Peer Review of Singapore

Review Report

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Foreword

Financial Stability Board (FSB) member jurisdictions have committed, under the FSB Charter and in the *FSB Framework for Strengthening Adherence to International Standards,*[1] to undergo periodic peer reviews. To fulfil this responsibility, the FSB has established a regular programme of country and thematic peer reviews of its member jurisdictions.

Country reviews focus on the implementation and effectiveness of regulatory, supervisory or other financial sector standards and policies agreed within the FSB, as well as their effectiveness in achieving desired outcomes. They examine the steps taken or planned by national authorities to address International Monetary Fund (IMF)-World Bank Financial Sector Assessment Program (FSAP) and Report on the Observance of Standards and Codes (ROSC) recommendations on financial regulation and supervision as well as on institutional and market infrastructure that are deemed most important and relevant to the FSB's core mandate of promoting financial stability. Country reviews can also focus on regulatory, supervisory or other financial sector policy issues not covered in the FSAP that are timely and topical for the jurisdiction itself and for the broader FSB membership. Unlike the FSAP, a peer review does not comprehensively analyse a jurisdiction's financial system structure or policies, or its compliance with international financial standards.

FSB jurisdictions have committed to undergo an FSAP assessment every five years; peer reviews taking place two-three years following an FSAP will complement that cycle. As part of this commitment, Singapore volunteered to undergo a peer review in 2017.

This report describes the findings and conclusions of the Singapore peer review, including the key elements of the discussion in the FSB's Standing Committee on Standards Implementation (SCSI) in December 2017. It is the twenty third country peer review conducted by the FSB, and it is based on the objectives and guidelines for the conduct of peer reviews set forth in the March 2015 version of the *Handbook for FSB Peer Reviews.*[2]

The analysis and conclusions of this peer review are based on the responses to a questionnaire by financial authorities in Singapore and reflect information on the progress of relevant reforms as of September 2017. The review has also benefited from dialogue with the Singaporean authorities as well as discussion in the FSB SCSI.

The draft report for discussion was prepared by a team chaired by Paul Hilbers (Division Director – Financial Stability, De Nederlandsche Bank) and comprising David Hoelscher (US Federal Deposit Insurance Corporation), Alexandra Lai (Bank of Canada), Zijun Liu (Hong Kong Monetary Authority), Danilo Palermo (Banco Central do Brasil) and Rastko Vrbaski (Swiss Financial Market Supervisory Authority FINMA). Sam Smith and Costas Stephanou (FSB Secretariat) provided support to the team and contributed to the preparation of the peer review report.

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[1] See http://www.fsb.org/2010/01/r_100109a/.

[2] See http://www.fsb.org/2015/03/handbook-for-fsb-peer-reviews/.

Abbreviations

ABSD	Additional buyer's stamp duty
BCBS	Basel Committee on Banking Supervision
CAR	Capital adequacy ratio
CCP	Central counterparty (clearing house)
CCyB	Countercyclical capital buffer
CDP	Central Depository (Pte) Limited
CET	Common Equity Tier 1
CFTC	US Commodity Futures Trading Commission
CGFS	Committee on the Global Financial System
CM	Chairman's Meeting
CME	Chicago Mercantile Exchange
CMG	Crisis management group
CMT	Crisis Management Team (MAS)
CPF	Central Provident Fund
CPMI	Committee on Payments and Market Infrastructures
DDRS	DTCC Data Repository Singapore
DI	Deposit insurance
D-SIB	Domestic systemically important bank
FI	Financial institution
FinTech	Financial technology
FMI	Financial market infrastructure
FSAP	Financial Sector Assessment Program
FSB	Financial Stability Board
FSC	Financial Stability Committee (MAS)
FS-ISAC	Financial Services Information Sharing and Analysis Center
FSR	Financial Stability Review
G-SIB	Global systemically important bank
G-SIFI	Global systemically important financial institution
GDP	Gross domestic product
HDB	Housing Development Board
IADI	International Association of Deposit Insurers
IAIS	International Association of Insurance Supervisors
IMF	International Monetary Fund
IOSCO	International Organization of Securities Commissions
IWST	Industry-wide stress test
KAs	FSB Key Attributes of Effective Resolution Regimes for Financial Institutions
LCR	Liquidity Coverage Ratio
LTV	Loan-to-value
MAS	Monetary Authority of Singapore
MBRC	Management Bank Resolution Committee (MAS)
MFSC	Management Financial Supervision Committee (MAS)
MIPM	Monetary and Investment Policy Meeting
MOF	Ministry of Finance
MOS	Mutual Offset System
MND	Ministry of National Development
MoU	Memorandum of Understanding
MSD	Macroprudential Surveillance Department (MAS)
MSR	Mortgage Servicing Ratio
NCWOL	No creditor worse off than in liquidation
NPL	Non-performing loan
OOHL	Owner-occupied housing loan
OTC	Over-the-counter

REIT	Real Estate Investment Trust
ROSC	Report on the Observance of Standards and Codes
RRP	Recovery and resolution plan
SCSI	Standing Committee on Standards Implementation
SDIC	Singapore Deposit Insurance Corporation
SGD	Singapore dollar
SGS	Singapore government securities
SGX	Singapore Exchange Limited
SGX-DC	Singapore Exchange Derivatives Clearing Limited
SGX-DT	Singapore Exchange Derivatives Trading Limited
SGX-ST	Singapore Exchange Securities Trading Limited
SIFI	Systemically important financial institution
SME	Small and medium-sized enterprise
SMTA	Supervisory Methodologies, Tools and Analytics group (MAS)
SSD	Seller's Stamp duty
TDSR	Total Debt Servicing Ratio
TLAC	Total Loss-Absorbing Capacity
TRPD	Technology Risk and Payment Department (MAS)
URA	Urban Redevelopment Authority

Executive summary

Background and objectives

The main purpose of this peer review is to examine two topics that are relevant for financial stability in Singapore: the macroprudential policy framework; and the framework for resolution of financial institutions. The peer review focuses on the steps taken by the authorities to implement reforms in these areas, including by following up on FSAP recommendations.

Main findings

Good progress has been made in recent years on both topics, reflecting Singapore's strong adherence to international standards and focus on financial stability. In particular, the active use of macroprudential policies, supported by a comprehensive risk assessment framework, has helped to mitigate housing price appreciation and moderate household leverage. Recent amendments to the resolution regime incorporated additional elements of the FSB *Key Attributes for Effective Resolution Regimes for Financial Institutions* (*Key Attributes*). While both areas are still under development (also at the international level), there is room for additional work. On the macroprudential framework, this involves clarifying responsibility for the formulation of macroprudential policies within the Monetary Authority of Singapore (MAS) and continuing to enhance the risk assessment framework. On the resolution framework, this involves extending the scope of bail-in and further clarifying loss allocation and ex post recovery of resolution funding; balancing supervision and resolution perspectives; and continuing work to refine, expand and operationalise the resolution planning framework.

Macroprudential policy framework

The authorities have taken important steps in recent years to develop the macroprudential policy framework and address relevant FSAP recommendations. Legislative amendments to the MAS Act in July 2017 prioritise MAS' supervision and financial stability objectives vis-à-vis its developmental objective. MAS has a broad range of prudential tools at its disposal for macroprudential purposes and has used them effectively, in conjunction with policy measures by other authorities, to address imbalances in the housing market in Singapore (see below). The analytical framework for systemic risk assessment has been enhanced through improved stress testing models and new methods for data analytics. In addition, MAS has strong data collection powers; has increased the granularity of data on housing loans; and intends to expand regulatory reporting by banks to enhance its surveillance of risks.

A particularly noteworthy example of the application of macroprudential policies in Singapore involves the housing market. MAS and relevant government authorities collaborated closely through an inter-agency property task force in the design of policy measures, which were then approved via the established governance process within each authority. The overarching objective was to attain a sound and sustainable housing market over the medium term, with any short-term trade-offs between objectives discussed by the task force members. From 2009 to the present, eight rounds of policy tightening were enacted through a combination of fiscal, prudential and land supply measures. The approach has been targeted, incremental and multi-pronged, supported by granular data and analyses shared among the authorities. The measures were communicated jointly in order to maximise their impact, and are re-calibrated in response to market developments (which are closely monitored).

Building on these accomplishments, as is the case in other countries, further steps can be taken to strengthen the macroprudential policy framework.

- ***Formulation of macroprudential policies***: As the central bank and integrated financial system regulator, MAS can draw on multiple perspectives through internal committees to facilitate the sharing of information and discuss the interactions between policies. The assessment of systemic risks, formulation of macroprudential policies and interaction with other government authorities is carried out by the Financial Stability Committee (FSC), a management-level committee chaired by the MAS Managing Director. At the same time, the Chairman's Meeting (CM), a Board-level committee chaired by the MAS Chairman and comprising the MAS Deputy Chairman, the Managing Director and two other Board members who are currently government ministers, approves major policy decisions relating to financial stability and the regulatory and supervisory framework.

  This division of labour seems appropriate to the extent that the CM reviews and approves the overall policy framework – such as for domestic systemically important banks (D-SIBs) and the countercyclical capital buffer – while MAS management remains responsible for the conduct of policies. At the same time, the CM is also involved in approving particular measures on the property market. Experience to date does not suggest any inappropriate governmental interference in macroprudential policy-setting in Singapore. However, in order to enhance transparency and accountability, it would be useful if the authorities could clarify responsibility within MAS for the formulation of its macroprudential policies. One option would be to explicitly assign responsibility to the CM for certain policies (e.g. relating to the property market) – subject to suitable legal and institutional safeguards – to reflect the fact that they necessitate close coordination with relevant government agencies. Another option would be to allow MAS management to independently determine – and be held accountable for – the conduct of all macroprudential policies, to further strengthen its operational independence in this area.

- ***Risk assessment framework***: The Macroprudential Surveillance Department at MAS monitors a broad range of indicators to assess risks and vulnerabilities across the financial system. While a broad overview of risk factors is presented to the FSC through annual discussions of the FSR and updates through other management fora, the information that is reported up to senior management is usually focused on specific themes identified at the departmental/group level as higher risk. The thematic focus has the benefit of making the information on risks targeted and tangible. However, it can also suffer from the drawback that the analysis focuses excessively on known risks and potentially misses emerging risks. The risk assessment process could be enhanced to allow for a more systematic and in-depth scan across all sectors being monitored through the FSC, to facilitate the identification of emerging risks and seek to address any data gaps on a forward-looking basis.

