engaged in a significant review of liquidity regimes applying to securities firms. The Consultation Report published by IOSCO in August 2010 highlights the lessons learned from the financial crisis, the necessary changes to liquidity regimes and the need for increased supervision of liquidity risks.

A separate work stream for securities regulators focuses on liquidity risk for mutual funds and collective investment schemes. The crises in the money market fund industry during the financial crisis, and especially following the bankruptcy of Lehman Brothers in September 2008, underline the importance of the well functioning of the funds market for the financial system and the possibility of runs on money market funds.⁶⁴ Securities regulators have taken steps to improve fund liquidity management (e.g. through suspensions of fund redemptions

⁶² *IOSCO forms Task Force on OTC Derivatives Regulation*, Press Release, 15 October 2010, available at <http://www.iosco.org/news/pdf/IOSCONEWS191.pdf>.

⁶³ *IOSCO and CPSS consult on policy guidance for central counterparties and trade repositories in the OTC derivatives market*, Press Release, 12 May 2010, available at <http://www.iosco.org/news/pdf/IOSCONEWS182.pdf>.

⁶⁴ See also *Money Market Funds Report*, U.S. President's Working Group on Financial Markets, October 2010, available at <http://www.treasury.gov/press-center/press-releases/Documents/10.21%20PWG%20Report%20Final.pdf>. The report acknowledges the positive reforms implemented since the financial crisis but considers that more should be done to mitigate the systemic risk associated with money market funds and reduce their susceptibility to runs. The report discusses a number of policy options.

and the use of gates/side pockets) which can help prevent fire sales and runs on funds. While the issues at stake and the potential regulatory solutions are fundamentally different from the banking sector, the potential impact of poor fund management liquidity will require increased scrutiny on the part of securities regulators (not only with respect to money market funds), and possibly the elaboration of further international standards.

A.1.4 (a) How might measures against risk transmission have helped mitigate the crisis?

One problem encountered by market participants during September and October 2008 was tremendous uncertainty about which financial institutions were exposed to what risks. This contributed to the rapid disappearance of liquidity. Institutions were forced into distressed sales of assets causing price falls. The use of central counterparties, trade repositories and exchange trading of derivatives would likely have helped reduce the severity of the crisis by reducing counterparty exposures and uncertainty in the market. Data availability on OTC trades would have helped market participants and regulators better identify the build-up of risks in those markets and take actions.

While they would have been helpful in keeping money markets liquid and so staving off losses of confidence during the crisis, rules about fund liquidity management might also have helped prevent the crisis by making asset managers more aware of liquidity risk. The years prior to the crisis were marked by a grave underestimation (and so underpricing) of liquidity risks, and the accumulation of these risks contributed to the severity of the crisis. Awareness of the importance of liquidity and its accurate pricing would thus have mitigated the risks which developed in money markets before September 2008.

A.1.5 Emergency powers

In the event that there are market disruptions that could develop into a major shock, regulators may have to take emergency action, for instance by temporarily suspending or halting trading activities in certain securities, or by temporarily restricting certain market activities, such as short selling. These are important and drastic measures that should only be exercised in periods of high stress with the objective to prevent an adverse sequence of events and amplification of market moves and to help market participants absorb information and reassess their strategies. Those types of measures can also have unintended consequences, for instance if market participants take positions in other related markets, where emergency rules do not apply. On such occasions, coordination between regulators (nationally and internationally) becomes crucial for emergency measures to be effective, which explains why it is a key function of the systemic risk committees in many jurisdictions.

A.2 Raising awareness: Collaboration with other regulators and communication tools

Securities regulators should regularly engage in dialogue with relevant supervisors and regulators to ensure sufficient attention is being given to systemic risks arising from or passing through securities markets. By communicating their systemic risk concerns, securities regulators can raise awareness and help initiate actions from other regulators and

financial authorities, or, when needed, from legislators.⁶⁵

A.2.1 Collaboration

Intra-jurisdictional communication and exchange of information among regulators about systemic risk is essential to help prevent the emergence of gaps in oversight and identify possible transfers of risks or cross-sectoral risks. In some jurisdictions, the creation of systemic risk oversight bodies should facilitate communication and collaboration among regulators. Securities regulators can reinforce their work by leveraging the work of other regulators who share the common objective of promoting financial stability. Bringing issues to the attention of other regulators can also lead to more effective combinations of prudential and business conduct tools or the review of the respective perimeters of regulation. When applicable, securities regulators can also call on self-regulatory organisations (SROs) to help mitigate areas of risk that they directly regulate.

Because systemic risk in today's markets transcends borders, international collaboration among regulators is also essential. Securities regulators should continue to collaborate through IOSCO to improve transparency and disclosure in various international securities markets, but they must also continue to be active participants in international supervisory colleges. The perspective of regulators from different sectors can help not only to identify risk, but also to better identify potential collateral consequences of proposed responses.

