



# TC NOTES

PRACTICAL **LEADERSHIP**  
AND **GUIDANCE** FROM  
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# INTEGRATING MICROPRUDENTIAL SUPERVISION WITH MACROPRUDENTIAL POLICY

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# INTEGRATING MICROPRUDENTIAL SUPERVISION WITH MACROPRUDENTIAL POLICY

## TABLE OF CONTENTS

Introduction.....	2
What is the macroprudential approach and how does it differ from the microprudential approach to supervision? .....	2
The sum of microprudential risk is less than systemic risk because of externalities ....	3
Why should supervisors be concerned about systemic risk?.....	4
Main elements of the macroprudential approach to oversight of financial systems .....	8
Processes for identifying vulnerability to systemic risk .....	8
Macroprudential approach to mitigate systemic risk .....	10
Macroprudential tools.....	12
Coordination among agencies in identifying and mitigating systemic risk.....	15
Implications of the macroprudential approach for microprudential supervision.....	16
Revisions to supervisory core principles.....	16
Practical considerations in integrating the micro and macroprudential approaches ....	19
Implications for the supervisory processes.....	20
Conclusions .....	22
References .....	24
Appendix: Modifications of the Basel Core Principles to reflect macroprudential considerations .....	27

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# INTEGRATING MICROPRUDENTIAL SUPERVISION WITH MACROPRUDENTIAL POLICY

## Introduction<sup>1</sup>

The purpose of this Toronto Centre Note is to explain why the macro and microprudential approaches and disciplines have to be integrated for the effective oversight of individual institutions and the financial system as a whole. It explains why the microprudential authority will need to be deeply involved in the macroprudential approach and how the macroprudential approach modifies the approach to microprudential supervision. It outlines a framework for integrating microprudential supervision with macroprudential policy.

The Note is intended to provide an overview, explaining the key issues and why they are important. It does not address in detail either macro or microprudential policies. As discussed in their respective supervisory core principles (CPs), the microprudential objectives for banking, insurance, and securities differ. The objectives of banking supervision are to protect the safety and soundness of the banks and the banking system; the objectives of insurance supervision are to protect policyholders and to contribute to the stability of the financial system; and the objectives of securities supervision are to protect investors, to ensure that markets are fair, efficient, and transparent, and to reduce systemic risk. While each supervisory approach has unique aspects, they have all evolved to have the common objective to reduce systemic risk. This is the primary objective of macroprudential policy. This Note discusses how to integrate these common micro and macroprudential objectives; it does not address the unique aspects of supervision in each of the sectors.

The Note explains what the macroprudential approach is and how it differs from traditional microprudential supervision; the main elements of a macroprudential approach to the oversight of financial systems; the implications of the macroprudential approach for microprudential supervision; and a framework for the integration of the approaches.

## What is the macroprudential approach and how does it differ from the microprudential approach to supervision?

Microprudential supervision generally focuses on the **safety and soundness of individual financial institutions**. It has evolved from the objective of protecting depositors, investors, and policyholders from the risk of failure of financial firms.<sup>2</sup> Traditionally, microprudential supervision achieves its objectives by identifying the various inherent risks involved in financial intermediation and adopting policies and procedures to mitigate these risks, including reviewing how well these risks are governed and the adequacy of resources to support the risks. The

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<sup>1</sup> This Toronto Centre Note was prepared by R. Barry Johnston. The comments of Clive Briault are gratefully acknowledged.

<sup>2</sup> As discussed in this Note, the approach to supervision has evolved to place more emphasis on system-wide concerns.

inherent risks include credit, liquidity, market, counterparty, underwriting, operational, and financial crime. The microprudential approach designs and adopts policies that are intended to mitigate the inherent risks. The policies include assessing compliance with detailed standards and financial rules and regulations, on- and off-site supervision, and risk-based supervisory techniques.

The macroprudential approach focuses on the ***safety and soundness of the financial system as a whole***. It has evolved with the objective of identifying and mitigating ***systemic risk***.

Systemic risk is defined as involving two elements:

- An impairment or disruption to the flow of financial services; and
- That impairment would have the potential to have a serious negative impact on the real economy.<sup>3</sup>

The sources of disruption to the flow of financial services could originate from failures in financial institutions, markets, or instruments. It might be due to failures of banks, insurers, major market participants, or central counterparties; or it may result from the dislocation in a major funding market such as the bond, money, or derivative markets.<sup>4</sup>

Systemic risk involves the risk that the financial failure has a significant negative impact on the real economy. Thus, the failure of an individual financial firm, market, or instrument would only be of systemic concern if it had a significant negative impact on the real economy.

Herein lies a difference between the micro and macroprudential approaches. The microprudential approach focuses on the soundness of individual financial institutions, markets, or instruments; the macroprudential approach focuses on the soundness of the financial system as a whole and the implications of failures for the real economy. As explained below, modifications to the international supervisory standards following the global financial crisis (GFC) have narrowed the difference by increasing the attention paid by microprudential supervisors to systemic risk.

## **The sum of microprudential risk is less than systemic risk because of externalities**

The sum of microprudential risk is less than systemic risk because of externalities. Externalities are factors that are generally not taken into account in the inherent risks and can have an impact on the stability of the financial system and potentially the real economy. An example of an externality is where the failure of a financial firm (A) has serious secondary repercussions on other financial firms, such as causing another financial firm (B) to fail. The microprudential approach, by focusing on the inherent risks on firm A's own balance sheet, would not take account of the additional risk posed by the knock-on effects causing firm B to fail. The

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<sup>3</sup> International Monetary Fund et al. (2009).

<sup>4</sup> This definition does not distinguish the source of the impairment to the financial institutions, instruments, or markets – this could be internal to the financial institution (for example, failure due to fraud), or external (for example, the impact of a pandemic). The critical consideration is whether the disruption in the financial institution, market, or instruments has a serious impact on the real economy.

microprudential approach would underestimate the risks posed to the financial system as a whole by firm A.<sup>5</sup>

Assume that the microprudential authorities were able to identify all sources of inherent *net* risk in financial institutions markets or instruments. Net risk is understood as the residual risk after taking into consideration the risk mitigation policies. Designate these net micro risks as Micro(i). The sum of all the net micro risks,  $\sum \text{Micro}(i)$ , would be less than the macro risk, designated by Macro, by a factor  $\alpha$ :

$$\text{Macro} = \sum \text{Micro}(i) + \alpha$$

The additional risk factor ( $\alpha$ ) is due to the externalities. The knock-on effect discussed above would be captured in the macroprudential approach by including the risk in the factor  $\alpha$ . As discussed further below, some of the main sources of externalities that are of concern in macroprudential assessments are associated with interconnectedness between financial institutions, and procyclicality due to feedback loops between the financial and real sectors.

## Why should supervisors be concerned about systemic risk?

The maximization of social and economic welfare is generally accepted as one of the key aims of government policies and provides an objective basis with which to assess different policies and to allocate scarce government resources. The social welfare benefits of microprudential supervision are generally associated with its role in addressing market failures that interfere with the capacity of financial institutions and markets to police themselves.<sup>6</sup> The social welfare objectives of macroprudential policy are broader. By focusing on systemic risk – the impact of financial systems and failures on the real economy – macroprudential policy is closely aligned with societies' broader welfare objectives.