  MAS should also continue to expand its modelling capabilities in terms of stress testing and assessing the impact of macroprudential policies. On the former, it would be useful to enhance the industry-wide stress test to capture spillovers and second-round effects, rather than rely on severe scenario assumptions. MAS has been working to explicitly capture liquidity-solvency and macro-financial feedback, as well as interbank contagion, through econometric and network models. There is scope to enhance the methodology to better account for spillovers and second-round effects and thereby improve the analysis of how a particular scenario could impact the financial system. On the latter, it would be useful to enhance MAS' modelling expertise – for example, on the behaviour of housing market participants – to assess the impact of macroprudential policy measures, potentially making use of the granular loan-level data on household debt being collected.

Finally, MAS should further expand ongoing work to assess systemic risks from financial technology (FinTech) developments. Technology-enabled innovation in financial services is growing rapidly, and Singapore is positioning itself as a global FinTech hub. However, FinTech developments may have potentially important financial stability implications that will need to be assessed. MAS has already undertaken substantial work to strengthen the regulation and supervision of technology risk management practices among financial institutions as well as to promote initiatives to enhance the sector's cyber resilience. MAS could build on international work to incorporate FinTech developments in its risk assessment framework, e.g. by developing and monitoring indicators of relevant risks and incorporating meaningful cyber risk and other scenarios into its industry-wide stress test.

Framework for resolution of financial institutions

The authorities have made good progress in developing the resolution framework in Singapore to address the FSAP recommendations. The regime has a broad scope covering all financial institutions as well as the holding companies of such institutions. The 2017 resolution reforms introduced additional elements of the *Key Attributes*, including a power to impose a temporary stay on the exercise of early termination rights, a framework for the cross-border recognition of foreign resolution actions and resolution funding arrangements. The reforms to the regime also include related amendments to the Deposit Insurance and Policy Owners' Protection Scheme Act, to expand the use of the SDIC Deposit Insurance (DI) Fund to include the funding of the resolution of DI scheme members. Good progress has also been made in recovery and resolution planning for all local D-SIBs, and the 2017 resolution reforms formalise existing supervisory rules for recovery and resolution planning. With the implementation of these reforms, Singapore has a resolution regime broadly in line with the *Key Attributes*.

Notwithstanding this progress, further work is needed to fully align the resolution framework with the *Key Attributes* and its objectives, and to ensure that it can be applied in practice.

- ***Funding of resolution actions:*** The 2017 resolution reforms introduce a statutory bail-in power. However, the scope of liabilities subject to bail-in is limited to unsecured subordinated debt and loans, contingent convertible instruments and contractual bail-in instruments, and does not extend to other unsecured and uninsured creditor claims (e.g. senior debt liabilities). Exempting senior debt liabilities reduces the availability of loss-absorbing resources to the authorities to the authorities in resolution and may limit the effectiveness of the bail-in regime. It is therefore not fully aligned with the objective of the *Key Attributes* to ensure that authorities have capacity to allocate losses to shareholders and creditors in accordance with the creditor hierarchy, which is intended to create a market discipline effect and reduce the risk of moral hazard. It is also inconsistent with the premise that bail-in should facilitate a creditor-financed recapitalisation. The scope of bail-in in all other FSB jurisdictions with a statutory bail-in power extends to senior debt liabilities (with flexibility to apply discretionary exclusions in certain cases), on the basis that resolution authorities should have the power to write down and convert into equity unsecured and uninsured creditor claims. Some of those jurisdictions have also introduced, or are considering, minimum loss absorbency requirements to ensure that there are sufficient resources that can be bailed-in given the liability structure of their banks.

MAS is of the view that extending the scope of bail-in is not practicable or desirable as it increases the risk of contagion to the financial system and creates uncertainty. For example, uncertainty over the bail-in in of operational liabilities could cause disruption to the provision of critical functions, while selectively including some senior liabilities within the scope of bail-in would be inconsistent with the creditor hierarchy and could hence result in heightened risk of successful legal challenge. MAS considers that it is more important to be clear ex ante on the liabilities that would be subject to bail-in to provide certainty and clarity to the market. In addition, MAS notes that bail-in is only one of the tools in its resolution toolkit, and that its use should be balanced against an expected increase in uncertainty to the banks, their costs of funding, and overall impact on the efficiency of the economy. MAS also notes that D-SIBs are subject to higher prudential requirements than the Basel framework, and that their capital adequacy and leverage ratios are in excess of the minimum regulatory requirements. MAS hence intends to rely on regulatory capital instruments as the primary form of loss-absorbing capacity for these banks.

An increase in bank funding costs in jurisdictions where unsecured and uninsured creditor claims are within the scope of bail-in, reflects the reforms' objective to address the risk of banks being too-big-to-fail and to remove the implicit subsidy arising from market perceptions of government support for large banks. Affecting market expectations helps reduce moral hazard and ensure that systemically important financial institutions internalise the systemic risks to which they give rise. Moreover, legal challenges and potential contagion risks that could arise from the application of bail-in powers can be mitigated through actions such as subordination of bail-inable liabilities (through contracts, changes to the creditor hierarchy or the use of holding company structures) and through statutory exclusions from the scope of bail-in. The risk of contagion within the financial system should a firm enter resolution can also be mitigated, at least in part, by regulations that limit banks' investment in bail-inable instruments and liabilities.

As noted above, extending the scope of bail-in to include senior debt would increase the amount of bail-inable resources available to absorb losses, and thereby help achieve an orderly resolution and reduce potential resolution costs. This is important given that regulatory capital may no longer be available to absorb losses at the point of entry into resolution. In such a case, MAS would have to provide temporary public funding through the resolution fund to support timely implementation of resolution measures, especially given the limited amount of ex ante funds available in the DI Fund. The size of bail-inable resources is particularly important for Singapore given the size of its financial system assets (around nine times Gross Domestic Product (GDP)), including of the three local banking groups designated as D-SIBs (combined assets of three times GDP).

The authorities have stated in public communication that they do not aim to establish a 'zero failure' regime and that any costs incurred in the resolution of a firm will be recovered via contributions from that firm's sector. In spite of this, however, some market participants (e.g. credit rating agencies) have maintained expectations of sovereign support for

Singapore banks even after the recent enhancements to the resolution regime, citing the limited scope of bail-in as well as the concentrated nature of the banking system, the banks' role in the economy, and Singapore's fiscal strength. As the authorities continue to implement the resolution framework, they should take steps to minimise the risk of public support by extending the scope of bail-in to include senior liabilities and promulgating regulations on loss allocation and mandatory ex post recovery of resolution funding.

- ***Balancing supervision and resolution perspectives:*** MAS does not have a dedicated resolution unit, and relies instead on subject matter experts within the supervisory teams to conduct such work (including the development of resolution plans) in consultation with a resolution working group. This group, which comprises representatives from various departments (including policy, legal and supervision) involved in resolution issues in addition to their other day-to-day responsibilities, is overseen by a member of MAS' senior management outside of line supervision (but reporting to the Deputy Managing Director for Financial Supervision). MAS takes the view that this structure leverages on the institutional knowledge of supervisors, allows for an objective challenge from the resolution working group, and that a strict organisational separation of those two functions risks creating silos and a duplication of resources.

  The *Key Attributes* require the resolution authority to have adequate expertise, resources and operational capacity to perform its functions. This does not necessarily mean organisational separation of supervision and resolution, although several FSB jurisdictions have adopted this approach. However, it is essential to develop specialised resolution expertise and fora that allow staff supporting resolution-related activities to interact and share knowledge and views on an ongoing basis. In terms of governance, resolvability actions and resolution decisions – in particular as regards entry into resolution – should be informed by senior technical expertise in resolution matters, with a reporting line distinct from the supervision line, to provide a balance between supervisory and resolution interests.

  Having resolution work undertaken by supervision teams may create the potential for delay concerning resolution decisions. MAS notes that the risk of forbearance is mitigated by the balancing of supervisory judgment with independent and data-driven input from the Supervisory Methodologies, Tools and Analytics (SMTA) unit. Breaches of monitoring triggers are escalated by SMTA directly to the Management Bank Resolution Committee (MBRC), who can weigh supervisory and resolution interests in reaching decisions on the appropriate response. In addition, resolution plans and resolvability assessments are approved by the MBRC. However, this does not fully negate the risk of forbearance as decisions on resolvability may create tension with actions taken by the supervisory authorities (e.g. requirements on loss absorbing capacity may affect firms' capital and funding structures and risk profiles). Such risks may be avoided or mitigated if a member of MAS' senior management is explicitly tasked with championing the resolution viewpoint and concerns – both from a policy and operational perspective – in relevant internal fora.

- ***Refining, extending and operationalising resolution planning work:*** MAS should continue to develop the resolution framework in order to make it operational and ensure that firms are resolvable. One such step involves further work to refine resolution strategies and plans for D-SIBs in light of the new resolution tools in the MAS Act and to continue efforts to enhance cooperation with foreign authorities. This step is relevant both for local banks (which have grown fast through regional expansion in recent years) and for G-SIBs, particularly where MAS participates in the Crisis Management Group as a host authority. It includes signing Memoranda of Understanding with foreign resolution authorities and refining resolution strategies and plans for local D-SIBs to reflect the availability and potential application of new resolution tools. As part of the development of resolution strategies and plans, MAS should also continue to conduct resolvability assessments and take steps to address identified barriers to resolvability. Finally, given the cross-sectoral scope of the regime, it is important for MAS to extend resolution planning to insurance companies and financial market infrastructures (FMIs) that could be systemic in failure. As part of this work, MAS should consider whether sector-specific adaptations to the regime are required to implement resolution strategies and plans for these types of entities.

Recommendations

In response to the aforementioned findings and issues, the peer review has identified the following recommendations to the Singaporean authorities:

Macroprudential policy framework

1. The authorities should consider clarifying responsibility within MAS for the calibration and implementation of its macroprudential policies.
2. MAS should continue to enhance its risk assessment framework by: (a) broadening the risk assessment process to allow a more systematic and in-depth scan across all sectors being monitored; (b) expanding the use of modelling to better capture spillovers and second-round effects in stress testing and to better assess the impact of macroprudential policies; and (c) expanding ongoing work to assess systemic risks from FinTech.