For example, the regulatory and supervisory framework for shadow banking currently being discussed at the FSB requires collaboration among regulators to define more precisely the potential sources of risks related to shadow banking across traditional perimeters of regulation.⁶⁶ The current view is that shadow banking is best defined along functional lines rather than by entity. The key components of shadow banking are credit creation and maturity and liquidity transformation occurring outside the banking system. Other important aspects may include the interplay between maturity transformation and leverage, which can substantially increase systemic risk, and the role of credit ratings, insurance and funding and liquidity provision by banks in facilitating some of the activities occurring within shadow banking. The possible outcomes will depend on the various forms of shadow banking considered, the extent of their role in maturity transformation, their growth prospects (e.g. impact of the new banking prudential framework), and the effectiveness of the various prudential and non-prudential tools considered. Securities regulators provide important perspectives on many of the forms of leverage credit and maturity transformation being discussed.

Regulators should also share the results of their respective monitoring and research on risk, especially when heightened cross-sectoral risks emerge. Domestic risk oversight boards will provide a forum for such information sharing in many jurisdictions. Internationally, a forum for such sharing of information might include IOSCO's proposed Standing Committee on Risk and Research as well as the FSB's Standing Committee on Assessment of

⁶⁵ In some cases, securities regulators' analysis may conflict with that of fellow agencies or they may have to persuade them of the significance of financial developments related to securities markets.

⁶⁶ "With regulatory requirements on the banking system tightening, we need to counter a likely resurgence of shadow banking. Assessing the need to apply regulatory safeguards to shadow banking will be a key priority of the FSB's reform agenda going forward." *FSB Letter to G-20 Leaders*, 12 November 2010, available at http://www.financialstabilityboard.org/press/pr_101111b.pdf.

Vulnerabilities. Timely communication of research findings is essential to developing an effective regulatory response, whether domestically or internationally.

A.2.2 Promoting Confidence through Communication about Risk

Securities regulators also have a unique role to play in promoting confidence in markets. While mandates as to investor protection vary across jurisdictions, all securities regulators have an interest in promoting confidence in capital markets. As discussed above, increased disclosure and transparency gives investors more of the information that they need to allocate capital away from risk or to require higher returns for riskier investments. Increased transparency may also give regulators important information about risks related to specific products, markets or participants. However, regulators would agree that even the most robust disclosure and transparency regime, while helping to alleviate asset mispricing, can never completely eliminate that mispricing and/or bubbles in securities markets that occur as part of the cyclical nature of financial markets. However, there are likely to be instances where - whether through monitoring, research, examinations or disclosures by individual registrants - securities regulators may also be able to recognize broader risks that have not yet been adequately disclosed to the market. Armed with such perspective, securities regulators should take steps to ensure that these risks are made transparent to other regulators and, where appropriate, to the market.

The objective of communication with other regulators is to learn and to raise awareness of potential vulnerabilities, facilitate a thorough discussion of collateral consequences, and develop coordinated policy responses. Communicating also creates an opportunity for regulators to present their views and analyses to others and be challenged. There may be times when regulators determine that it is appropriate to communicate concerns about systemic risk directly to the public, but because communication about macro-economic trends such as long-term pricing are traditionally within the purview of most central banks, securities regulators should coordinate closely with the central bank and other regulators to determine an appropriate communications strategy.

Through existing tools, securities regulators already play a role in communication with markets, and those tools can be useful in addressing emerging risk. In addition to direct communication with registrants to improve disclosure and enforcement actions relating to disclosure, securities regulators can publish studies and risk outlooks and conduct industry round-tables (perhaps via SROs, professional bodies and other industry groups) to raise awareness of and/or seek information about emerging concerns. While securities regulators should be careful about the content and form of their reports, some regulators may choose to publish risk assessments on an ad-hoc or regular basis.⁶⁷ This may assist the regulator in developing its risk approach and contribute to strong market discipline.

⁶⁷

Examples of such reports include FSA's Annual Risk Outlooks, AMF's Risks and Trends Mapping, published annually; CESR's Trends, Risks and Vulnerabilities in Financial Markets, first published in July 2010. Publishing efforts can be used to explain the priorities of regulators and support policy and regulatory actions undertaken; they may also feed into the analysis provided by other financial stability reports, such as the ones produced by central banks or international institutions (*e.g.* the IMF's semi-annual Global Financial Stability Reports).

A.3 New responses to Financial Innovation, Leverage and Pro-cyclicality

The above tools are already available to securities regulators but can be used with the objective of mitigating the build up of systemic risk. Regulators will also need to explore other tools and actions. Securities regulators will want to address the development of business models which rely on high levels of leverage and strong economic growth for their viability. Usually these models surface towards the end of a boom cycle, and combine financial innovation with easy credit. The dangers for the system arise from their vulnerability to changes in the economic environment and the adverse consequences for financial institutions and credit markets that result from high leverage.