From the point of view of maximizing social and economic welfare, the microprudential focus on individual institutions and markets has shortcomings:

1. **Failure to prevent financial crises** – financial crises have serious negative effects on economic performance and are associated with sharp declines in economic growth, increasing unemployment, inequality, and poverty.<sup>7</sup>
2. **Moral hazard** – moral hazard arises when agents are not fully responsible for the risks associated with their own decision making. Moral hazard has a negative impact on the financial system and its contribution to economic growth and development.
3. **Unregulated activity and silos** – regulation design based on financial institutions' legal forms (bank, insurer, securities firm) rather than their intermediation functions

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<sup>5</sup> To illustrate further the difference, a microprudential approach would take account of market conditions in supervising liquidity and funding on the balance sheet of the individual financial institution. The macroprudential approach would *in addition* consider the impact of the financial institution's failure on market conditions and other financial institutions. The latter consideration is the externality.

<sup>6</sup> The failures include anti-competitive behavior, market misconduct, and asymmetric information. The problem of asymmetric information is discussed further below and serves as the primary justification for prudential regulation (World Bank 2013). Santos (2000) discusses the sources of the market failures.

<sup>7</sup> See for example Reinhart and Rogoff (2011).

creates the risk of unregulated activity as intermediation falls either between the regulatory cracks or outside the legal frameworks.

4. **Constraints due to regulatory resources and potential regulatory capture** – supervisory resources are stressed by the complexity of financial institutions, instruments, and regulatory rules. The independence of supervisors may be compromised.<sup>8</sup>

The following elaborates on the failures to prevent financial crises and the sources of moral hazard.

### **Failure to prevent financial crises**

The failure of the microprudential approach to prevent financial crises is perhaps most clearly illustrated by the GFC of 2008.<sup>9</sup> The GFC stands out from other financial crises (Asia, 1997; Latin America, 1980s) in that it occurred in western economies that were implementing a sophisticated and internationally endorsed framework for microprudential supervision as reflected in international rules and regulatory standards.<sup>10</sup>

Prior to the GFC, the microprudential assessments were generally benign: international banks were considered to be sound and well capitalized, and financial markets were assessed to be functioning well with ample liquidity. There were warning signs of the build-up of excessive risks, such as the compression of risk premiums and the rapid growth of housing finance, but these were considered to be within the stress limits of the institutions to absorb the risks.

The crisis of 2008 materialized, first of all, in financial institutions that were weakly regulated.<sup>11</sup> Second, the failures of some of these financial firms had major secondary, and largely unanticipated effects on critical markets, which ceased to function, and the solvency and liquidity of other financial institutions including commercial banks and insurers. Third, the underlying capital and liquidity buffers that had been considered ample were found to be wholly inadequate. Fourth, the feedback effects from financial institution failures on depressing the real economy were severe and created negative feedback loops. The depression in the real economy resulted in further loan delinquency, with further adverse effects on the financial system, creating a downward spiral in economic activity and financial sector failure.

The microprudential approach underestimated the build-up of risk and overestimated the capacity of financial institutions to handle the risks. In particular, the microprudential approach did not take sufficient account of:

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<sup>8</sup> The independence of supervisors may be especially challenging in the context of the supervision of state-owned financial institutions, although it is certainly not limited to these situations.

<sup>9</sup> Diagnostics of the failures leading to the GFC and recommendations for fixing them are discussed in *The Squam Lake Report* (French et al. 2010) and Turner (2009).

<sup>10</sup> Those developed by the Basel Committee for banking, the International Association of Insurance Supervisors (IAIS) for insurance, and the International Organization of Securities Commissions (IOSCO) for securities.

<sup>11</sup> Lehman Brothers, which failed on September 16, 2008, was a major US-based investment firm, and while it was regulated by the US Securities and Exchange Commission (SEC) to comply with securities regulation, in practice there was limited regulatory oversight. See Bernanke (2010).

- **Risks outside the regulatory perimeter:** the build-up of risk exposures in unregulated/weakly regulated sectors;
- **The risk of contagion** from the impact of a failure of a financial institution or markets on other financial institutions and markets; and
- **The negative feedback loops** from failures in financial institutions and markets on real economic activity in amplifying the magnitude of the financial institution failures.

The microprudential approach overestimated the capacity of institutions to handle the risks by relying on:

- **Compliance with international standards** as the yard stick for the assessment of financial institution soundness (the standards at the time were flawed in various ways and did not recognize the sources of systemic risk);<sup>12</sup>
- **The assumption that markets would correctly price risk** as reflected in the balance sheets and in the capital standards of supervised financial institutions;<sup>13</sup> and
- **An expectation that financial institutions would police themselves** in mitigating risk when incentive structures were often not aligned with effective risk mitigation.

The failures were not limited to the microprudential supervisors. Authorities responsible for financial stability assessments also failed to recognize the systemic risks for reasons similar to those outlined above.<sup>14</sup>

### Microprudential supervision as a source of moral hazard

Microprudential regulation and supervision is generally developed based on a view that it can improve economic welfare by providing monitoring functions that dispersed counterparts (depositors, policyholders, bondholders and shareholders) are unable or unwilling to perform. However, this monitoring function also inherently poses a moral hazard risk.

First, the monitoring can blur the responsibilities of the supervisors with that of the management, shareholders, and depositors/policyholders for oversight of the financial institution. Thus, for example, if the institution is assessed to be in compliance with the microprudential regulations, investors/depositors/policyholders may conclude that they are relieved of the responsibility to conduct their own due diligence.<sup>15</sup> Should the institution fail, the depositors and investors will place the responsibility for the failure at the door of the supervisor, with the expectation that the public sector should bear the cost of the failure rather than the investors and depositors. This

<sup>12</sup> The Basel II rules provide several examples of the flaws that were later corrected by the Basel III framework. For example, Basel II allowed banks to count as offset guarantees from other entities in calculating their capital adequacy. While this may have been appropriate for an individual bank, it resulted in the transferring of risk to entities that were less well regulated and increased systemic risk.

<sup>13</sup> For example, the reliance on rating agency assessments in the capital adequacy calculations.

<sup>14</sup> While financial stability assessments identified some sources of systemic risk, including the risk posed by large and interconnected institutions and excessive credit expansion, they also took comfort from the compliance with regulatory measures of capital adequacy and from stress testing. This is reflected, for example, in the IMF's Global Financial Stability Reports (GFSR) and Financial Sector Assessments (FSAPs) in the years immediately preceding the GFC.

<sup>15</sup> The risks from overregulation are noted by Llewellyn (1999), who observes "there is the ever present moral hazard: that excessive and unrealistic expectations about what regulation can achieve reduces incentives on the owners and managers of regulated firms to monitor and control themselves, and for their customers to exercise due diligence."

moral hazard risk is compounded when there is a perception that a financial institution is too-big-to-fail and will be bailed out by the public sector.<sup>16</sup>

Second, microprudential regulations that seek to mitigate risk by constraining the risk-taking activity of financial institutions, or increasing the minimum buffers held against the risks, create incentives for circumvention. The incentives motivating the shareholders and management are profit maximization. If the prudential regulations bite, shareholders and management will seek to circumvent them by finding ways of taking on more risk and/or to hold smaller effective buffers. The history of banking provides many examples of rule circumvention.<sup>17</sup>

Circumvention creates a situation where a financial institution may be assessed to comply with the letter of the regulation, but the underlying risk exposures are left unaddressed. The moral hazard cost to the financial system is in the false security that compliance with the regulations imparts. The consequences were notable in the benign assessments of individual institutions and financial systems in the lead up to the GFC, which meant that emerging sources of risk were overlooked and preventive actions delayed.