Framework for resolution of financial institutions

3. The authorities should further strengthen the resolution framework to minimise the risk of public support by: (a) extending the scope of bail-in to include senior debt; and (b) promulgating regulations to further clarify loss allocation and the mandatory mechanism for ex post recovery from the industry of resolution funding.
4. MAS should take steps to balance supervision and resolution perspectives by: (a) establishing a resolution hub to bring together staff in supervisory and other teams responsible for supporting resolution-related activities; (b) ensuring that the hub has regular access to senior management, e.g. through a separate reporting line; and (c) tasking a member of MAS senior management outside of line supervision with responsibility to champion the resolution perspective.
5. MAS should continue to develop the resolution planning framework by: (a) refining resolution strategies and operationalising resolution plans, particularly for local D-SIBs; (b) addressing barriers to resolvability; and (c) developing sector-specific adaptations to resolution planning and resolution strategies for insurance companies and FMIs that could be systemic in failure.

1. Introduction

Singapore underwent an assessment under the Financial Sector Assessment Program (FSAP) in 2013. The FSAP Update included assessments of the Basel Committee for Banking Supervision (BCBS) *Basel Core Principles for Effective Banking Supervision,* International Association of Insurance Supervisors (IAIS) *Insurance Core Principles,* International Organization of Securities Commissions (IOSCO) *Principles and Objective of Securities Regulation* and Committee on Payments and Market Infrastructures (CPMI)-IOSCO *Recommendations for Securities Settlement Systems and Central Counterparties.*[3, 4]

The FSAP concluded that Singapore's financial system was highly developed and well-regulated and supervised. Overall compliance with supervisory standards in banking, insurance, securities and financial markets infrastructure was high. The banking sector appeared resilient to stressed conditions; the insurance sector was stable; capital markets did not pose material risks to financial stability and arrangements for over-the-counter (OTC) derivatives clearing appeared sound. The FSAP highlighted that Singapore is exposed to a broad array of domestic and global risks, especially in the light of its interconnectedness with other financial centres. It recommended that banks' capitalisation framework be strengthened with the implementation of the countercyclical buffer and that liquidity ratios for significant foreign currencies be closely monitored. It also recommended that onsite inspections of banks' credit risk be stepped up in view of rising corporate and household leverage, and that the Monetary Authority of Singapore (MAS) should continue its intensive monitoring of the asset management industry in order to minimise reputational risks. The FSAP made additional recommendations to further enhance arrangements for OTC derivatives clearing as well as crisis management and resolution.

The IMF's 2017 Article IV consultation[5] concluded that a cyclical upswing in growth is under way but that improved momentum has yet to extend beyond the export-oriented sectors, and structural headwinds to growth remain. Building on its strong economic fundamentals and long-term policy orientation, Singapore was embracing innovation and undertaking economic restructuring. The report concluded that the current accommodative policy stance is appropriate. As regards the financial system, the report noted that the banking sector is resilient with adequate buffers, but continued vigilance (particularly of household leverage) was warranted. The continuous upgrading of the regulatory framework – for example, with respect

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3 See *Singapore: Financial System Stability Assessment* (November 2013, IMF Country Report No. 13/325, http://www.imf.org/external/pubs/cat/longres.aspx?sk=41051.0). The ROSC assessments have been published and are available on the IMF website (http://www.imf.org/external/np/fsap/fsap.aspx).

4 In March 2013, the BCBS published its assessment of the consistency of the Basel III risk-based capital standards in Singapore with the Basel framework. See *Regulatory Capital Assessment Programme: Assessment of Basel III regulations – Singapore* (http://www.bis.org/bcbs/implementation/l2_sg.pdf). In December 2016, the BCBS published its assessment of the consistency of the Liquidity Coverage Ratio rule in Singapore with the Basel framework. See *Regulatory Capital Assessment Programme: Assessment of Basel III LCR regulations – Singapore* (http://www.bis.org/bcbs/publ/d390.pdf).

5 See Singapore's *2017 Article IV Consultation* (July 2017, IMF Country Report No. 17/240, http://www.imf.org/en/Publications/CR/Issues/2017/07/28/Singapore-2017-Article-IV-Consultation-Press-Release-Staff-Report-45144).

to the bank resolution regime and the framework for anti-money laundering/countering the financing of terrorism – should help improve resilience.

This peer review report has two main sections, corresponding to the two topics being reviewed. Section 2 focuses on the macroprudential policy framework, while Section 3 covers the framework for resolution of financial institutions. In addition, Annex 1 provides background information on the structure of Singapore's financial system and on recent regulatory developments, and Annex 2 describes Singapore's use of macroprudential policies to address risks in the housing sector. Annex 3 presents the follow-up actions reported by the authorities to other key FSAP recommendations; these actions have not been analysed as part of the FSB peer review and are presented solely for purposes of transparency and completeness.

2. Macroprudential policy framework

Background

The MAS is the macroprudential authority in Singapore and has a legal mandate to promote financial stability (see Annex 1 for a description of the regulatory framework). The FSAP noted that macroprudential policies target potential financial system vulnerabilities arising from capital flows, credit growth and asset prices. Two key elements of the approach are: (i) surveillance of systemic financial risk; and (ii) the design and calibration of policy instruments. The FSAP also noted that recent macroprudential measures had been focused on asset prices, especially in the housing market. It recommended that the authorities: consider subjecting loans for owner-occupied housing to a limit set by MAS; encourage over-extended households to reduce their leverage; stand ready to adjust macroprudential measures in the housing market in line with changes in market conditions; and further strengthen banks' capital framework with the implementation of the countercyclical capital buffer in line with the Basel III timelines. It also recommended that more granular data on household balance sheets be collected so as to improve the assessment of risks from household leverage.

This section reviews the progress made to date and planned next steps in developing a macroprudential policy framework, including vis-à-vis the aforementioned FSAP recommendations. Drawing on the experience of other FSB jurisdictions and on international guidance in this area,[6] it examines the main elements of the framework and recent experience with the use of tools for macroprudential purposes.

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[6] See *Macroprudential Policy Tools and Frameworks – Progress Report to the G20* (October 2011, http://www.fsb.org/2011/10/r_111027b/) and *Elements of Effective Macroprudential Policies* by the IMF, FSB and BIS (August 2016, http://www.fsb.org/2016/08/elements-of-effective-macroprudential-policies/); *Macroprudential Policy: An Organizing Framework* (March 2011, http://www.imf.org/external/np/pp/eng/2011/031411.pdf), *Institutional Models for Macroprudential Policy* (November 2011, http://www.imf.org/external/pubs/ft/sdn/2011/sdn1118.pdf), *Key aspects of macroprudential policy* (June 2013, http://www.imf.org/external/np/pp/eng/2013/061013b.pdf) and *Staff Guidance on Macroprudential Policy* (December 2014, http://www.imf.org/external/np/pp/eng/2014/110614.pdf) by IMF staff; and *Macroprudential instruments and frameworks: A stocktaking of issues and experiences* (May 2010, http://www.bis.org/publ/cgfs38.htm), *Operationalising the selection and application of macroprudential instruments* (December 2012, http://www.bis.org/publ/cgfs48.htm), *Experiences with the ex ante appraisal of macroprudential instruments*

Steps taken and actions planned

Institutional arrangements: MAS' principal objectives are: to maintain price stability conducive to sustainable growth of the economy; to foster a sound and reputable financial centre and to promote financial stability; to ensure prudent and effective management of the official foreign reserves of Singapore; and to grow Singapore as an internationally competitive financial centre. MAS promotes financial stability through microprudential supervision of individual financial institutions and macroprudential surveillance of the financial system as a whole. Financial stability objectives (the mitigation of vulnerabilities in the financial system) are achieved through both microprudential and macroprudential policy measures.

MAS' Macroprudential Surveillance Department (MSD) assesses risks and vulnerabilities in the financial system and conducts analysis on macroprudential policy and financial stability issues to support the internal Financial Stability Committee (FSC). The department, which comprises around 20 staff, forms part of the wider Financial Supervision Group and reports to the Assistant Managing Director responsible for Policy, Risk and Surveillance. To serve its financial stability mandate, MAS has also formalised internal governance arrangements to coordinate the conduct of macroprudential policies (see Box 1). These range from committees at the management level (FSC) to the Board-level Chairman's Meeting (CM).

Macroprudential and monetary policy objectives are balanced at the MAS Board level through overlapping memberships at the CM and the Monetary and Investment Policy Meeting (MIPM).[7] MAS notes that its monetary policy stance is formulated independently of macroprudential policy based on overall macroeconomic and price stability considerations, although the MIPM takes into consideration the macroprudential policies and financial stability issues discussed at the CM.

The Management Financial Supervision Committee (MFSC) covers both the macroprudential and microprudential perspectives, helping to strike a balance between the two mandates. The MAS states, in its monograph on *Objectives and Principles of Financial Supervision in Singapore*,[8] that financial stability is the overarching objective of its financial supervision, and is supported by both microprudential and macroprudential policies. This is important as certain prudential tools, depending on their design and calibration, may serve both objectives.[9]

(July 2016, http://www.bis.org/publ/cgfs56.htm) and *Objective-setting and communication of macroprudential policies* (November 2016, http://www.bis.org/publ/cgfs57.htm) by the Committee on the Global Financial System (CGFS).

7 The MIPM is a Board-level Committee that deliberates monetary policy decisions and decisions regarding the investment of MAS reserves. Discussions on the economy and the MAS budget also take place at the MIPM.

8 See http://www.mas.gov.sg/~/media/MAS/News%20and%20Publications/Monographs%20and%20Information%20Papers/Objectives%20and%20Principles%20of%20Financial%20Supervision%20in%20Singapore.pdf.

9 For instance, a loan-to-value ratio for property loans, applied through the cycle, is a microprudential tool; however, as that ratio is tightened during a run-up in property prices, it becomes a macroprudential tool (see Annex 2 on Singapore's experience with macroprudential tools in the housing sector).