A.3.1 Responding to financial innovation

Some of the causes of the financial crisis were associated with a range of financial innovations, such as CDOs, CDSs, SIVs and others, prompting debate about their benefits and complexity and how regulators should respond to those innovations. With respect to the risks attached to financial innovations, there are many aspects to consider: innovations have often the effect of transferring risks from one part of the system to the other, or increasing leverage or interconnections between market participants; furthermore, it is difficult to anticipate how some innovations may react to a shock, as well as how the ultimate allocation of risks in the system might evolve. Innovations can also take various forms, such as new products, new business models and entrants, new trading strategies and venues, and new technologies. Due to the interconnections among markets and participants, the effects of financial innovations can often resonate in various parts of the system and are not always a direct result of the size or importance of the innovation itself (e.g. CDS markets). Innovations and changes in the markets can also modify the relationships between different market segments and, potentially, increase the potential for contagion (e.g. the interactions between equities, derivatives and ETFs, as highlighted during the “flash crash” event). Lastly, in most cases, financial innovation creates challenges for supervisors and regulators who need to keep pace with the rapidly evolving marketplace.

A first range of response was to step up the requirements at the level of intermediaries regarding the governance and risk management for new products, for instance through product and risk committees. Regulators have also changed their approach to financial innovations, with greater consideration of the risks. Examples of innovations under the scrutiny of regulators include complex structured products, the growth of high frequency trading or the growth of complex leveraged ETFs. The newly established systemic risk bodies have also often been given the task to consider the impact of innovations on financial stability.

A new framework for financial innovation will therefore need to include:

- greater consideration of the risks attached to innovations at the level of financial institutions and regulators;
- close collaboration between supervisors and regulators to consider the various potential impacts of innovations and transfers of risks and the evolving interconnections between financial markets, institutions and products;

- implications for the resources of regulators needed to maintain the appropriate level of surveillance and control;
- consideration of the international dimension of financial innovation in order to prevent regulatory arbitrage.

A.3.2 Monitoring and tackling excessive leverage and concentration in the market

Securities regulators traditionally monitor firms and customers controlling or owning large positions in particular securities or derivatives. The goal is to prevent market manipulation but also to identify any risks relating to significant concentrations in the market (e.g. through counterparty risks). In Hong Kong for example, following the Asian Financial Crisis in 2008, statutory position limits have been imposed on most of the derivatives products traded on the exchange. In the United States, new legislation will allow the CFTC to impose position limits across different markets, including the energy and agricultural markets, and with respect to trading in certain OTC derivatives. In March 2009 the IOSCO Task Force on Commodity Futures Markets called on all futures market regulators and other relevant authorities to have access to information that permits them to identify concentrations of positions and the overall composition of the market, comparable to the authority which the CFTC already has. Reforms of the commodities markets are also expected in the European Union in 2011.

The enhanced supervisory framework for hedge funds will also track the potential for a hedge fund or group of funds to have systemic implications because of relative size or presence in a market.⁶⁸ In particular, IOSCO has developed a template to enable the collection and exchange of consistent and comparable data amongst regulators and other competent authorities for the purpose of facilitating international supervisory cooperation in identifying possible systemic risk in this sector.⁶⁹

The new supervisory framework for hedge funds will allow regulators to better monitor their leverage (through borrowing or from positions held in derivatives), as well as some other information such as the extent and nature of funding counterparty exposure. Regulators (or systemic risk bodies) will then have the information necessary to take actions to impose limits on leverage when the stability and integrity of financial markets may be weakened.

A.3.3 Pro-cyclicality and securities regulators' tools

Traditionally, discussions about the pro-cyclicality of the financial system have focused on the pro-cyclical effects of capital requirements. Other topics have since then been discussed, including the impact of accounting standards, the role of credit ratings and the impact of collateralisation practices. Regarding credit ratings, the “cliff effects” that can occur when credit ratings are downgraded amplify pro-cyclicality and can cause systemic disruption. From a securities regulation perspective, IOSCO’s efforts have been directed to developing a Code of Conduct containing measures to address concerns about the quality of credit ratings

⁶⁸ IOSCO released *Hedge Funds Oversight*, Report of the Technical Committee of IOSCO containing new regulatory requirements for hedge funds in September 2009, available at <http://www.iosco.org/news/pdf/IOSCONEWS166.pdf>.

⁶⁹ *International regulators publish systemic risk data requirements for hedge funds*, Press Release, IOSCO, 25 February 2010, available at <http://www.iosco.org/news/pdf/IOSCONEWS179.pdf>.

and the conflicts of interest in agencies' business models.⁷⁰ The Code of Conduct has since been endorsed by the G-20 as the basis for regulation of credit rating agencies globally. In addition, the FSB has made recommendations for regulators, central banks and private market participants to reduce mechanistic reliance on credit ratings, which can give rise to “cliff effects”.⁷¹ The full implementation of these measures would significantly improve the quality of ratings and therefore help to address potential pro-cyclical effects. Regarding accounting rules, standards with respect to impairment of assets are currently being reviewed by the International Accounting Standards Board; this work could contribute to address some of the pro-cyclical aspects of accounting rules while improving transparency and usefulness of financial statements for users. Lastly, more work needs to take place with respect to collateral practices and potential pro-cyclical effects.⁷²

A.4 Reviews of the perimeter of securities regulation

Consistent with new IOSCO Principle 7, securities regulators should periodically review, among other activities, the regulatory coverage of financing activities to ensure that none are escaping appropriate regulation. Examples might include:

- the rapid growth of new – and unregulated – financing activities;
- the rapid growth of financing activities that have previously been lightly regulated, or exempted from supervision by the securities regulator;
- the conduct of activities by banks in the securities markets and that customers consider are ‘safe as a bank’ because they are being undertaken by a bank; and
- the transfer of activities from the banking or insurance sectors to unregulated entities or to entities within the securities sector, as prudential regulatory requirements increase.