The scope for circumvention generally increases with the complexity of the rules. For example, compare capital adequacy requirements, one based on leverage and another on risk-weighted assets. The former, simple ratio requires only measures of the total balance sheet and total capital and is difficult to circumvent. The latter requires a measure of risk-weighted assets and creates opportunities for mismeasurement of the risk in weighting the assets and thus in the capital adequacy requirement. Complex rules are less transparent and supervisors who are resource constrained are less able to monitor their implementation. In the run up to the GFC, supervisory rules became considerably more complex. As part of the post-GFC revisions, commercial banks' risk-weighted capital adequacy rules have been backstopped with a leverage ratio.

The third source of moral hazard was a focus of microprudential regulation in preventing financial institution failure. Financial institutions should be allowed to fail – but to fail in an orderly fashion – and impose losses on shareholders and investors so they are incentivized to become responsible for the functioning of the firm.

The moral hazard consequences were illustrated by the GFC. In part because of the supervisory approach, and expectations that large banks could/would not fail, resolution frameworks had not been prepared. However, large financial institutions did fail and because of the systemic threat the failures posed, the authorities had to resort to government bail outs of the investors and depositors.

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<sup>16</sup> The IMF's GFSR (2014) explores various approaches to quantifying moral hazard in the banking system and how this evolved for large (too-big-to-fail) and other banks before, during, and after the GFC.

<sup>17</sup> For example, under the Basel II capital rules, banks were not required to hold capital against counterparty risk losses (other than defaults) in their trading books and banks transferred claims from their banking to their trading books to circumvent capital rules on the banking book. The loophole was closed as part of the Basel III amendments (Basel Committee 2011a).

## Lessons from the Global Financial Crisis

The main lessons to be drawn from the GFC were:

- First, a microprudential approach to supervision is not sufficient as a means of safeguarding the economy from the risks of failures in financial systems;
- Second, a redesign of the framework for oversight of the financial system would require a much greater attention to identifying and mitigating the sources of systemic risk; and
- Third, in response to the above, authorities should incorporate a macroprudential approach as part of their oversight, and regulatory and supervisory frameworks.

## Main elements of the macroprudential approach to oversight of financial systems

A macroprudential approach requires some rethinking of the design of the framework for oversight of financial systems. The main elements involved in the macroprudential approach are:

- A process for identifying vulnerability to systemic risk;
- The development and implementation of macroprudential tools to mitigate systemic risk; and
- Cooperation among the agencies designated with macro and microprudential responsibilities within the macroprudential framework.

The supervisors play an important role in each of these elements. The practical implications for supervision are discussed further below.

## Processes for identifying vulnerability to systemic risk

The starting point for identifying vulnerability to systemic risk is usually a financial stability assessment (FSA). Such assessments are conducted both by national authorities and the IMF as part of its Financial Sector Assessment Program (FSAP). The latter are periodic, while the former may be prepared annually or semi-annually. The IMF also prepares a Global Financial Stability Report (GFSR) twice a year that examines the threats to global financial stability.

The FSAs are designed as system-wide assessments covering the regulated financial sector (typically, banking, insurance, securities, and payment systems) and potential sources of systemic risk in the unregulated sector. The assessment frameworks cover both the identification of financial sector risks and the adequacy of the arrangements for mitigating the risks, resulting in an assessment of the vulnerability of the financial system. The assessment of vulnerability is not unlike the concept of net risk used in risk-based supervision, though one derived for the financial system as a whole with the objective of identifying systemic risk.

One way of conceptualizing systemic risk is by analogy with the approach used to calculate expected loss in the assessment of individual risk exposures. Expected loss (EL) is defined as the loss given default (LGD) multiplied by the probability of default (PD). The expected loss approach can be extrapolated to macroeconomic/system-wide assessments, where the total

expected loss would correspond to systemic risk. Box 1 elaborates on this concept. One benefit of this approach is that it helps to identify the factors that should be of concern in financial stability assessments, namely those that could either result in a large loss, or amplify a loss, for the financial system and the real economy (the system-wide LGD) or increase the probability that the loss will occur (the PD). Box 1 outlines some of the factors of concern.

### **Box 1: An expected loss approach for evaluating systemic risk**

The macroprudential approach focuses on identifying and addressing the vulnerability of the economy to systemic risk. Systemic risk is defined as a disruption to the flow of financial services that has a major negative impact on the real economy.

One way of conceptualizing the vulnerability of the economy to systemic risk is by analogy with the approach to calibrating expected loss, but at the macroeconomic level.

Expected loss (EL) = Loss given default (LGD) X Probability of default (PD)

The expected loss is calculated as a product of:

- The loss given default (LGD) – the loss due to a failure, for example the impact of the collapse of a systemically important financial institution (SIFI) on the financial system and the real economy; and
- The probability of default (PD) – the likelihood that the failure will occur, for example how likely it is that a SIFI will collapse.

The sum of the individual expected losses would represent the overall macro vulnerability of the economy to systemic risk.

At the macroprudential level, the factors that will have an impact on the LGD will include:

- **Systemic relevance of the financial institution** – is it a SIFI? The greater the systemic relevance, for example, reflecting its size or interconnectedness or provision of critical functions, the larger the likely impact on the financial system and the real economy of its failure;<sup>18</sup>
- **The capacity to deal with failures should they occur** – how well-prepared are the crisis management arrangements? Poorly prepared arrangements will likely increase the risks of contagion, moral hazard, and costs of resolution; and
- **How robust or fragile is the financial system** – weaker financial systems are more likely to face losses of confidence that can amplify losses and result in bank runs.

The factors impacting the PD at the macro level will include:

- **The stage of the economic cycle and the macroeconomic risks** – is the economy facing the risk of recession? Are debt levels sustainable? Are asset prices elevated?

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<sup>18</sup> The designation of SIFI may apply to a group of financial institutions, which although individually small may pose systemic risk as a group. This could arise, for example, because of common business models, such that if one institution were to fail, the group would also be likely to fail with systemic consequences. International Monetary Fund et al. (2009).

- **The adequacy of capital and liquidity buffers** – are individual financial institutions' buffers large enough to handle stress events?
- **The incentive structures in the financial system to take on and mitigate risk** – is there moral hazard in the financial system? Is information adequate for effective market discipline?
- **The effectiveness of supervision** – is the supervisory process commensurate with the risks in the financial system? Does it include assessments of risk posed by the unregulated sector? Are SIFIs subject to more intensive supervision?

The FSA will more often than not include a discussion of the above topics, as well as potentially many others, in reaching conclusions about financial system vulnerability. For example, economic and financial stability indicators will be used to assess the stage of the economic cycle and the fragility of the financial system; stress testing to assess the adequacy of the capital and liquidity buffers and resilience to shocks; and reviews of compliance with international codes and standards to assess the adequacy of supervisory and crisis management arrangements.

Techniques for risk identification include the use of financial stability indicators (FSIs), heat maps, stress testing, statistical modelling using market data, and qualitative assessments. Following the GFC, certain subjects have received enhanced scrutiny as part of the FSAs because of their role in generating systemic risk. These subjects include systemically important financial institutions (SIFIs), the growth of credit above trend, financial intermediation in the unregulated sector, and the interconnectedness of the financial system. Stress testing has become more severe to take account of potential tail risks and feedback loops between the financial and real sectors, which amplify shocks.