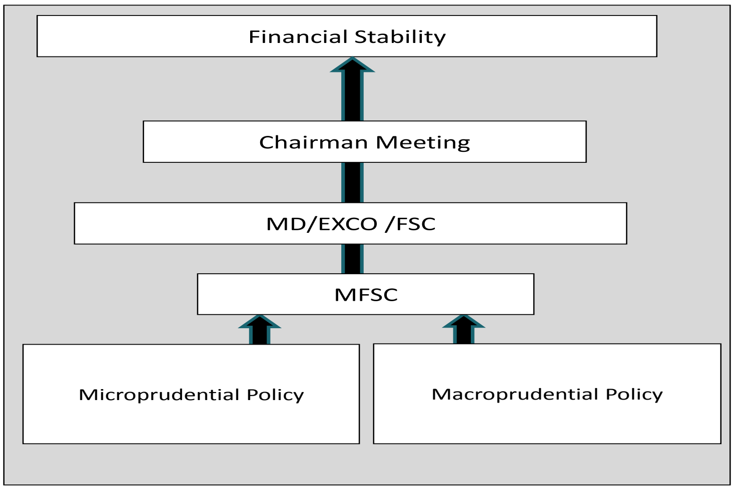
Box 1: Internal MAS structures for the conduct of macroprudential policy

The Chairman of MAS (currently also the Deputy Prime Minister and Coordinating Minister for Economic and Social Policies) presides over the Board-level Chairman's Meeting (CM). Other CM members are the MAS Deputy Chairman (currently the Minister for Trade and Industry), the Managing Director, and two other Board members who are currently government ministers. MAS senior management staff also attend the CM meetings. The CM approves major policy decisions on the regulatory, supervisory and macroprudential policy frameworks, while the implementation of policies (e.g. calibration of specific policy measures) is taken by management.[10] Management would, however, escalate to the CM policy decisions (such as those on the property market) that may be potentially sensitive or have economy-wide impacts, to ensure Board support for those policies. The CM, which meets on a fortnightly basis, also serves as a forum to discuss emerging financial stability issues.

Within MAS, two management-level committees are involved in macroprudential policy: the Financial Stability Committee (FSC) and the Management Financial Supervision Committee (MFSC).

The FSC meets quarterly and more often if needed. It is chaired by the MAS Managing Director and supported by the Macroprudential Surveillance Department as secretariat. Its membership includes senior management overseeing various functions, including the departments under the Financial Supervision function as well as the monetary policy and economic policy functions. The FSC supports the CM and serves as a platform to share information and analyses on financial system risks and to discuss macroprudential and financial stability issues. It is responsible for formulating macroprudential policy and any associated communication plan, taking into consideration microprudential and monetary policy perspectives. It also identifies financial stability issues that may require non-MAS policy tools and the relevant departments interact with other authorities to facilitate cross-agency coordination (e.g. inter-agency property market task force).

The MFSC is chaired by the Deputy Managing Director in charge of financial supervision and comprises senior management from the Financial Supervision function (composed of the Banking & Insurance; Capital Markets; Policy, Risk & Surveillance; and Data Analytics groups) and the General Counsel. It serves as a forum to discuss, on a weekly basis, regulatory and supervisory matters relating to regulated entities. The MFSC may refer financial stability-related matters to the FSC for approval.



MAS

[10] As an example, while the CM approved the policy framework for assessing domestic systemically important banks (D-SIBs), MAS management designated the list of D-SIBs and set the policy measures for them (e.g. higher loss absorbency requirements and local incorporation for D-SIBs with a significant retail presence).

The FSAP recommended that MAS should ensure its mandate for prudential supervision is not compromised by its developmental mandate, and that it should consider changes to the structure of the MAS Board[11] to strengthen operational independence in financial supervision. Section 4 of the MAS Act was amended in July 2017 to provide that MAS' objective to grow Singapore as an internationally competitive financial centre is subordinate to its supervision objective to foster a sound and reputable financial centre and to promote financial stability. However, MAS reports that it has not taken any action to change the structure of its Board, on the grounds that it has legal and institutional safeguards that protect against potential conflicts of interest and maintains full operational independence.

While MAS is the only public authority in Singapore with a macroprudential policy mandate, there are a number of forums through which data and surveillance insights are shared between MAS and other authorities for policy purposes. These include, for example, the Interagency Property Market Taskforce for monitoring developments and coordinating policy measures on the property market (see below); and various regular meetings involving senior government officials (at the Permanent Secretary level) to discuss emerging macroeconomic risks.[12]

Data for systemic risk analysis: MAS has broad powers to collect data under various legislation[13] to fulfil its mandates, including with respect to financial stability. In practice, MAS relies on a combination of regulatory returns, commercial data and ad hoc surveys for this purpose.

The existing reporting requirements cover a wide range of regulated entities, including both banks and non-bank financial institutions.[14] Moreover, MAS has commenced trade reporting requirements for interest rate, credit and foreign exchange derivatives and is in the process of introducing such requirements for commodity and equity derivatives. For broker-dealers and fund managers, MAS collects regulatory returns on a regular basis and conducts surveys to inform its policy and supervisory reviews. MAS is also planning to augment its collection of data on fund managers in light of global efforts by the FSB and IOSCO to address structural vulnerabilities in the asset management industry.

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[11] Under the MAS Act, the Board of Directors of MAS is appointed by the President. The Chairman of the Board is appointed by the President on the recommendation of the Cabinet. The Board of Directors is responsible for the policy and general administration of the affairs and business of MAS and informs the Government of the regulatory, supervisory and monetary policies of the MAS. The Board is ultimately accountable to the Parliament of Singapore through the Minister-in-charge of MAS, who chairs the MAS Board. For the current composition of the MAS Board, see http://www.mas.gov.sg/about-mas/overview/board-members.aspx.

[12] An example is the Economic Forum which includes (in addition to MAS), representatives from the trade and industry, finance, education, and manpower ministries.

[13] These include the MAS Act, the Banking Act, the Insurance Act, the Financial Advisers Act and the Securities and Futures Act.

[14] Examples of such data include: monthly returns from banks on various balance sheet and contingent liability items, assets under management and gross derivative values; monthly statements of assets and liabilities from finance companies; annual and quarterly returns on asset and liability exposures and annual returns on reinsurance management from insurance companies; monthly and quarterly statistics from approved exchanges; and data on risk exposures and clearing volumes of clearing members and monthly stress test and liquidity test results from approved clearing houses.

Data collected through supervisory returns are supplemented by information obtained from commercial sources and regular/ad hoc surveys. For example, the quarterly Housing Loans Survey, the monthly Housing Loan Profile Survey and the Annual Small and Medium-Sized Enterprise (SME) Financing survey provide granular information on the risk profile of loans.

Since MAS regulates almost all financial institutions in Singapore, there are few entities that fall outside its regulatory perimeter. Although MAS also has legal authority to collect data from unregulated entities to support its financial stability mandate, in practice it has worked with other authorities to obtain such data.[15]

The FSAP recommended that MAS collect more granular data on household balance sheets, drawing on surveys and strengthened credit bureau practices. MAS has worked with the credit bureaus in Singapore to improve the granularity of existing data collection, and has obtained regular monthly information on the unsecured debt situation from them. Specifically, credit bureau data was enhanced in June 2014 to provide information on total outstanding debt balances and total credit limits that an individual has across all financial institutions, while data on borrowers' unsecured debt balances were broken down into interest-bearing and non-interest-bearing components starting in April 2015. In addition, the Singapore Department of Statistics will start collecting wealth-related data in the upcoming Household Expenditure Survey 2017/18 which can be used to conduct analysis on household balance sheets, subject to data quality checks.

From 2013, MAS has been collecting – through a monthly Housing Loan Profile Survey – account-level information on borrowers' profile and loan characteristics (including debt servicing) for new housing loans. MAS plans to enhance the survey to capture outstanding loans as well. MAS is also revising its main statistical return for banks to collect more granular data, including assets and liabilities by currency, country and counterparty type.

MAS has a range of information-sharing arrangements with domestic and foreign authorities. Domestically, there is less need for coordination and information sharing compared to other jurisdictions due to the fact that MAS is the integrated financial system regulator. Nonetheless, where surveillance findings need to be discussed and policy measures coordinated across domestic authorities (e.g. at the inter-agency property task force), there are no constraints reported on information-sharing of aggregated data. Internationally, MAS has signed several memoranda of understanding (MoUs) with foreign supervisory authorities for information sharing and mutual cooperation. MAS holds regular bilateral meetings with regional central bank counterparts (e.g. China, Hong Kong, Japan and Thailand), in which the exchange of views on macroprudential issues is a regular agenda item. MAS also participates in a number of international and regional fora with a focus on financial stability issues.[16]

Risk assessment framework: MAS' approach to macroprudential policy has two key elements: (i) surveillance of systemic risks and vulnerabilities; and (ii) design and calibration of policy tools to mitigate systemic vulnerabilities. MAS relies on sector-specific approaches on high

[15] For example, MAS works with the Council of Estate Agency to collect information on households' purchase of overseas properties; with the Urban Redevelopment Authority to obtain data on property market indicators; and with the Ministry of Law to understand trends in consumer lending by moneylenders and pawnbrokers.

[16] Such fora include the FSB, the Association of South East Asian Nations (ASEAN), ASEAN+3, Executives' Meeting of East Asia and Pacific Central Banks (EMEAP) and South East Asian Central Banks (SEACEN).

risk areas (identified at the departmental/group level) and guided discretion to guide the operational implementation of macroprudential policy.

To identify systemic risks, MAS analyses developments and monitors a range of indicators across four sectors: banks, corporates and households, non-bank financial institutions and the external sector. Linkages between these sectors are identified through network analysis of balance sheet variables. Quantitative information is complemented by intelligence collected through dialogue with industry and interactions in international fora. Regular discussions of market developments with industry associations inform MAS' surveillance and risk assessments. In addition, MAS holds industry briefings with participants of their annual industry-wide stress tests to discuss stress test scenarios and aggregate findings (see below).

MAS employs a variety of tools to assess systemic risk, including a broad suite of indicators, property market models, stress tests and network analysis. Some indicators, high-level results of annual stress testing exercises and analysis of select issues are published in its Financial Stability Review (FSR). MAS is exploring new methods for data analytics (e.g. machine learning) to enhance its risk monitoring and assessment.

The banking sector is a key focus of surveillance, with regular monitoring of indicators from bank regulatory returns (e.g. credit and liquidity risk) supplemented by surveys on specific areas of concern.[17] In addition, MAS undertakes network analysis of interbank exposures.

The non-bank financial sector in Singapore is small compared to banks, which represent 65% of financial system assets (see Annex 1).[18] MAS conducts regular assessments of financial stability risks in the sector (both through its supervisory departments and system-wide surveillance) and monitors the banking system's exposure to non-bank FIs. MAS assesses broker-dealers' and funds' liquidity, leverage and maturity transformation risks as well as interconnectedness using regulatory returns, surveys and (in the case of funds) public databases.[19] In recent years, MAS has undertaken studies on particular types of non-bank entities that have the potential to pose financial stability risks.[20] For insurers, MAS has relied on regulatory returns and stress tests.

Risk assessments in the corporate and household sectors include sensitivity tests to examine the impact of targeted shocks. For example, MAS has used granular mortgage debt information to assess the debt servicing implications of interest rate increases on households, including the differential impacts on distinct sub-segments.[21] In the external sector, MAS seeks to identify and evaluate the impact of external shocks, including the channels through which they could

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17 For example, in early 2017 MAS conducted an ad-hoc survey on the composition of non-performing loans (NPLs) by banks in order to better understand the increase in the NPL ratio.