This task will require securities regulators to:

- regularly survey activity in financial and securities markets, so as to understand developments and the potential for regulatory arbitrage, and identify opportunities for cooperation and possibly changes;
- set internal thresholds for intervening in new and expanding markets and activities; and
- set regulatory goals for intervention, so that they can evaluate whether intervention has been appropriate or needs to be modified.

⁷⁰ *Code of Conduct Fundamentals for Credit Rating Agencies*, Technical Committee of IOSCO, May 2008, available at <http://www.iosco.org/library/pubdocs/pdf/IOSCOPD271.pdf>.

⁷¹ *Report on Principles for Reducing Reliance on CRA Ratings*, Financial Stability Board, 27 October 2010, http://www.financialstabilityboard.org/publications/r_101027.pdf. The European Commission has also launched a new consultation to re-examine certain aspects of the current regulatory framework. In particular, the Commission notes that there are growing concerns that financial institutions and institutional investors may be relying too much on external ratings and do not carry out sufficient internal credit risk assessments, which may lead to volatile markets and instability of the financial system, http://ec.europa.eu/internal_market/securities/agencies/index_en.htm.

⁷² See for instance, *The role of margin requirements and haircuts in pro-cyclicality*, Committee on the Global Financial System, March 2010, available at <http://www.bis.org/publ/cgfs36.pdf>.

An important area for review will be banking-like financial activities, which securities regulators may find within their perimeter, often called ‘shadow banking’. Some examples of shadow banking may include money market funds, securities lending against cash collateral (where the cash is effectively callable and reinvested in longer-maturity assets), borrowing through the overnight or short-term repo market and using the proceeds to invest into long-term assets, ABCP conduits if issuing short-term liabilities (e.g. short-term CP), SIVs and finance companies (if issuing short-term liabilities), and possibly some types of hedge funds, such as credit hedge funds. The above list reflects some of the current legal structures and entity types which were involved in the recent financial crisis (i.e. SIVs). As future structures may change, the use of a functional definition of shadow banking will become increasingly important

In circumstances where shadow banking activity is occurring, a decision should be made jointly with the prudential regulator whether the securities regulator should consider, amongst other possibilities:

- whether to monitor and engage with other regulatory agencies and, if systemic risks are deemed low, refrain from taking any action;
- monitoring and regulating indirectly, via impacting on points of interaction between shadow banking entities and areas where tighter regulations and controls already exist;
- developing the capacity to apply regulation similar to that of prudential regulators;
- seeking to modify certain characteristics of such products to make them less like “banking” products;
- strengthening disclosures and transparency, so that market participants have a better understanding of the extent of maturity and liquidity transformation within products.; or
- shifting the regulatory responsibility for those banking-like activities to the prudential regulator.

The decision should be made according to the nature of the product and who is best suited and able to provide the appropriate regulation, rather than on the lines of traditional supervisory oversight. In this way, the risk of a major build-up of systemic risk will be reduced.

Figure C sets out for illustration some examples of possible forms of systemic risk and the indicators and actions available to securities regulators to address them.

Figure C: Examples Of Possible Systemic Risks And Actions Available To Securities Regulators To Address Them

This figure suggests some types of systemic risks that might arise and the tools that securities regulators might use to address them. The intent is to invite discussion on these issues.

Type of Systemic Risk	Indicators	Examples of tools that could be used
1. Major market imbalance		
For example: <ul style="list-style-type: none"> • The market appears on historical trends to be substantially mispriced • Competitive pressure driving margins to very low levels 	For example: <ul style="list-style-type: none"> • Market as a whole is more than significantly above a long term average • Strong inflows into an asset class • Levels of leverage are at historical highs • Underwriting standards falling 	<ul style="list-style-type: none"> • Coordinate analysis and actions with other regulators • Raise public awareness of heightened risks in the market as appropriate • Review prudential requirements to ensure that they are consistent with the level of risks in particular markets/products • Emphasise disclosure and suitability (where appropriate) in supervision of financial advisors
2. Systemically important entity subject to securities regulators' remit		
For example: <ul style="list-style-type: none"> • A significant player with a significant footprint • A global investment bank 	For example: <ul style="list-style-type: none"> • Analysis of particular entity/ entities and discussions with other regulators reveals a concentration of risky assets on the balance sheet of a fund which has borrowed heavily from a number of SIFIs. 	<ul style="list-style-type: none"> • Improve cross border supervision through e.g. multilateral information exchange arrangement and/ or supervisory college • Require board of entity to report to regulator on risk management of counterparty exposures and other risks, and share report with prudential regulators • Consider making such reports public to enhance disclosure • Analyse counterparty exposures, with particular reference to retail investors (including pension funds) • Coordinate with prudential regulator on exposures of regulated entities