Techniques for assessing risk mitigation include reviews of the adequacy of the institutional structures and responsibilities for systemic risk identification and mitigation, the adequacy of capital and liquidity buffers to absorb shocks, compliance with international regulatory standards and codes, and qualitative analysis. Following the GFC, enhanced attention has been paid to the supervision of SIFIs, to crisis management arrangements, and to targeting the standards and codes assessments to reflect better country circumstances.

## Macroprudential approach to mitigate systemic risk

The macroprudential approach to mitigate systemic risk includes:

- Structural design; and
- Macroprudential tools.

### Structural design

Incentive problems were a serious source of systemic risk leading to the GFC. They explain why market discipline did not work in preventing the build-up of risk. Incentive problems have to be addressed as part of a risk mitigation strategy, as no amount of supervision can compensate in

mitigating systemic risk in the face of such incentives. While supervision cannot replace market discipline, it has an important role in identifying and responding to specific market failures.<sup>19</sup>

Two issues need to be addressed to enhance market discipline:

- Asymmetric information; and
- Perverse incentives.

### **Asymmetric information**

Asymmetric information refers to a situation where one party to a financial transaction, usually the debtor, has access to information material to the valuation of the transaction that is not available to the other party, usually the creditor. Asymmetric information is a central problem in financial systems because it limits the capacity of investors/lenders and analysts to monitor effectively and to price correctly the risks in financial institutions and instruments. The problems of asymmetric information have increased as financial instruments, structures, interconnections, regulatory and accounting rules, and institutions' risk control and assessment techniques have become more complex and less transparent.

Enhancing the disclosure of *meaningful* information helps to reduce the problem of asymmetric information. Disclosures allow creditors/investors and analysts to assess directly the solvency of the financial institutions and risk in debt instruments. Greater disclosures reduce the need for investors to rely on delegating the responsibilities for monitoring to third party agents, such as rating agencies, with their potential conflicts of interests.

Supervisors have an important role to play in enhancing disclosures of their supervised entities. The revisions to the supervisory rules and core principles promote enhanced transparency and disclosures to strengthen market discipline (see below).<sup>20</sup> Enhanced disclosures are also a shield to supervisors for failures in their own supervisory processes. For example, disclosures allow investors to conduct their own evaluation of the solvency of institutions, rather than relying on a potentially misleading regulatory measure of the bank's capital adequacy.<sup>21</sup> The emphasis is on the *disclosure of meaningful information*, such as would allow investors and depositors to make informed investment decisions. It is not simply a question of the amount of information, as too often information disclosed is insufficiently focused to be able to assess risk exposures.<sup>22</sup>

### **Perverse incentives**

Incentive problems are the second fundamental source of financial instability. Examples contributing to the GFC included the conflicts of interest resulting in the failures of the rating agencies to identify risk; the compensation policies within financial institutions that rewarded risk taking over risk mitigation; moral hazard that reduced monitoring of risk exposures by investors and depositors and encouraged risk taking by institutions that were perceived to be too-big-to-

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<sup>19</sup> For a discussion of the role of incentives in supervision, see Čihák et al. (2012).

<sup>20</sup> For example, the Basel III Pillar 3 disclosure requirements (Basel Committee on Banking Supervision 2011a). Enhancing transparency and disclosures is a key element of IOSCO's supervisory approach and part of the IAIS core principles. It is also a key recommendation in the supervisory response to the risks associated with climate change (Brainard 2021).

<sup>21</sup> See above for examples of shortcomings in the Basel II rules.

<sup>22</sup> Enhancing disclosures of useful information may require innovative approaches, for example the publication of the results of stress tests of complex firms.

fail; and financial regulations that provided incentives to shift intermediation into less regulated instruments and the shadow banks.

The following structural design elements help to mitigate systemic risk.

- ***Crisis management arrangements*** have an important role to play in addressing moral hazard and enhancing market discipline by allowing financial firms to fail in an orderly fashion without creating systemic risk. The arrangements are designed to handle the failures of small institutions and the resolution of SIFIs to address the too-big-to-fail problem.
- ***Improving corporate governance and responsibility*** to take account of factors beyond short-term profit maximization. For example, defining the objectives of financial institutions over longer-term time horizons and reflecting this in their compensation practices would help in mitigating excessive risk taking.
- ***A clearer delineation between the responsibilities of public bodies and private investors*** for the monitoring of financial institutions. The public officials should focus as a priority on the externalities and market failures since these are outside the sphere of the private sector. Private investors should ideally take greater responsibility for the risks in individual firms, contracts, and instruments. The scope for this delineation is discussed further below.
- ***Recognition of the systemic risk arising from the design of financial regulation.*** The considerations include taking account of the impact of the regulations in banking, insurance, and securities in incentivizing the transfer of risk to less-regulated sectors and incorporating systemic risk into the core supervisory principles and regulatory rules and practices.

## Macroprudential tools

Macroprudential tools can be divided between those applied at the level of (i) the financial system as a whole, and (ii) individual financial institutions.

### Financial system tools

#### *Perimeter of regulation*

A key consideration in any macroprudential framework is to decide on the perimeter of regulation. Systemic risk can emerge outside the existing regulated entities, and hence the authorities need to identify, quantify, and monitor intermediation in unregulated entities. This can pose a major challenge as information is frequently lacking on activities in these entities. Hence a critical macroprudential tool is authority to access information from unregulated entities, especially when such entities have the potential to create systemic risk. Such an authority is usually incorporated in the powers of the macroprudential authority. Microprudential monitoring of regulated institutions' counterparties and exposures can provide early warnings of the emerging importance of activities outside the regulated sector.

Based on the assessment of the systemic risks posed, the macroprudential authorities can determine the need for follow-up actions. For example, they might require additional financial disclosures to allow better risk assessments or examine the adequacy of the governance and internal risk management practices. Where there is a specific threat to financial stability, the

macroprudential authorities might extend specific regulatory requirements to unregulated entities.

#### *Tax rules*

Tax rules can have unintended consequences in creating systemic risk and can be used to mitigate systemic risk. An example is the tax deductibility of interest payments on home mortgages, which can incentivize households to take on mortgage debt and contribute to unsustainable booms in house prices and mortgage credit. Supervisors are often called upon to take regulatory action to mitigate the risks of excessive growth of mortgage credit, for example increasing risk weights or applying sectoral-specific countercyclical capital buffers. However, when the underlying source of the excessive credit growth is the distortion in the tax rules, the supervisory action may be ineffective in mitigating the credit expansion and the systemic risk.<sup>23</sup>

#### *Public guarantees*

Public guarantees create moral hazard by limiting the exposure of the private sector to risk. For example, a central question in designing the coverage of deposit guarantees as part of protection schemes is how to balance the moral hazard consequences of setting too-high limits with the risk that setting the limits too low will not engender customer confidence and prevent bank runs. There is a general acceptance that the protection schemes should not extend to large depositors and policyholders, since they should have a role in monitoring and imposing market discipline on banks and insurers.