18 See http://www.mas.gov.sg/Regulations-and-Financial-Stability/Financial-Stability/2013/Financial-Stability-Review-2013.aspx. See also the FSB's May 2017 *Global Shadow Banking Monitoring Report 2016* (http://www.fsb.org/2017/05/global-shadow-banking-monitoring-report-2016/).

19 Broker-dealers in Singapore are largely prudentially consolidated into banking groups and are subject to Basel regulatory requirements on a consolidated banking group basis.

20 For instance, MAS published analyses on the Real Estate Investment Trust (REIT) sector in Singapore in the 2014 and 2016 FSR reports, in light of that sector's interconnectedness with the household and housing sectors.

21 See Box P in the 2015 FSR (http://www.mas.gov.sg/Regulations-and-Financial-Stability/Financial-Stability/2015/Financial-Stability-Review-2015.aspx).

propagate to Singapore. For example, the 2015 FSR noted that domestic lending is not funded by cross-border borrowing as banks in Singapore have sufficient domestic non-bank deposits to support domestic non-bank lending, and that cross-border borrowing is primarily on an intragroup basis, which tends to be more stable than other types of funding.

MAS uses stress testing as a tool for both microprudential and macroprudential surveillance of key banks and other financial institutions. Its stress testing integrates top-down and bottom-up approaches in the context of a common macroeconomic stress scenario. Box 2 provides more details on MAS' approach to stress testing, including the uses and communication of results.

Box 2: Industry-wide stress tests conducted by MAS

Since 2003, MAS has conducted an annual industry-wide stress test (IWST) of major financial institutions (FIs) using a common macroeconomic stress scenario. Recent IWST exercises have been based on scenarios that span a three-year horizon. The institutions covered are key banks, insurance companies and capital market intermediaries (clearing houses and clearing members). Around 30-40 banks, accounting for 80% of banking sector assets, participate in the exercise. While banks are selected using a size metric and based on their interconnectedness with other banks locally, FIs that provide key services to exchanges and clearing houses or have market-making roles are also included in the exercise. Supervisors may exercise judgement to include other FIs whose risk profiles have changed materially.

MAS identifies severe but plausible stress scenarios that reflect potential risks and vulnerabilities in the financial system. Specifically, the scenarios are based on emerging trends in the external and domestic macroeconomic and financial environment, as well as MAS' understanding of the potential vulnerabilities and transmission channels of the financial system and FIs' business models. As Singapore is a very open economy, the stress scenario parameters will typically include macroeconomic variables of external economies that have significant trade and financial linkages with Singapore.

The types of risks being assessed include solvency, credit, market and liquidity risks, as well as thematic dives into emerging risks. For example, the 2016 stress test included a cyber risk scenario for the banking and insurance sectors. The banks' bottom-up stress test results are complemented by reverse stress tests and MAS' own top-down validation. MAS is working to enhance its stress testing capabilities to account for indirect and second-round effects, and has made initial progress, e.g. by incorporating liquidity-solvency and macro-financial feedback as well as interbank contagion.

The findings from the IWST are shared extensively within MAS, including through management committees (e.g. MFSC, FSC) and the supervisory and policy departments. They have been used in the assessments of individual FIs as well as in policy work (e.g. capital and liquidity requirements).

MAS communicates publicly the aggregate IWST results in its FSR, usually in a dedicated box. It describes the stress scenario, and provides a breakdown of the selected financial market stress parameters. It does not identify specific FIs or provide quantitative outcomes, but rather recaps the overall system's resiliency. In its 2016 FSR,[22] MAS provided additional details on the system's sectoral exposures (corporate loans to the Transport, Storage, and Communication sector) and relative resiliency (to the household sector). MAS organises an industry workshop to discuss key trends and aggregate stress test results. Sector-wide issues and pockets of risk that banks may need to monitor would be highlighted in this workshop. In addition, MAS conducts meetings with individual FIs to discuss their stress testing methodologies and assumptions, risk profiles and stress test results, including any vulnerabilities identified and potential mitigants.

[22] See http://www.mas.gov.sg/Regulations-and-Financial-Stability/Financial-Stability/2016/Financial-Stability-Review-2016.aspx.

A particular area of attention for MAS in recent years has been the regulation and supervision of technology risk management practices among FIs as well as the promotion of initiatives to enhance the sector's cyber resilience (see Box 3). This work forms part of a broader MAS strategy to promote the adoption of financial technology (FinTech) in Singapore while safeguarding public confidence and financial stability.[23]

Box 3: MAS work on addressing cyber risks

MAS established a dedicated function in the 1990s to supervise FIs' technology risk management and payment infrastructures, with the objective of fostering stability, efficiency and cyber resilience. This function has evolved over time, and was recently re-structured to form the Technology Risk and Payments Department (TRPD). The formation of TRPD was aimed at positioning MAS for the increased financial technology adoption by FIs, and to further strengthen the industry's cyber security.

In terms of regulation, MAS has issued a set of technology risk management notices and guidelines to promote good cyber risk management practices and strengthen system security, resiliency and recoverability. Adherence to these rules is examined via onsite inspections, which may involve the development by FIs of a remedial plan on action in areas where gaps are identified. Targeted advisories on cyber security are also issued to FIs on a regular basis.

MAS partners with the industry to pursue initiatives to enhance the sector's cyber resilience.[24] To test the preparedness of FIs, industry-wide cyber tests are conducted regularly. Apart from testing FIs' incident and crisis management responses, these exercises test the communication and coordination among FIs, associations and authorities (including MAS) in responding to different scenarios impacting critical systems, payment infrastructure and customer data.[25]

To promote greater situational awareness and enhance effectiveness in neutralising cyber threats quickly, MAS established a secure platform called FINTEL to enable FIs to share timely cyber threat and attack information with one another. With MAS support, the Financial Services Information Sharing and Analysis Center (FS-ISAC)[26] has established its Asia-Pacific cyber intelligence centre in Singapore in order to enhance the industry's capability to monitor cyber threats. MAS has also set up a Financial Sector Security Operations Centre to collect and analyse threat indicators from key FIs, disseminate cyber intelligence to them, and oversee their responses to cyber incidents. Finally, MAS established a Cyber Security Advisory Panel, comprising cyber security thought leaders from around the world, to advise MAS on strategies to enhance the cyber resilience of Singapore's financial sector.

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[23] See http://www.mas.gov.sg/Singapore-Financial-Centre/Smart-Financial-Centre.aspx.

[24] Examples of sector-wide cyber projects undertaken with bank and insurance associations include developing guidelines on penetration testing and on cloud implementation security; developing an industry cyber incident management framework; and organising regular industry fora to facilitate knowledge sharing among FIs.

[25] Examples include: an Industry-Wide Business Continuity Exercise to test FIs' responses to various cyber-attack scenarios, including loss of confidential information, compromised data integrity and unavailability of critical financial services; an Industry Penetration Test to identify risk trends, and vulnerabilities with potential industry-wide impact; Industry Social Engineering Exercises (scheduled for late 2017) involving around 20,000 Singapore-based staff from 17 FIs to measure and improve the financial sector's security awareness and resilience against common social engineering techniques; and participation in cyber exercises organised by the Cyber Security Agency of Singapore to test cyber preparedness and incident response procedures.

[26] FS-ISAC is the global financial industry's resource centre for cyber threat intelligence analysis and sharing. Launched in 1999, it operates as a member-owned non-profit entity. See https://www.fsisac.com/.

Macroprudential tools: Tools available to MAS for macroprudential purposes include the countercyclical capital buffer (CCyB) and property market-related tools, particularly the loan-to-value (LTV) ratio, Total Debt Servicing Ratio (TDSR)[27] framework, and loan tenure limits. MAS has powers under various legislation (e.g. the Banking Act and the Securities and Futures Act) to apply its policy tools for macroprudential purposes without going through the legislative process. As mentioned above, MAS has a flexible approach to determining which policy measures are appropriate for the achievement of macroprudential objectives.

MAS' use of macroprudential policy measures have largely focused on the property market to date (see Annex 2), given the systemic linkages between that market, the financial system and the real economy. Since 2009, there has been active use of policy measures that were further refined in successive rounds of implementation in order to promote a sustainable property market; encourage greater financial prudence among households; and ensure sound lending standards. MAS' approach to the use of these measures has been targeted and incremental, with frequent review and adjustments to tool calibration.

Table 1: Tools used to address risks in the property market

Authority	**Tools**	**Objectives**	**Year introduced**
MAS	Elimination of interest-only mortgages	Encourage financial prudence among borrowers.	2009
	LTV limits, including minimum cash down payment	Encourage financial prudence among borrowers. Control loss exposures of financial institutions from loan defaults.	1996
	Loan tenure limits	Encourage financial prudence among borrowers. Lower initial monthly repayments arising from long tenure loans may result in borrowers over-estimating their ability to service their loans.	2012
	TDSR framework	Encourages financial prudence among borrowers. Strengthens financial institutions' credit underwriting practices.	2013
Ministry of Finance (MOF)	Seller's stamp duty	Curb speculative property investments.	2010
	Additional buyer's stamp duty	Mitigate excessive investment demand.	2011
Ministry of National Development (MND)	Land supply	Reviewed every six months and adjusted to match medium-term demand and supply.	N/A

[27] The TDSR is a ratio between the monthly total debt obligations and the gross monthly income of a borrower. Borrowers need to meet a certain TDSR threshold when they apply for property loans, taking into account all debt obligations including non-property-related loans.

A whole-of-government approach was taken by the authorities in adopting fiscal, prudential and administrative measures on the property market (see Table 1). The measures were coordinated through the Interagency Property Market Taskforce, chaired by the Deputy Secretary of the Ministry of National Development (MND),[28] which meets regularly to share data and surveillance insights, evaluate policy measures on the property market, and coordinate the communication of those measures. The task force aims to align the objectives of the different authorities under the overarching goal of promoting a stable and sustainable property market. In practice, this has meant the adoption of a medium-term horizon (or through-the-cycle perspective) with respect to the formulation of macroprudential policy. Several of the macroprudential policies introduced by MAS were coordinated and communicated as a package with measures introduced by other authorities, which has enhanced their effectiveness.