		<ul style="list-style-type: none"> • More regular and intense inspection of entity • Analyse market segments in which the entity is significant, with particular regard to substitutability • Increase loss absorbency capacity through higher capital requirements
<p>3. Significant product in securities regulators' remit with regulatory arbitrage concerns or significant maturity mismatch</p>		
<p>For example:</p> <ul style="list-style-type: none"> • A significant product develops promising short redemption period but underpinned by long term assets, e.g. REITs • Marketing of complex structured products / leveraged ETFs to retail investors 	<p>For example:</p> <ul style="list-style-type: none"> • Data reveals that SIFIs have created SIVs exposed to significant liquidity risks and rapid growth of assets or new structured products created from innovative but high-risk financial products • Surveys of investor sentiment and motivations in buying particular product 	<ul style="list-style-type: none"> • Raise or impose product disclosure requirements with a particular emphasis on risk • Revisit distribution channels to retail investors • Analyze distribution agent conduct with emphasis on suitability, and take measures to address inappropriate incentives • Address liquidity mismatch through e.g. requiring listing or increasing liquidity requirements • Alert fellow regulators and other policy-makers about regulatory gaps that should be addressed

B. IOSCO's Role

IOSCO is the global standard setter for the securities markets. As standard setter it has a role to play in providing guidance on measures to mitigate systemic risk. The standards it sets are intended to be implemented by all member jurisdictions in their local laws and rules. IOSCO has recently revised its Objectives and Principles to include two principles specifically directed to monitoring and reducing systemic risk, as described in Chapter 1. This part of the paper reflects the initial response of IOSCO on the tools that it might use or further develop in mitigating systemic risks. As these tools develop, it will become clearer the extent to which their use may mitigate systemic risk. As a conclusion to this part B, IOSCO's initiatives in standard setting intended to help reduce systemic risk since the financial crisis is discussed in Figure D.

B.1 Policy and Research

IOSCO has a role to play in providing guidance and developing policies and standards on when and how the regulatory tools described in Part A of this chapter should be used. The development of this guidance will encourage consistency and co-operation among securities regulators in addressing systemic risk. For example, the *Principles of Supervisory Co-operation* provide guidance on a range of areas, including the way regulators can co-operate in identifying and assessing risks, including systemic risks.

The first commitment of IOSCO is to build a research capacity that will focus its initial efforts on researching systemic risk. Some activities have already begun with a small Research Unit being established at the General Secretariat. A new Standing Committee on risk and research has been formed, composed of experts from securities regulators from the most important markets. This Standing Committee will discuss and initiate research activities. In addition IOSCO has decided to create an independent Research Department at the General Secretariat which is intended to replace its existing Research Unit, scheduled to be operative from the start of 2012.

The Research Department will prepare an Annual *Global Securities Regulation Risk Outlook*, which aims to identify the most important systemic risks for securities regulation at a global level. This will require elaborating the list of indicators in Appendix A, and then assessing the extent of systemic risk across many jurisdictions

A second type of risk analysis is exploratory analysis that focuses on risks in specific products, market segments or technologies. By publishing reports, IOSCO intends to initiate discussions on major risks to the securities industry in order to raise the understanding thereof. The Research Department will also establish a network of external experts, composed of market practitioners, industry organizations and academia. This network can be a source from which IOSCO can gather qualitative information on systemic risk arising in the financial markets.

IOSCO considers that its particular contribution should be in analysing systemic risk from a securities market perspective. Market regulators are uniquely placed to understand risks emerging within or through the markets as a system, rather than as a collection of institutions. As securities markets are globally interconnected, IOSCO has a special role to play in analysing systemic risk that emerges through the interconnection of global markets. However, in order to achieve this goal, significant expertise and resources will need to be

added to the Research Department. Furthermore, to be effective it will have to maintain its independence to be credible and achieve its purpose.

B.2 Collaboration and Cooperation

Cooperation and collaboration on a global level is one of reasons for the existence of IOSCO. IOSCO has taken the lead and has been instrumental in setting up the Multilateral Memorandum of Understanding (MMOU) that deals with cooperation, collaboration and information sharing for enforcement purposes between securities regulators. Using this model, one option for IOSCO to help research and standard setting work related to systemic risk is to encourage members to enter into bilateral Memoranda of Understanding (MoU) or negotiate multilateral MoU's to address additional fields of cooperation, especially sharing data and coordinating action on risks.

An additional step taken by IOSCO is to engage the SROs that are members of IOSCO through the Self Regulatory Organization Consultative Committee (SROCC) on specific risk topics. As these SROs are one step closer to markets than their supervisory authorities, it would make sense to use their information, data and expertise to help the research function, as well as to disseminate IOSCO messages or standards. IOSCO and its SROCC have already started the engagement process where several discussions have already taken place. The IOSCO Research Unit will be in consultation with the SROCC to identify possible areas of collaboration in the future.