#### *Entry and exit of financial firms*

The rules and procedures that govern the entry and exit of financial institutions help to reinforce market discipline in the financial system. The procedures for closing and winding up financial institutions are important in this regard. The bankruptcy regime that applies to them can determine how quickly the firm can be liquidated. For example, if the shareholders can challenge the decisions of the regulators in the courts, the closure of the firm may be delayed for a considerable time, creating uncertainty and moral hazard, and undermining market discipline. The revisions to the architecture for crisis management following the GFC (see below) reflect these concerns in limiting the role of the courts in resolution decisions. The courts can adjudicate on requests for compensation following resolution but have no role in the resolution decisions themselves, which are left to the resolution authorities. The revisions also notably provide a framework for imposing losses on shareholders and some creditors in SIFIs while seeking to avoid public bail outs and instability in financial systems.

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<sup>23</sup> This point has been made by the Swedish supervisory authority, which is also the macroprudential authority.

## Macroprudential instruments on individual financial institutions

At the level of individual institutions, there are a range of potential macroprudential instruments. These are generally designed to address the two aspects of systemic risk:

1. Procyclicality in the financial system and real economy, also known as the *time series risk*; and
2. Interconnectedness and other vulnerabilities within the financial system, also known as the *cross-sectional risk*.

Considerable discussion and research have been devoted to the design and effectiveness of macroprudential instruments.<sup>24</sup> Examples of macroprudential supervisory tools include the Basel III countercyclical capital buffer (CCyB) and the SIFI capital charges. The CCyB is designed to be activated when the credit to GDP ratio exceeds trend by a specific margin, as a way to build up capital buffers in good times. The CCyB can be released in an economic downturn to help maintain the flow of credit in the banking system without its solvency being questioned. The objective in an economic downturn is to try to reduce the procyclicality in bank credit and the systemic risk created by the feedback loops between the financial and real sectors.<sup>25</sup>

The objective of the additional SIFI capital charges is to reduce the expected loss from the failure of a SIFI. This can be explained using the concept of expected loss, derived as the combination of loss given default (LGD) and probability of default (PD) (see Box 1). A financial institution is designated as a SIFI using the metrics of size, interconnectedness, and lack of substitutability. These metrics are proxies for the institution's systemic LGD – what would be the impact on the financial system and the economy if the financial institution should fail? The institution's PD will be determined, inter alia, by its capital adequacy (and factors such as its governance and controls and the intensity of supervision of the entity). As the systemic LGD of the SIFI is assessed to be high, the SIFI capital charges are designed to reduce its PD, and thus the expected loss from its failure.<sup>26</sup>

The macroprudential instruments also include measures that, while not part of the regular microprudential tool kit, are implemented at the level of individual institutions and may be overseen by the microprudential authorities.<sup>27</sup> These instruments include limits on debt-to-income (DTI) and loan-to-value (LTV) ratios imposed on individual borrowers and loan exposures. These tools can be designed by the macroprudential authority, with the objective of

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<sup>24</sup> For an overview, see International Monetary Fund (2013). The use of instruments with a macroprudential flavor has a long history: they were part of the policy framework to promote orderly liberalization of financial systems following the financial crises in Latin America in the 1980s (Johnston and Sundararajan 1999); following the Asian crises of 1997 they were considered along with effective supervision to manage the risks in short-term capital movements (Johnston and Otker 2009); and proposed as an instrument for managing rapid credit expansions in Eastern and Central Europe in the early 2000s (Hilbers et al. 2005).

<sup>25</sup> The Basel Committee (2010) states that: “The [CCyB] should help reduce the risk of the supply of credit being constrained by regulatory capital requirements that could undermine the performance of the real economy and result in additional credit losses in the real economy.”

<sup>26</sup> Financial Stability Board (2012) discusses approaches to increasing the intensity and effectiveness of SIFI supervision. For a discussion of the identification of SIFIs in the non-bank, non-insurance sector, see Financial Stability Board (2014a).

<sup>27</sup> For a list of instruments, see International Monetary Fund and Financial Stability Board (2011).

slowing the expansion of credit during boom times and reducing its procyclicality.<sup>28</sup> For example, during boom times, asset prices are elevated and thus loans that are based on collateral values (such as home mortgages) can expand; the expansion of the loans boosts the asset values and creates procyclicality (higher asset values allow for higher borrowing, leading to higher asset prices, etc.) This creates the risk of unsustainability in asset prices and systemic risk from a sharp contraction in credit and sharp falls in asset prices when the process is reversed. Limiting the LTV ratios is aimed at constraining this systemic risk.

## Coordination among agencies in identifying and mitigating systemic risk

As systemic risk is a system-wide concept, different agencies need to collaborate in the identification of the vulnerabilities to systemic risk and the approaches and instruments to mitigate it. Various different institutional frameworks have been proposed and implemented for the design of the macroprudential policy framework. Questions include whether the macroprudential mandate be assigned to the central bank, the supervisor, the Ministry of Finance, or a committee involving all three. The different institutional arrangements have various advantages and disadvantages, and the final decisions inevitably reflect the national institutional circumstances.<sup>29</sup>

Notwithstanding the specific institutional framework that is adopted, it is clear that multi-agency cooperation is essential for the effective identification and mitigation of systemic risk.

First, the identification of systemic risk involves both micro and macro assessments. As discussed in Box 1, an assessment of the vulnerability to systemic risk can be conceptualized in terms of the system-wide LGD and PD. The assessment of these factors involves some elements that are the responsibility of the microprudential supervisor – such as the assessment of the adequacy of capital and liquidity buffers; while others would fall to a macroprudential authority – such as the assessment of the stage of the economic/financial cycle; and others may fall in a gray area – such as which authority is responsible for the designation of SIFIs. The point to emphasize is that no single agency will have all the information and skills needed to conduct a complete assessment of the vulnerability to systemic risk. Thus, regardless of which agency is formally designated as the macroprudential authority, that agency will have to seek the cooperation of other agencies in its assessments.

Second, the tools to mitigate systemic risks also involve multiple agencies. As discussed above, the tools involve both system-wide and institution-specific tools. The successful mitigation of systemic risks will require that the role of the different tools be considered. For example, as mentioned above, efforts to use various DTI and LTV ratios to constrain a housing boom may be ineffective when the tax framework incentivizes mortgage borrowing. Also, microprudential regulation may be ineffective in the face of significant problems of asymmetric information and moral hazard that interfere with market discipline. The different agencies need to be aware of the scope and limitations of the tools at their disposal and collaborate to determine what should

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<sup>28</sup> In some countries, maximum LTVs are applied by microprudential regulators, while in others LTVs and DTIs are applied by retail conduct regulators as a consumer protection measure (since maximum LTVs and maximum DTIs can protect both lenders and borrowers). They are not, however, part of the Basel framework.

<sup>29</sup> See International Monetary Fund (2013).

be the best mix of system-wide and institution-specific instruments to address threats to financial stability.

## Implications of the macroprudential approach for microprudential supervision

The above discussion makes it clear that the microprudential authority will need to be deeply involved in the macroprudential approach. The macroprudential approach also substantially modifies the approach to microprudential supervision. This section outlines some of the critical modifications to the supervisory framework under the macroprudential approach. It outlines how the standard setting bodies have reflected macroprudential considerations in the core supervisory standards and examines some of the practical implications for microprudential supervision.