MAS uses a broad range of indicators to assess the effectiveness of its macroprudential policies,[29] and considers these measures to have generally been effective in improving the risk characteristics of new housing loans and moderating household leverage (see Chart 1 and Annex 2). One reason is the limited leakage of such measures into the non-bank financial sector, due to the fact that MAS regulates almost all credit providers. While licensed money lenders and credit cooperatives (regulated by the Ministry of Law and the Ministry of Culture, Community & Youth respectively) may grant mortgage loans, they are small and are subject to the same LTV limits on loans for the purchase of residential properties.

In order to better understand the impact of the relevant macroprudential measures, MAS developed a reduced-form empirical model of Singapore's residential property market. Model regressions between housing market indicators and policy measures (some of which are included as dummy variables) indicate that fiscal-based measures had a larger impact on property transactions and property prices than credit-based measures. Credit-based measures were more effective than fiscal measures in constraining increase in mortgage loans.

As previously noted, the FSAP included a number of recommendations to address the risks in the property market and household indebtedness more generally. As regards the recommendation to adjust macroprudential measures in the housing market in line with changes in market conditions, MAS reports that it has made a number of adjustments to policy measures to ensure that the rules remain effective while avoiding unintended consequences. For instance, to avoid constraining the ability of retirees from monetising part of the value of their properties, MAS announced in March 2017 the exemption of mortgage equity withdrawal loans, where the LTV of the loan is 50% or lower, from the TDSR framework.

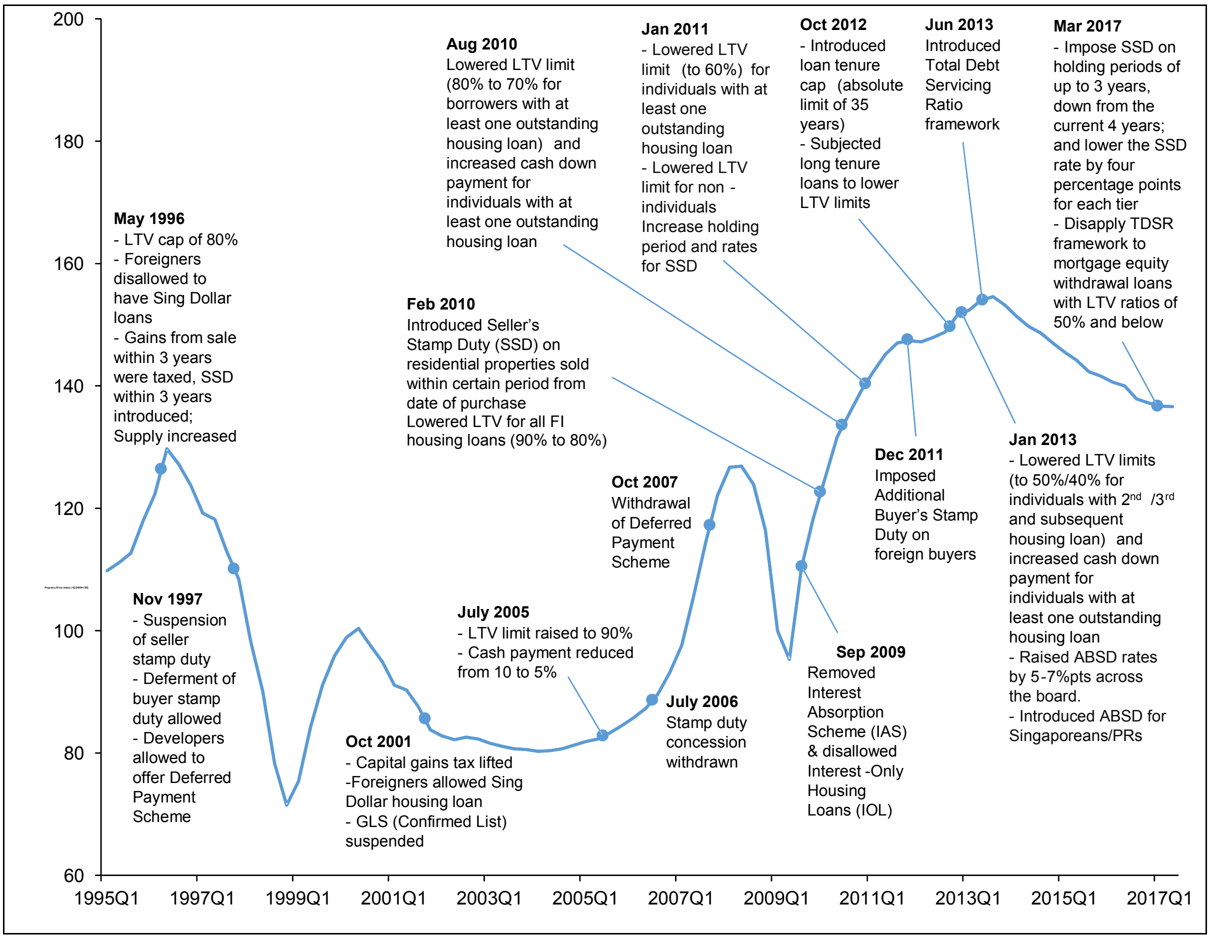
With respect to the FSAP recommendation to encourage over-extended households to reduce their leverage, MAS has implemented the following measures: (i) limits on unsecured lending

28 Taskforce participants includes the MND, MAS, Ministry of Finance and the Urban Redevelopment Authority of Singapore. The Housing Development Board (HDB), which is a statutory board under the MND, also attends task force meetings if coordination with the public housing market is necessary.

29 These include, for example, private residential property prices; the average tenure of new housing loans; the TDSR profile of new housing loan borrowers; the annual growth in household debt; and the number of borrowers with significant outstanding unsecured debt. See Annex 2 for details.

to borrowers who are 60 days past due on their unsecured credit or whose interest-bearing unsecured debt exceeds the prevailing industry-wide borrowing limit (introduced in June 2015 at 24 times of monthly income, tightened in a phased approach to 18 times in June 2017 and then to 12 times in June 2019);[30] (ii) financing restrictions on motor vehicle loans;[31] (iii) continued implementation of the property market-related macroprudential measures; (iv) outreach and education through FSR reports and enhanced online resources (MoneySENSE)[32] to help households manage mortgage debt; and (v) assistance to over-indebted households through debt management and consolidation plans.

Chart 1: Evolution of prices and policy measures in the property market in Singapore



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[30] See http://www.mas.gov.sg/news-and-publications/media-releases/2015/mas-will-phase-in-borrowing-limit-on-unsecured-credit.aspx.

[31] LTV and loan tenure limits were introduced for motor vehicle loans in 2013. They were initially set at 50% of the purchase value for motor vehicles with open market value greater than SGD 20,000 and 60% for motor vehicles with open market value of not more than SGD 20,000, and maximum loan tenure of five years. These measures were adjusted in 2016 to LTVs of 60% and 70% respectively, and maximum loan tenure of seven years.

[32] MoneySENSE is a national financial education program that provides financial education on managing debt through, inter alia, talks and workshops. See http://www.moneysense.gov.sg/.

MAS decided not to introduce a limit (as recommended by the FSAP) on owner-occupied housing loans as part of its overall limit on a bank's exposure to the property market, which is set at 35% of the bank's total eligible assets. MAS considers owner-occupied housing loans (OOHLs) to be of lower risk and that other demand-side prudential measures aimed at reducing household leverage (LTV and loan tenure limits, TSDR framework) provide adequate safeguards for banks' exposures to the property sector. MAS also believes that the ability of the borrower to repay the OOHL is key, and this in turn depends on the general performance of the economy rather than that of the property sector per se. MAS therefore argues that the inclusion of owner-occupied housing loans in banks' exposure limits is not necessary.

The FSAP also recommended that the authorities further strengthen banks' capital framework, with implementation of the countercyclical capital buffer in line with the Basel III timelines. MAS reports implementing, since 1 January 2016, a CCyB framework (including reciprocity requirements) consistent with the BCBS framework. Decisions on the activation and calibration of the CCyB are based on whether there is a build-up of systemic risk in the banking sector driven by broad-based credit growth and on whether the CCyB is an appropriate policy tool (possibly in conjunction with other measures) for addressing the identified risks.[33] CCyB decisions will be pre-announced by up to 12 months and at least annually in the FSR. As communicated in its November 2017 FSR, the MAS has set the CCyB rate at zero.

Communication and transparency: MAS communicates its assessment of financial stability risks and macroprudential policy measures through a number of channels:

- The FSR is an annual publication that reviews potential risks and vulnerabilities as well as the resilience of the financial system to these risks. MAS uses the FSR to describe its macroprudential policy framework (e.g. on the CCyB) and stress test results.
- The publication of the Annual Report is accompanied by a press conference in which the MAS Managing Director presents an overview of global and domestic economic and financial system developments, including the macroprudential policy stance.[34] This is complemented by other speeches by MAS management on financial stability issues.
- Macroprudential policy measures are announced via press releases, with explanations of the rationale and authorities' considerations in adopting these measures. If multiple authorities are involved, a joint press release between authorities is typically used to announce a package of measures, as has been the case for the property market.[35]

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[33] Indicators used to assess the build-up of systemic risk include the BCBS-recommended credit-to-GDP gap and other indicators used in the macroprudential surveillance framework. See Box H in the 2015 FSR (ibid).

[34] See, for example, the remarks by the Managing Director at the MAS Annual Report 2016/17 Media Conference (http://www.mas.gov.sg/News-and-Publications/Speeches-and-Monetary-Policy-Statements/Speeches/2017/MAS-Annual-Report-201617.aspx).

[35] See http://www.mas.gov.sg/News-and-Publications/Media-Releases/2017/Joint-Press-Release-on-Measures-Relating-to-Residential-Property.aspx and http://www.mas.gov.sg/News-and-Publications/Media-Releases/2013/Additional-Measures-To-Ensure-A-Stable-And-Sustainable-Property-Market.aspx.

- Macroprudential policy frameworks, such as for the CCyB and D-SIBs, undergo industry consultation before being implemented. Although certain property-related measures are not consulted on prior to their announcement to prevent undesirable market reactions (e.g. front-running of policies), MAS is in regular dialogue with the industry to collect views and feedback on the implementation of such measures.
- MAS may also receive occasional queries from Parliament members on macroprudential policy issues. The queries are typically answered by the Deputy Prime Minister in his capacity as Minister in charge of MAS. Following the Parliament session, the queries and answers are published on MAS' website.[36]

Lessons learned and issues to be addressed

The authorities have taken important steps in recent years to develop the macroprudential policy framework and address relevant FSAP recommendations. Legislative amendments to the MAS Act in July 2017 prioritise MAS' supervision and financial stability objectives vis-à-vis its developmental objective. MAS has a broad range of prudential tools at its disposal for macroprudential purposes, and has used them effectively, in conjunction with policy measures by other authorities, to address imbalances in the housing market in Singapore (see below). The analytical framework for systemic risk assessment has been enhanced through improved stress testing models and new methods for data analytics. In addition, MAS has strong data collection powers; has increased the granularity of data on housing loans; and intends to expand regulatory reporting by banks to enhance its surveillance of risks.