Another avenue for IOSCO to explore to mitigate risk and promote financial stability is through regular stakeholder consultation. In these consultation meetings, IOSCO policy makers discuss their work program with representatives of major industry organizations. These meetings are held on a regular basis and provide an excellent opportunity to exchange information about the build up of systemic risk. Their views can play an important role in developing IOSCO's annual *Global Securities Regulation Risk Outlook*.

IOSCO is also considering organizing an intensive dialogue with relevant top level industry groups to discuss important systemic risks in a manner similar to the Senior Supervisors Group⁷³. This Group, from 2005 onwards, made a step by step improvement in trading and clearing of the OTC derivatives market in an intensive dialogue with the largest banks.

On certain topics, IOSCO needs to work closely together with other global bodies, like the G-20, FSB, BCBS, CPPS, IAIS, ESRB, IMF, World Bank and, where appropriate, reach out to domestic bodies through IOSCO members. On more complex and broader risk areas with cross-sectional implications, these global bodies can offer their expertise and experience in coming up with solutions to mitigate such risks. The collaborative research will give IOSCO a credible voice to work with these for a. The current standard-developing process of CPSS-IOSCO is a good example that focuses on the complexities of global financial markets infrastructures. The Basel Committee has been invited to contribute in this process and to coordinate with the recent Basel III framework. Another important role here is the work of the Joint Forum, made up of the Basel Committee, IAIS and IOSCO, that focuses especially

⁷³ The senior supervisory group is composed of five countries and their respective regulatory agencies, namely the French Banking Commission, the German Federal Financial Supervisory Authority, the Swiss Federal Banking Commission, the U.K. Financial Services Authority, and, in the United States, the Office of the Comptroller of the Currency, the Securities and Exchange Commission, and the Federal Reserve.

on cross-sectoral issues.

A new area of activity that could be within the realm of IOSCO's global work could be improvement to transparency and disclosure through setting standards for the collection of data and standardizing documentation relevant to systemic risk. Further work on this topic will have to be developed to clarify and assess the feasibility of such functions given the costly nature of such an exercise.

B.3 Communication

By increasing awareness through developing IOSCO's outreach programs, website, training and education programmes and other means, IOSCO can better prepare members, industry participants, politicians and other global bodies to take steps to mitigate systemic risk emanating from or passing through the securities markets. IOSCO's annual publications such as the *Global Securities Regulation Risk Outlook* and *Exploratory Analyses* will also aid this process. Another option would be to develop an information exchange website through the IOSCO portal.

IOSCO can seek to directly influence the global debate on systemic risk by engaging in dialogue with the G-20. IOSCO has been actively engaged with the G-20 and other global bodies and standard setters throughout the crisis, and that level of engagement should continue or increase. When IOSCO offers its expertise and shares its viewpoint on important topics, dialogue occurs and work is more likely to be undertaken jointly to ensure securities regulators are involved.

B.4 Stabilisation Tools

IOSCO can contribute indirectly to stabilisation through its international coordination and outreach functions. Although not in a position to directly address issues such as pro-cyclicality, it can provide guidance and best practices on how to address issues of systemic risk at a national or global level.

Figure D: IOSCO's Initiatives since the Financial Crisis

IOSCO has led (alone or jointly with other standard setters) a number of initiatives to address significant failures identified with the financial crisis. These significant reforms, and other work recently undertaken, illustrate how securities regulation can contribute to reduce sources of risks in the system and help the monitoring of risks.

- *Regulating and monitoring market participants:* IOSCO has published high level principles for the regulation of hedge funds (including registration, and principles on appropriate on-going regulatory requirements) (June 2009). These principles were later followed by the release of a template for the global collection of hedge fund information which will assist in assessing possible sources of systemic risk arising from the sector (February 2010). IOSCO has also developed principles to guard better the integrity of the rating process and ensure that credit rating agencies are subject to appropriate supervision (March 2009). Additionally, IOSCO has reviewed due diligence for investors investing in structured products (July 2009) as well as internal controls in place at intermediaries associated with price verification of structured products (August 2010); this report also discussed regulatory approaches to liquidity risk management; further work on liquidity

risk is now taking place in Standing Committee 5 (Asset Management) of IOSCO.