### Revisions to supervisory core principles

Following the GFC, the international standard setting bodies modified their supervisory core principles to reflect the lessons learned and in particular to incorporate macroprudential and systemic risk considerations. The standard setting bodies adopted different approaches: the Basel Committee incorporated macroprudential and systemic risk considerations into individual core principles (CPs); the insurance and securities standard setters, IAIS and IOSCO, included new principles to address the macroprudential and systemic risk concerns. In addition, a new framework was developed by the Financial Stability Board (FSB) to address crisis resolution, while the International Association of Deposit Insurers (IADI) updated their core principles. This framework and the revised IADI core principles were endorsed by the IMF/World Bank as a new standard for use in their assessments. Taken together, these revisions moved macroprudential considerations and the mitigation of systemic risk towards the center of microprudential regulation and supervision.

#### Basel Core Principles (BCPs) 2012

The 2012 revisions to the BCPs were intended to address many of the significant risk management weaknesses and other vulnerabilities highlighted by the GFC. In particular, the revisions take into account the need for greater intensity and resources to deal effectively with systemically important banks; the importance of applying a system-wide, macro perspective to the microprudential supervision of banks to assist in addressing systemic risk; and the increasing focus on effective crisis management. Detailed revisions to the BCPs that reflect macroprudential consideration are shown in the Appendix.

Some of the notable revisions to the BCPs include:

- **Bank failures** – more explicit recognition that the purpose of supervision is not to prevent bank failures. Supervision should aim to reduce the probability and impact of a bank failure, including by working with resolution authorities, so that when failure occurs,

it is in an orderly manner.<sup>30</sup> Effective crisis preparation and management and orderly resolution frameworks are required to minimize the adverse impact.

- **Corporate governance** – the revisions recognized that sound corporate governance underpins effective risk management and public confidence. To reflect this, a new principle is included giving greater emphasis to sound corporate governance practices.
- **Market discipline and transparency** – the revisions underlined the key role of robust market discipline in fostering a safe and sound banking system by including two new principles dedicated respectively to greater public disclosure and transparency, and enhanced financial reporting and external audit.
- **Risk-based supervision to take account of systemic risk** – the revisions strengthened the focus on effective risk-based supervision and the need for early intervention and timely supervisory actions. Supervisors should assess the risk profile of banks, in terms of the risks they run, the efficacy of their risk management, and the risks they pose to the banking and financial systems. Supervisors need to assess risk in a broader context than that of the balance sheet of individual banks and should consider the macro perspective. The budget and allocation of supervisory resources should reflect these considerations.
- **Data sharing for financial stability assessments** – individual bank data, data at sector level, and aggregate trend data collected by supervisors should be incorporated into the deliberations of authorities relevant for financial stability purposes (whether part of, or separate from, the supervisor) to assist in the identification and analysis of systemic risk. Supervisors should have access to relevant financial stability analyses or assessments conducted by other authorities that affect the banking system.
- **Regulatory perimeter** – in a revised principle, the supervisory risk perimeter is extended beyond accounting consolidation concepts. Supervisors must observe a broad canvas of risk, whether arising from within an individual bank, from its associated entities, or from the prevailing macro financial environment. Supervisors should also remain alert to the movement or buildup of financial activities outside the regulated banking sector (the development of shadow banking structures) and the potential risks this may create. Data or information on this should also be shared with any other authorities relevant for financial stability purposes.

## Insurance Core Principles (ICPs) 2011

New Insurance Core Principles were issued in October 2011 and were updated in most years between 2015 and 2019.<sup>31</sup> As with the BCPs, the revised ICPs incorporated lessons from the GFC. Enhanced attention is given to global systemically important insurers (G-SIIs), corporate governance, group supervision, accounting and valuation, and cross-border cooperation, crisis

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<sup>30</sup> The Basel Committee (2012) states: “It should not be the objective of banking supervision to prevent bank failures. However, supervision should aim to reduce the probability and impact of a bank failure, including by working with resolution authorities, so when the failure occurs it is in an orderly fashion.” Cooperation between the supervisory authority and the resolution authority is discussed in Toronto Centre (2020).

<sup>31</sup> International Association of Insurance Supervisors (2019).

management, and macroprudential surveillance. A new core principle, ICP 24, addresses the relationship between macroprudential surveillance and insurance supervision.<sup>32</sup>

## **Objectives and Principles of Securities Regulation 2010**

IOSCO's revised Objectives and Principles of Securities Regulation adopt eight new principles to reflect the lessons of the GFC as well as subsequent changes in the regulatory environment.<sup>33</sup> The press release accompanying the issue of the new principles noted, "Where traditional economic orthodoxy has considered systemic risk to be only a matter for prudential regulators, the financial crisis has shown that financial stability depends on both the virtuous twins of effective market regulation and effective prudential regulation. Therefore, markets matter for the identification and management of systemic risk and the new IOSCO principles covering systemic risk recognize the vital importance of the concept."<sup>34</sup>

The eight new IOSCO principles cover specific policy areas such as hedge funds, credit rating agencies, and auditor independence and oversight, in addition to broader areas including monitoring, mitigating, and managing systemic risk; regularly reviewing the perimeter of regulation; and requiring that conflicts of interest and misalignment of incentives be avoided.

## **Crisis Resolution and Deposit Insurance 2011**

The policy area of Crisis Resolution and Deposit Insurance (CRDI) was endorsed as a new standard by the IMF/World Bank in March 2011. CRDI is composed of two standards: Core Principles for Effective Deposit Insurance (IADI CP) issued by the IADI and updated in 2014,<sup>35</sup> and the FSB Key Attributes of Effective Resolution Regimes for Financial Institutions (KA).<sup>36</sup> Both the revisions to the IADI CP and the creation of a new standard for resolution regimes – the KA – reflected the weaknesses in crisis resolution arrangements revealed by the GFC, and especially the need by governments to resort to bail outs when faced with failures of SIFIs to avoid severe disruptions in financial systems. The KA were developed with the two-fold objective of allowing for the resolution of SIFIs without the use of public funds while avoiding disruptions to financial systems.

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<sup>32</sup> International Association of Insurance Supervisors (2011) provides a supervisory perspective on the insurance sector and financial stability. International Association of Insurance Supervisors (2013) discusses the assessment methodology for systemically important insurers.

<sup>33</sup> International Organization of Securities Commissions (2011).

<sup>34</sup> International Organization of Securities Commissions (2010).

<sup>35</sup> International Association of Deposit Insurers (2014).

<sup>36</sup> Financial Stability Board (2014b).

# Practical considerations in integrating the micro and macroprudential approaches

This section outlines some of the practical considerations for supervisors in integrating the macroprudential and microprudential approaches and explains how the microprudential attention to inherent risks can be integrated with the macroprudential focus on systemic risk.

## Identification of systemic risk

Regardless of which agency or committee is designated with the macroprudential mandate, supervisors must be involved in the process for identifying systemic risk and the design of the appropriate macroprudential policy response. The engagement of the microprudential supervisors should ideally have been considered in the design of the macroprudential framework. Institutional arrangements should be in place for consultation and information sharing among the authorities: central bank, supervisors, Ministry of Finance, and other agencies responsible for crisis management.

The macroprudential authority (whether within the supervisor or in another agency) should set out what information and assessments it will need on a regular basis from the microprudential supervisor. This may include ongoing assessments of the adequacy of provisions, capital, reserves, and liquidity buffers for SIFIs, and supervisory assessments of trends in risk exposures and risk mitigation strategies. The supervisors should be involved in periodic assessments on topics of system-wide concern. Various topics might include assessments of the exposures of regulated institutions to unregulated entities; the nature and impact of financial innovations on the risk profile of firms; stress testing and valuation practices; compensation practices; and channels of interconnectedness among financial institutions. While some of these assessments may be undertaken by the macroprudential authority, peer analysis of practices may require access to confidential supervisory information and be undertaken by the microprudential authority.