A particularly noteworthy example of the application of macroprudential policies in Singapore involves the housing market. MAS and relevant government agencies collaborated closely through an inter-agency property task force in the design of policy measures. The overarching objective was to attain a sound and sustainable housing market over the medium term, with any short-term trade-offs between objectives discussed by the task force members. From 2009 to the present, eight rounds of policy tightening were enacted through a combination of fiscal, prudential and land supply measures. The approach has been targeted, incremental and multi-pronged, supported by granular data and analyses shared among the authorities. The measures were communicated jointly in order to maximise their impact, and are re-calibrated in response to market developments (which are closely monitored). These measures have helped Singapore to mitigate housing price appreciation and moderate household leverage in recent years.

Building on these accomplishments, as is the case in other countries, further steps can be taken to strengthen the macroprudential policy framework. This includes, in particular, clarifying responsibility for the formulation of macroprudential policies within MAS and continuing to enhance the risk assessment framework.

Formulation of macroprudential policies: MAS, as the central bank and integrated financial system regulator, is able to draw on multiple perspectives through the use of internal committees to facilitate the sharing of information and discuss the interactions between policies. The assessment of systemic risks, formulation of macroprudential policies and

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[36] See, for example, http://www.mas.gov.sg/News-and-Publications/Parliamentary-Replies/2016/Reply-to-Parliamentary-Question-on-the-total-debt-servicing-ratios-of-Singapore-resident-households.aspx.

interaction with other government authorities to facilitate coordination (e.g. interagency property market task force) is carried out by the FSC, which is a management-level committee chaired by the Managing Director. At the same time, the CM, which is a Board-level committee chaired by the MAS Chairman, approves major policy decisions relating to financial stability and the regulatory and supervisory framework. For measures on the property market in particular, MAS collaborates with relevant government authorities through the inter-agency property task force in the design of policy measures. The measures are then approved via the established governance process within each authority.

This division of labour seems appropriate to the extent that the CM reviews and approves the overall policy framework (e.g. for D-SIBs and the CCyB buffer), while MAS management remains responsible for the conduct of policies. At the same time, the CM is also involved in approving measures on the property market. Experience to date does not suggest any inappropriate governmental interference in macroprudential policy-setting in Singapore. However, in order to enhance transparency and accountability, it would be useful if the authorities could clarify responsibility within MAS for the formulation of its macroprudential policies. One option would be to explicitly assign responsibility to the CM for certain policies (e.g. relating to the property market) – subject to suitable legal and institutional safeguards – to reflect the fact that they necessitate close coordination with relevant government agencies.[37] Another option would be to allow MAS management to independently determine – and be held accountable for – the conduct of all macroprudential policies, to further strengthen its operational independence in this area.

- ***Recommendation 1*****: The authorities should consider clarifying responsibility within MAS for the calibration and implementation of its macroprudential policies.**

Risk assessment framework: The Macroprudential Surveillance Department (MSD) at MAS monitors financial system developments and a range of indicators across various sectors, with the objective of assessing risks and vulnerabilities arising from developments in Singapore and the global economy. While a broad overview of risk factors is presented to the FSC through annual discussions of the FSR and updates through other management fora,[38] the information that is reported up to senior management is usually focused on specific themes identified at the departmental/group level as higher risk. The thematic focus has the benefit of making the information on risks targeted and tangible. However, it can also suffer from the drawback that the analysis focuses excessively on known risks and potentially misses emerging risks. The risk assessment process could be enhanced to allow for a more systematic and in-depth scan

[37] Several publications by international bodies emphasise that institutional mechanisms should support willingness to act against the build-up of systemic risk and reduce the risk of delay in policy actions. The FSAP stated that "the structure of the MAS board, which includes several government ministers, was considered by assessors to be potentially inconsistent with full supervisory independence, and consideration should be given to addressing this situation". MAS notes that legal and institutional safeguards are already in place to mitigate potential conflicts of interest for Board members.

[38] This includes the monthly credit trends reports, quarterly property market reports and quarterly counter-cyclical capital buffer reports by MSD as well as the quarterly risk dashboards coordinated by the Risk Management Department.

across all the sectors being monitored through the FSC, which could facilitate the identification of emerging risks and seek to address any data gaps on a forward-looking basis.

MAS should also continue to expand its modelling capabilities in terms of stress testing and assessing the impact of macroprudential policies. On the former, it would be useful to enhance the industry-wide stress test to capture spillovers and second-round effects, rather than rely on severe scenario assumptions. MAS has been working on enhancements to explicitly capture liquidity-solvency and macro-financial feedback, as well as interbank contagion, through econometric and network models. More work could still be done on capturing both direct links (through financial transactions) and indirect links (through market movements or behaviour of financial institutions) that have the potential to transmit and amplify shocks.[39] There is scope to enhance the methodology to better account for spillovers and second-order effects and thereby improve the analysis of how a particular scenario could impact the financial system.

On the latter, it would be useful to enhance MAS' modelling expertise to assess the impact of macroprudential measures, potentially making use of the granular loan-level data on household debt being collected. For example, models could be developed to predict the behaviour of housing market participants so as to inform the calibration of such measures on an ex-ante basis.[40] Moreover, macroeconomic models that endogenise households' decisions on housing, consumption and investment could shed light on the impact of macroprudential measures on the real economy and hence the optimal trade-off between different types of policies.[41]

Finally, MAS should further expand ongoing work to assess systemic risks from FinTech developments. Technology-enabled innovation in financial services is growing rapidly, and Singapore is positioning itself as a global FinTech hub.[42] At the same time, however, FinTech developments may have potentially important financial stability implications that will need to be assessed.[43] MAS has already undertaken substantial work to strengthen the regulation and

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[39] For examples of stress testing frameworks that take into account spillovers and second-round effects, see *A Guide to IMF Stress Testing: Methods and Models* by Li Ong (IMF book, http://dx.doi.org/10.5089/9781484368589.071), *Stress testing of banks: an introduction* by Dent et al (Bank of England Quarterly Bulletin 2016 Q3, http://www.bankofengland.co.uk/publications/Documents/quarterlybulletin/2016/q3/a1.pdf) and *A macro stress testing framework for assessing systemic risks in the banking sector* by Henry and Kok (ECB Occasional Paper Series No 152, October 2013, https://www.ecb.europa.eu/pub/pdf/scpops/ecbocp152.pdf).

[40] For example, see Box 5 of the Bank of England's June 2014 Financial Stability Report (http://www.bankofengland.co.uk/publications/Documents/fsr/2014/fsrfull1406.pdf).

[41] For example, see *The Impact of Macroprudential Housing Finance Tools in Canada: 2005-10* by Allen et al (May 2017, BIS Working Papers No. 632, http://www.bis.org/publ/work632.htm); *Addressing Household Indebtedness: Monetary, Fiscal or Macroprudential Policy?* by Alpanda and Zubairy (December 2014, Bank of Canada Staff Working Paper 2014-58, http://www.bankofcanada.ca/2014/12/working-paper-2014-58/); and *Monetary and Macroprudential Policies* by Angelini et al (July 2012, ECB Working Paper No 1449, https://www.ecb.europa.eu/pub/pdf/scpwps/ecbwp1449.pdf).

[42] In particular, MAS was amongst the first authorities to introduce a regulatory sandbox to enable FinTech start-ups and FIs to experiment in providing innovative financial products or services. It is also harnessing supervisory technology to carry out supervision in a more efficient and effective manner.

[43] Potential risks to financial stability could include increasing procyclicality and volatility in financial markets; the emergence of new innovative players that may become too-big-to-fail; disruptions to the functioning of the system caused by operational and cyber risks; and a rapid loss in the franchise value and viability of established market participants. See, for example, the FSB report on *Financial Stability Implications from*

supervision of technology risk management practices among FIs as well as to promote initiatives to enhance the sector's cyber resilience. MAS could build on international work in this area[44] to incorporate FinTech developments in its risk assessment framework, e.g. by developing and monitoring indicators of relevant risks and incorporating meaningful cyber risk and other risk scenarios into its industry-wide stress test.

- ***Recommendation 2*: MAS should continue to enhance its risk assessment framework by: (a) broadening the risk assessment process to allow a more systematic and in-depth scan across all sectors being monitored; (b) expanding the use of modelling to better capture spillovers and second-round effects in stress testing and to better assess the impact of macroprudential policies; and (c) expanding ongoing work to assess systemic risks from FinTech.**

3. Framework for resolution of financial institutions

Background

The FSAP noted that responsibilities in the area of crisis management and resolution are clearly allocated, highlighting MAS' combined role as the prudential supervisor, resolution authority and lender of last resort. These responsibilities were found to be supported by robust information sharing and coordination arrangements with other Singaporean authorities. The FSAP also found that MAS coordinates closely on crisis management and resolution with other jurisdictions and that there are no legal impediments to share information, subject to confidentiality safeguards, with foreign supervisors and resolution authorities. It noted, however, that the allocation of certain resolution tools to the Minister-in-Charge might compromise the operational independence of MAS in resolution matters and recommended that the resolution framework be reviewed and strengthened to enhance MAS' operational independence in bank resolution.

The FSAP found that the development of recovery and resolution plans (RRPs) is progressing at a pace consistent with other significant financial centres. MAS requires all D-SIBs as well as selected non-bank financial institutions to prepare and submit recovery plans, and to provide

FinTech: Supervisory and Regulatory Issues that Merit Authorities' Attention (June 2017, http://www.fsb.org/2017/06/financial-stability-implications-from-fintech/); the IMF note on *Fintech and Financial Services: Initial Considerations* (June 2017, SDN/17/05, https://www.imf.org/en/Publications/Staff-Discussion-Notes/Issues/2017/06/16/Fintech-and-Financial-Services-Initial-Considerations-44985); chapter 4 of the De Nederlandsche Bank's *Overview of Financial Stability* report (Spring 2016, https://www.dnb.nl/en/news/dnb-publications/financial-stability-report/index.jsp); and the US Office of Financial Research Viewpoint on *Cybersecurity and Financial Stability: Risks and Resilience* (February 2017, https://www.financialresearch.gov/viewpoint-papers/2017/02/15/cybersecurity-and-finanancial-stability/).