- *Promoting transparency and soundness in the markets:* IOSCO supports the reforms of the OTC markets. Given the central role given to central clearing counterparties and trade repositories, the work currently conducted by CPSS-IOSCO will ensure that the level of standards applying to those entities will be sufficiently robust. The FSB has also asked IOSCO to lead the reflections on exchange trading of OTC derivatives, reporting and aggregation requirements. IOSCO's TFUMP report has also recognised the gaps in the regulation and supervision of the securitisation and CDS markets, and recommends (among other things) enhanced investor transparency, better alignment of interests between originators/sponsors of securitised products and investors, more accurate and timely market data, and improved risk management. In addition, IOSCO has set up a Task Force on commodities markets.
- *Monitoring trading practices:* IOSCO has established a Task Force on Short Selling and issued high level principles for the effective regulation of short selling (June 2009), including the need to establish appropriate controls in order to reduce or minimise the potential risks to the orderly and efficient functioning and stability of markets.
- *Limiting risks from innovations and other changes in the market:* IOSCO has published Principles on Direct Electronic Access to Markets which are based on the recognition that markets, intermediaries and regulators must each play a role in addressing the potential risks posed by DEA (August 2010). IOSCO has published a consultation document relating to the growth and impact of dark pools (October 2010) and is currently working on potential risks relating to the development of high-frequency trading (HFT) as well as the growth of exchange-traded funds (ETFs).
- *Improving cooperation between regulators:* IOSCO has worked to enhance cross-border supervisory cooperation and information sharing among regulators through discussions, memoranda of understanding, supervisory colleges and networks of regulators (May 2010).
- *Preventing regulatory loopholes and favouring cross-sectoral cooperation:* IOSCO was part of the Joint Forum's Task Force on Differentiated Nature and Scope of Regulation (January 2010) and contributed, again with the two other standard setters, to the review of the treatment of Special Purpose Entities

Chapter 5 Conclusion

Securities regulators have a key role to play in identifying and mitigating systemic risk. Incorporating a greater emphasis on reducing systemic risk into their everyday tasks and processes will have significant implications for the way securities regulators perceive their role. It will also impact the way they define their responsibilities, communicate with market participants and cooperate with other regulatory and supervisory authorities sharing systemic risk responsibilities. Their market knowledge gives securities regulators a unique and useful perspective in identifying, analyzing, monitoring and mitigating systemic risk building up in the financial system.

Securities regulators recognize that they share responsibility for dealing with systemic risk with central banks and prudential regulators, which have traditionally been the focal point for stability of the overall financial system. Consequently, IOSCO and securities regulators look to work with central banks and prudential regulators in developing their approach with respect to systemic risk and contributing to financial stability. At the global level, cooperation between regulators and supervisors through bodies such as the FSB, the Basel Committee and IOSCO is essential to promote the sharing of information and the combination of expertise and coordination of actions. In addition, the global and interconnected nature of modern financial markets makes it even more important that securities regulators, along with IOSCO, play a key role in addressing systemic risk.

To better define the role and contribution of securities regulators in this respect, IOSCO has established two new principles of securities regulation: that securities regulators have or contribute to a process to monitor, mitigate and manage systemic risk appropriate to their mandate; and that securities regulators have or contribute to a process to regularly review the perimeter of regulation. This Discussion Paper builds on those principles and initiates a process of developing a methodology for the identification, analysis, monitoring and mitigation of systemic risk as well as the promotion of financial system stability. IOSCO has established a research function to focus on emerging sources of systemic risk and produce a *Global Securities Regulation Risk Outlook*, building on and complementing the work of bodies such as the IMF.

IOSCO will continue to discuss and develop its views on key risk measurements and ways to mitigate systemic risk, building on this analysis. This paper highlights the following preliminary findings:

1. Disclosure and transparency are critical to identifying the development of systemic risk and to arming regulators with the information needed to take action to address it. Transparency in markets and products is crucial to understanding and mitigating systemic risk, in addition to allowing market participants to better price risk. Securities regulators have a particular responsibility and interest in promoting transparency at the market level as well as adequate disclosure at the product and market participant level.
2. Robust regulatory supervision of business conduct is essential to managing conflicts of interest and the build-up of undesirable incentive structures within the financial system. Without it, incentives can quickly become distorted with drastic consequences such as increased leverage and risk in the system. With it, investor confidence is likely to provide greater stability to the market.

3. Financial innovation and its implications for financial stability should be a focus for securities regulators. Innovation should be encouraged and facilitated where it has the potential to improve the efficiency of the markets or to bring useful products and new participants to the market. Innovation which involves opacity or improper risk management should be carefully monitored.
4. Given the central role of markets in the overall financial system and their capability to generate and/or transmit risks, securities regulators should work with other supervisors to improve the overall understanding of the economics of the securities markets, their vulnerabilities and the interconnections with the broader financial sector and the real economy. Sharing of market information and knowledge, will be essential to deliver a truly efficient regulatory response to systemic risk.
5. It is important for securities regulators to develop key risk measurements relevant to systemic risk arising within securities markets, and improve their understanding and application of tangible steps to mitigate identified systemic risk.

The above findings form the foundation of robust and effective systemic risk frameworks for securities regulators. The development of processes to address systemic risk is an evolving field for securities regulators which will require ongoing research. It will also be important for IOSCO to continue to engage its members in the development of systemic risk frameworks.