## Calibrating the macroprudential policy response

The microprudential supervisor should be part of the decision-making process for the use and calibration of macroprudential instruments. The design of the macroprudential policy response will first of all require a diagnosis of the source of the systemic risk and the size of the threat to economic and financial stability. Through its contacts with supervised entities and access to supervisory data, the supervisor is in an advantageous position to help diagnose the source of the systemic risk. For example, the supervisor will be identifying on an ongoing basis key risk trends and assessing the adequacy of risk mitigation strategies. These micro diagnostics can be aggregated and combined with assessments of the potential externalities to come to a view on the magnitude of systemic risk (see above).

Calibration of the macroprudential response will require coordination between the micro and macroprudential authorities. Some of the macroprudential tools are in the form of microprudential regulations. Examples include the Basel III CCyB and capital charges for domestic and global systemically important banks. While these tools may be set under the microprudential rules, the decisions on calibration should be taken in consultation with the macroprudential authority. The decisions would include when to activate/deactivate the CCyB

and at what level; the methodology used for the identification of the SIFIs; and the calibration of the SIFI capital charges.

In cases where macroprudential instruments are not part of the normal microprudential supervisory tool kit, such as maximum LTV and DTI ratios, the microprudential authority has an important role in monitoring the instruments. The supervisor's access to individual loans and client information and knowledge of bank lending practices provides the supervisor with a unique capacity to assess the impact and to advise on the design of the macroprudential instruments. For example, the supervisory review may provide early indications of the extent to which the instruments are being circumvented by banks and their borrowers, and the likely effectiveness of a ratcheting up of their application in response to a growing threat to financial stability.

## Implications for the supervisory processes

Under the macroprudential approach, there should be an explicit recognition (if there is not already one) of the relevant roles of the supervisors and the private sector in monitoring financial institutions. The private sector should be in the front line, accountable for the risks in private institutions and instruments; supervisors should provide a backstop with a focus on market failures<sup>37</sup> and systemic risks. Analytical assessments consistently highlight the importance of relying in part on market discipline to achieve good supervisory outcomes in a broad range of economic and developmental conditions.<sup>38</sup>

Effective orientation of the respective roles of the private and public sectors requires appropriate market and institutional design. In particular:

- Enhanced market discipline through improving information and removing sources of moral hazard;
- Recognition that financial institutions will be allowed to fail and that arrangements are in place to allow for the orderly closure of failing institutions; and
- Crisis management arrangements to handle potential systemic failures.

In providing a backstop, the supervisor has to be cognizant of whether the above conditions are in place, and the supervisory approach should evolve to reflect the nature of the market failures. For example, if because of the absence of effective legal powers, no bank has been allowed to fail, it would be difficult to eliminate moral hazard in the banking sector and the supervisory approach would likely involve intensive review of individual banking risks. However, once the appropriate legal and institutional framework is in place to allow for orderly bank failures, the supervision framework can evolve to reflect increasing market discipline.<sup>39</sup>

The reliance on market discipline will vary by sector and by the business models of the supervised entities. For example, the unique aspects of the insurance business model and the

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<sup>37</sup> These market failures may include an acute asymmetry of information that limits the extent to which investors can monitor financial institutions.

<sup>38</sup> See, for example, literature reviews of the rationale for financial regulation (Santos 2000, Llewellyn 1999). Barth et al. (2004) use a World Bank database to assess the relationship between regulatory practices and various outcomes in developing and emerging market economies.

<sup>39</sup> In the absence of the appropriate framework, even failures of small firms can create systemic risk, hence the attention to risk in such firms is consistent with the mitigation of systemic risk.

supervisory focus on protecting policyholders may make it less relevant than in banking where the supervisory focus is on the safety and soundness of banks and the banking system.<sup>40</sup>

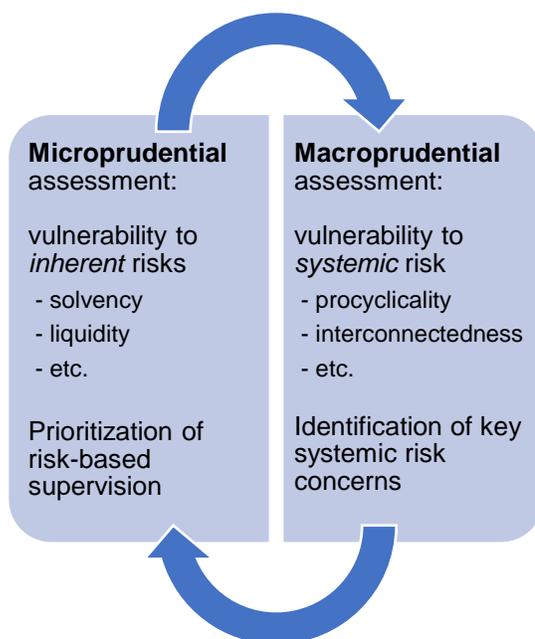
As discussed above, the modification to the banking supervisory standards incorporates many elements aimed at enhancing market discipline and systemic risk mitigation. Reflecting the evolutionary nature of the standards, the modifications also enhanced the supervisory approaches to mitigating inherent risks. This can pose a challenge for supervisors who are resource constrained, and they will have to prioritize. Where resources are limited, should supervision address an individual institution's inherent risk or systemic risk? As discussed below, this is not an all-or-nothing question, as the risks are interdependent.

### Designing risk-based supervision to address systemic risk

Risk-based supervision (RBS) has become an important tool in microprudential supervision. The focus of RBS is on the most important risks. That is to say those risks that, were they to crystallize, would have the greatest detrimental impact in terms of the supervisor's objectives. These are outcomes that would, for example, cause maximum damage to users of financial services or create serious financial instability.<sup>41</sup> In other words, systemic risk.

The principles for RBS include the emphasis on taking account of information from the wider economy and the system-wide effects in assessing the risk/impact of firms, and the need to develop a consistent framework for assessment that is forward-looking and outcome based. The macroprudential assessments provide the context for integrating systemic risk into the RBS framework.

A framework for the integration of the common objective of mitigating systemic risk in microprudential and macroprudential approaches is outlined in the graphic below:



<sup>40</sup> International Association of Insurance Supervisors (2011).

<sup>41</sup> Toronto Centre (2018).

- Microprudential assessments of the vulnerability of institutions to inherent risks remain important and should enter the macroprudential calculations as part of the assessment of systemic risk. As noted above, supervisors provide critical information for the identification of systemic risk through their ongoing supervisory assessments.
- Macroprudential assessments incorporate information from the microprudential authorities and combine this with system-wide analysis of issues such as those discussed in Box 1 to arrive at a view of the sources of systemic risk and the importance of the threats to financial stability. The macroprudential assessments identify the priorities and potential policy responses for safeguarding the stability of the financial system. These priorities and policy responses should, as discussed earlier, be developed in collaboration with the microprudential authorities. The macroprudential assessments are cross-sectoral, identifying the systemic risks posed by banking, securities, and insurance, as well as in other sectors and unregulated entities.
- The microprudential authorities use the macroprudential assessments to prioritize their RBS as a response to systemic risk. The priorities may be to intensify supervision of specific institutions or groups of entities designated as SIFIs, or topics for examination across a broader range of entities. The macroprudential assessments provide an evolving analysis of the priority financial stability threats that can be used for updating the focus of RBS so that it remains current and forward-looking.
- The integration of the microprudential and macroprudential draws on the respective authorities' comparative advantages, and reflects their co-dependency, with an efficient division of labor. Collaboration is essential.

The above framework is concerned with the common objective of mitigating systemic risk. As explained in the introduction, supervisors may have other unique objectives that would fall outside this framework.

One of the benefits to supervisors of the integrated approach is that it provides a framework for the prioritization of scarce supervisory resources in the face of competing demands for attention to evolving topics. For example, supervisors are increasingly being requested to take into account climate-related risks, financial inclusion and sustainable development goals, cyber risk, and pandemic risk as part of their assessments. These different topics can be prioritized partly in terms of the systemic threats they pose to the jurisdiction. Another benefit of an integrated approach is to embed microprudential supervision within the broader social welfare objectives of macroprudential policy.

## Conclusions

This Note has discussed the integration of the macroprudential and microprudential approaches to supervision. It has explained why the traditional approach to microprudential supervision was ineffective in preventing financial crises and the reasons for adopting a macroprudential approach. The macroprudential approach focuses on identifying and mitigating the sources of systemic risk, including those due to market failures. This Note has explained the nature of those failures and the necessary policy and institutional responses.

This Note has explained the co-dependency of micro and macroprudential supervision; why the microprudential authority will need to be deeply involved in the macroprudential approach; and

how the macroprudential approach modifies and informs the approach to microprudential supervision.

Microprudential supervision has an important role in:

- Identification of factors contributing to systemic risk; and
- Calibration and implementation of the macroprudential policy response.

The macroprudential framework provides an important context for microprudential supervision. Its identification and prioritization of the sources of systemic risk provides critical information for designing the microprudential response and, in particular, risk-based supervision.

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# Appendix: Modifications of the Basel Core Principles to reflect macroprudential considerations<sup>42</sup>

## BCP 1: Responsibilities, objectives, and powers

EC2: Objectives of supervision are to promote the safety and soundness of banks and the **banking system**.

EC3: The supervisor has the power to increase prudential requirements for individual banks and banking groups based on their risk profile and **systemic importance**.

EC6: When ... a bank is not complying with laws or regulations or it is likely to be engaging in unsound practices or actions that have the potential to jeopardize the bank or the **banking system**, the supervisor has the power to ...

(d) **cooperate and collaborate with relevant authorities to achieve an orderly resolution of the bank, including triggering resolution.**

## BCP 2: Independence, accountability, resources, and legal framework

EC6 (a): A budget that provides for staff in sufficient numbers and with skills commensurate with the risk profile and **systemic importance** of the banks and banking groups supervised.

EC8: In determining the supervisory program and allocating resources, supervisors take into account the risk profile and **systemic importance** of individual banks and banking groups.

## BCP 3: Cooperation and collaboration

EC1: Arrangements, formal or informal, are in place for cooperation **including analysis and sharing of information and undertaking joint work with all domestic authorities with responsibility for the safety and soundness of banks and/or the stability of the financial system.**

## BCP 8: Supervisory approach

An effective system of banking supervision requires the supervisor to develop and maintain a forward-looking assessment of the risk profile of the banks and banking groups proportionate to their **systemic importance** ... And have plans in place ... to take action **to resolve banks** if they become non-viable.

EC1: The supervisor uses a methodology for determining and assessing ... the impact and scope of risk ...

(b) which banks or banking groups present to the safety and soundness of the **banking system**.

EC4: The supervisor takes the **macroeconomic environment** into account in risk assessment... The supervisor also takes into account **cross-sectoral developments**.

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<sup>42</sup> See Basel Committee (2011b).

EC5: The supervisor... identifies, monitors, and assesses the buildup of risks, trends, and concentrations within and across the **banking system as a whole** ... The supervisor addresses proactively any serious threats to the banking system ... and **communicates any relevant trends to authorities responsible for financial stability**.

EC6: The supervisor assesses the bank's resolvability having regard to the bank's risk profile and **systemic importance** ... Where bank-specific barriers to orderly resolution are identified, the supervisor requires banks to adopt appropriate measures ... taking account of their impact on **soundness and stability**.

EC7: The supervisor has a clear framework ... for **handling banks in times of stress** ... such as to undertake recovery and resolution actions.

EC8: When the supervisor becomes aware of banking activities being performed ... **outside the perimeter of regulation**, the supervisor takes appropriate steps to draw the matter to the attention of the appropriate authority. Where the supervisor becomes aware of banks restructuring their activities to **avoid the regulatory perimeter**, the supervisor takes appropriate action to address this.

#### **BCP 9: Supervisory techniques and tools**

The supervisor uses a range of techniques and tools ... taking into account the risk profile and **systemic importance** of banks.

EC7: Where necessary, the supervisor **challenges the bank's board and senior management** on the assumptions made in setting strategies and business models.

#### **BCP 10: Supervisory reporting**

EC4: The supervisor collects and analyzes information ... at a frequency commensurate with ... the risk profile and **systemic importance** of the bank.

EC10: The supervisor assesses the suitability of experts ... and takes into account **conflicts of interest** that could influence recommendations by external experts.

#### **BCP 12: Consolidated supervision**

EC1: The supervisor ... takes action when risks arising from the banking group or entities in the wider group, in particular **contagion** and reputation risks, may jeopardize the ... banking system.

EC5: Due to the bank's risk profile and **systemic importance** ... the supervisor working with the national resolution authority develops a framework for cross-border crisis cooperation.

EC6: Due to the bank's risk profile and **systemic importance**, the supervisor ... develops a group resolution plan.

## **BCP 14: Corporate governance**

The supervisor determines the banks ... have robust corporate governance ... that are commensurate with risk profile and **systemic importance** of the bank.

EC7: The supervisor determines that ... the bank's **compensation system** ... has appropriate **incentives which are aligned with prudential risk taking**.

## **BCP 15: Risk management process**

The risk management process is commensurate with the risk profile and **systemic importance** of the bank.

EC2: The supervisor determines that the [risk management] processes are adequate ...  
(c) to assess risks arising from the **macroeconomic environment**.

EC12: The supervisor requires banks to have appropriate contingency arrangements ... If warranted by its risk profile and **systemic importance**, the contingency arrangements include robust and credible recovery plans.

EC13: Stress testing programs ...  
(b) adopt suitably severe assumptions and seek to address **feedback effects and system-wide interaction** between banks.

## **BCP 16: Capital adequacy**

The supervisor sets ... capital adequacy requirements ... that reflect risks undertaken ... in the context of the markets and **macroeconomic conditions** ... in which it operates.

EC4: The prescribed capital requirements reflect the risk profile and **systemic importance** of banks.

EC6 (b): To have in place feasible contingency arrangements ... in light of the risk profile and **systemic importance** of the bank.

## **BCP 17: Credit risk; BCP 22: Market risk; BCP 24: Liquidity risk; BCP 25: Operational risk**

Banks have adequate ... risk management ... that takes into account .... market and **macroeconomic** conditions.

EC1: Risk management processes ... consistent with ... **systemic importance** .... and take into account **macroeconomic** conditions.