Appendix A: Possible Indicators Relevant To Systemic Risk

Micro level indicators

Securities regulators should monitor micro-level developments to gauge problems as arising from knowledge gaps, regulatory gaps, and the extent of transparency. Indicators for these problems include:

- rapid developments in market segments;
- growth of particular participants;
- concentrations of positions in certain market segments;
- opacity of primary and secondary markets;
- inadequate or overly-complex disclosure;
- heavy reliance on risk modelling or credit ratings, especially for risk management of new products;
- rapid advances in technology; and
- changes in market structure.

Potential indicators related to specific sources of Systemic Risk in the securities markets

Regulators may also want to monitor more specific micro-level indicators related directly to the identified sources of systemic risk. The following is a list of potential indicators which can help securities regulators identify systemic risks. Most often, it is a combination of these indicators which can reflect the potential for systemic risk.

a) Size

- Individual market size (relative, absolute and the rate of growth):
 - i. debt markets
 - ii. equity markets
 - iii. derivatives markets
 - iv. Others.
- Products (relative, absolute and the rate of growth)
 - i. Investor base
 - ii. Funding base/dependency

- Market participants and key gatekeepers (relative, absolute and the rate of growth)
 - i. Issuers
 - ii. Intermediaries (especially those considered systemically important or too-big-to-fail)
 - iii. Institutional investors
 - iv. CRAs, auditors and etc.
- Market activities
 - i. Short selling (volume, positions outstanding, especially net short positions)
 - ii. Securities lending (amount on loan)
 - iii. High-frequency or algorithmic trading (share of turnover, share of orders)

b) Interconnectedness

- Counterparty exposure information collected from participants
- Levels of cross border exposures and dependencies
- Measures of correlation between markets, products and institutions
- Degrees of leverage on balance sheets
- Ownership of assets (a measure of exposure to price falls)
- Liquidity (different measurements)
 - i. Institution based
 - ii. Market based (i.e. spreads)
- CCP data
- Trade repositories

c) Substitutability and Concentration

- Participant market shares in various segments
- Scale of Exposure to individual assets, markets and institutions

- Data about the size of positions held (e.g. trader commitment data collected by the CFTC)
- Measures of market concentration and competition such as the Herfindhal-Hirschman Index (HHI)⁷⁴
- Qualitative assessments of the availability of alternatives/substitutes

d) Lack of Transparency and Knowledge Gaps

- Review of potential knowledge gap regarding market activity
 - i. Short selling
 - ii. Alternative investment funds
 - iii. Debt and derivatives markets
 - iv. OTC markets in general
- Proportion of activity on non-transparent markets
 - i. Dark pools/Internalization/Dark liquidity in general
 - ii. Non-exchange traded derivatives transactions
- Proportion of exempt market transactions
- Continuous disclosure review outcomes
- Measures of investor education/literacy
- Level of failed settlements
- Differences in settlement regimes between national jurisdictions

e) Leverage

- Institutions balance sheets
- Margin lending levels and haircuts (e.g. for repos)
- Leverage levels of funds
- Trends in product leverage

⁷⁴ The Herfindhal- Hirschman Index (HHI) is a commonly accepted measure of market concentration <http://www.justice.gov/atr/public/testimony/hhi.htm>.

- Size of derivatives market(s)
- f) Behavioural Issues
- Trends in remuneration practices
 - Trends in selling practices
 - i. Surveys/Outcomes from *mystery shopper* tests
 - ii. Regulators' compliance data
 - Leveraged capital gains investing
 - Herding/flow of funds
 - Changes in investment strategy
- g) Regulatory Gaps
- Proportion of unregulated transactions
 - Existence of under-regulated areas of markets (e.g. shadow banking)
 - Evidence of regulatory or supervisory arbitrage
 - Shared jurisdiction.

Indicators of risk transmission

- network analysis of counterparty exposures
- measures of changes in market liquidity and funding liquidity
- monitoring correlation between firms, markets, and asset classes
- monitoring situations that appear to be tightly coupled
- monitoring surveys of investor confidence

Macro level indicators

Securities regulators may also find it useful to maintain an awareness of macro-level indicators of conditions relevant to the securities markets, including how they could impact the behaviour of market participants and investors. Macro factors can also have a link with micro-level business models, which, for example, require uninterrupted access to short-term funding and, as a result, are highly vulnerable 'when the music stops'. The indicators that securities regulators may want to monitor include, but are not limited to:

- Macro economic data (e.g. interest rates, inflation, economic growth rates, flow of funds, changes in the money supply and credit growth, asset purchase programs by central banks, interbank lending);
- Fiscal debt sustainability – sovereign debt and overall indebtedness of market participants, issuers or individuals in aggregate;
- Indicators of deviations from long-term value of assets (e.g. Tobin's Q, Shiller's CAPE⁷⁵);
- Asset prices and spreads (e.g. credit spreads, equity markets, commodity markets)
- Movement of international capital flows;
- The geopolitical environment; and
- Systemic risk indicators developed by other organizations (e.g. IMF, ECB, BIS, and FSB).

⁷⁵ Developed by Yale Professor Robert Shiller, Cyclically Adjusted Price to Earnings ratio (CAPE).

Appendix B – List of Task Force Members

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