[44] See, for example, the CPMI-IOSCO *Guidance on cyber resilience for financial market infrastructures* (June 2016, http://www.bis.org/cpmi/publ/d146.htm), the BCBS consultative document on *Implications of fintech developments for banks and bank supervisors* (August 2017, http://www.bis.org/bcbs/publ/d415.htm), and the FSB *Summary Report on Financial Sector Cybersecurity Regulations, Guidance and Supervisory Practices* (October 2017, http://www.fsb.org/2017/10/summary-report-on-financial-sector-cybersecurity-regulations-guidance-and-supervisory-practices/).

information to support MAS' development of firm-specific resolution plans. The FSAP stated that, while the powers to resolve banks are generally robust, there is scope to enhance the resolution toolkit further to enhance its credibility and reduce moral hazard. In particular, it recommended that consideration be given to widening the use of deposit insurance funds for broader resolution purposes as well as reinforcing the role of industry in bearing the costs of bank failures.

This section examines progress made by the authorities in strengthening the resolution framework for banks and other financial institutions since the FSAP.[45] It takes into account recent reforms initiated by MAS in 2016 and passed by Parliament in July 2017 (the "2017 Resolution Reforms" – see Box 4 for an overview). Relevant issues include the objectives and scope of the framework; resolution authority and powers; the funding of resolution measures and firms in resolution; information sharing and cooperation with foreign resolution authorities; and recovery and resolution planning requirements. Drawing on the FSB's *Key Attributes of Effective Resolution Regimes for Financial Institutions* (*Key Attributes* or KAs)[46] and supporting implementation guidance,[47] it examines the objectives, scope and functioning of the framework in order to identify any gaps and lessons of experience for FSB members.

Steps taken and actions planned

Institutional arrangements: The resolution regime set out in the recent legislative reforms to the MAS Act covers all financial institutions.[48] The regime also extends to the regulated holding companies and non-regulated operational entities of such institutions as well as domestic branches of foreign banks. The powers and tools in the regime are applicable to all financial institutions, with a limited number of sector-specific adaptations for the insurance sector. MAS is the designated resolution authority for these institutions, irrespective of whether they are systemically important. In this role, MAS is responsible for determining if the conditions for entry into resolution are met, designing the resolution strategy and implementing the resolution; it is also responsible for reviewing firms' recovery plans, assessing their resolvability and drawing up firm-specific ex ante resolution plans.

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[45] See also the FSB's March 2016 *Second Thematic Review on Resolution Regimes* (http://www.fsb.org/2016/03/second-thematic-review-on-resolution-regimes/) and the July 2017 fifth progress report to the G20 on *Resilience through resolvability – moving from policy design to implementation* (http://www.fsb.org/2016/08/resilience-through-resolvability-moving-from-policy-design-to-implementation/).

[46] See http://www.fsb.org/2014/10/key-attributes-of-effective-resolution-regimes-for-financial-institutions-2/.

[47] The guidance falls into two categories: (i) general guidance on the implementation of the *Key Attributes*, including the *Key Attributes Assessment Methodology*; and (ii) sector-specific guidance setting out how individual KAs should be considered in conjunction with the KA to which it relates. For a list of the relevant guidance, see http://www.fsb.org/what-we-do/policy-development/effective-resolution-regimes-and-policies/understanding-the-key-attributes/.

[48] These comprise banks, finance companies, merchant banks, financial holding companies, insurers, operators or settlement institutions of designated payment systems, approved exchanges, recognised market operators, licensed trade repositories, licensed foreign trade repositories, approved clearing houses, recognised clearing houses, approved holding companies, capital markets services licensees (excluding those in the business of providing credit rating services), trustees for collective investment schemes, and licensed trust companies regulated by MAS under the relevant legislation.

Box 4: The 2017 Resolution Reforms

The 2017 Resolution Reforms were passed by Parliament in July 2017 and will commence operation on a date to be appointed by the Minister-in-Charge.[49] The reforms focus on six areas:

1) *Recovery and Resolution Planning*

MAS has already set RRP requirements for D-SIBs. The 2017 Resolution Reforms consolidate MAS' powers for financial institutions of all sectors and authorise MAS to require financial institutions to prepare recovery plans, submit information to MAS for resolution planning and, where necessary, to adopt measures to remove barriers to resolvability.

2) *Temporary Stay on Early Termination Rights*

The duration of the stay is limited to two business days, and subject to the safeguard that termination rights triggered independently of the resolution action remain exercisable. The stay covers financial and non-financial contracts, with the exact scope to be prescribed in regulations. A similar stay is proposed for reinsurance contracts. The maximum duration of this stay will be set out in regulations.

3) *Statutory Bail-in*

MAS will have the power to write-down, or convert into equity, all or part of unsecured subordinated debt and unsecured subordinated loans, contingent convertible instruments and contractual bail-in instruments. The statutory bail-in regime will not apply to senior unsecured debt. The statutory bail-in regime will only apply to instruments and liabilities issued or contracted after the reforms enter into force (i.e. existing instruments and liabilities will not be subject to statutory bail-in).

4) *Cross-Border Recognition of Resolution Actions*

The reforms introduce a framework under which MAS will be able to recognise resolution measures taken by a foreign resolution authority. Recognition of foreign resolution actions is subject to certain safeguards (see "Cross-border cooperation and information sharing" below).

5) *Creditor Compensation Framework*

The reforms introduce a "no creditor worse off than in liquidation" (NCWOL) safeguard, under which creditors and shareholders who do not receive, under the resolution of a financial institution, at least what they would have received had the institution been liquidated, will be eligible for compensation for the difference.

6) *Resolution Funding Arrangements*

MAS will establish a resolution fund, which MAS will be able to use to provide temporary liquidity to support the timely implementation of resolution measures. The resolution fund will be funded at the point of use in resolution by a loan granted by MAS, with costs incurred in the use of the fund recovered from the industry on an ex post basis. Where the institution is liquidated, the fund will have priority to its assets over unsecured creditors and shareholders. The mechanics and operation of the fund will be set out in regulations.

[49] See https://sso.agc.gov.sg/Acts-Supp/31-2017/Published/20170801?DocDate=20170801.

The approval of the Minister-in-Charge[50] is required to implement certain resolution actions, such as the compulsory transfer of the business of, or shares in, a failing institution to a third party or the compulsory restructuring of the share capital of a failing institution. The Minister-in-Charge's decision will be based on a proposal submitted by MAS staff, including a determination as to why resolution should be triggered, and a recommendation as to what measures ought to be taken. The FSAP recommended to review the role of the Minister-in-Charge with a view to enhancing the operational independence of MAS.

MAS takes the view that the involvement of the Minister-in-Charge is a necessary step to bring public interest considerations to the decision making process, balancing expediency and fairness to stakeholders and giving more legitimacy to the chosen resolution strategy. MAS also notes that the Minister-in-Charge is not involved in the operational and technical aspects of the resolution process and that the requirement for approval is a final procedural step in the exercise of those resolution powers, similar to institutional arrangements or requirements in other FSB jurisdictions.[51] To this end, MAS provides the necessary expertise to support the Minister-in-Charge on resolution matters. In light of these considerations, the authorities have not initiated any changes to the role of the Minister-in-Charge since the FSAP recommendation and, in line with that approach, the 2017 Resolution Reforms provide that the exercise of bail-in powers and decisions to recognise a foreign resolution action also be subject to the approval of the Minister-in-Charge.

The MOF only plays a role in resolution when there are no viable private sector solutions for dealing with the failure of systemically important financial institutions (SIFIs), or when public resources are at risk. The Minister of Finance sits on the Board of MAS (though not on an ex officio basis). Where joint action is required, the MOF and MAS have arrangements in place to coordinate on the crisis response.

The Singapore Deposit Insurance Corporation (SDIC) operates both the deposit insurance and policy owners' protection schemes in Singapore (see Box 5). The SDIC has a paybox mandate limited to the reimbursement of insured deposits and payment to protected policy owners. It does not participate in the design of resolution strategies or take decisions on resolution actions, which is the responsibility of MAS. The SDIC and MAS have an MoU on information sharing and coordination in the context of a deposit insurance payout. The authorities are in the process of expanding the existing MoU to cover communication relating to the use of the deposit insurance funds for resolution purposes, as provided in the 2017 Resolution Reforms.

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[50] As previously noted, MAS is accountable to a designated Minister (Minister-in-Charge), who in turn is accountable to Parliament for the actions taken by MAS. The current Minister-in-Charge (and Chairman of MAS) is the Deputy Prime Minister and Coordinating Minister for Economic and Social Policies. At the time of the last FSAP, that individual held the posts of Deputy Prime Minister and Minister of Finance.

[51] As described in the FSB's March 2016 *Second Thematic Review on Resolution Regimes* (ibid), the regimes in seventeen FSB jurisdictions include a requirement that the use of resolution tools is in the public interest.

Box 5: The Singapore Deposit Insurance Corporation (SDIC)

The SDIC operates the deposit insurance and policy owners' protection schemes in Singapore. It is incorporated as a company limited by guarantee and its Board of Directors is accountable to a cabinet ranking official; currently, this is the same individual as the Minister-in-Charge of MAS. Three individuals ("company members") appointed by the Minister-in-Charge select and appoint the members of the Board of Directors. Directors may hold other positions (e.g. in industry or academia), but must be independent from scheme members as well as from MAS. A chief executive, appointed by the Board, is responsible for the day-to-day management of SDIC.

The SDIC charges risk-based premiums to member institutions based on their amount of insured deposits. The percentage of fully covered depositors fell to 87% in recent years, which prompted MAS to propose an increase of the insured amount so as to restore the coverage rate to 91%.[52] Under the proposal, this would be financed by a moderate increase of premia, while the target level of the fund would remain at 0.3% of insured deposits and its build-up period extended from 2020 to 2028.

All banks and finance companies in Singapore are members of the deposit insurance scheme, while all insurers licensed by MAS to carry out direct life business (other than captive insurers) or direct general business (other than captive insurers or specialist insurers) are members of the policy owners' protection scheme. MAS may exempt institutions from membership. Cross-scheme lending between the deposit insurance scheme and the policy owners' protection scheme is not permitted.

MAS organisational structure and entry into resolution: MAS does not have a designated organisational unit with responsibility for resolution work and operationally separate from supervision.[53] Resolution work, including the development of resolution plans, is carried out by the supervisory teams (with individual supervisors acting as subject matter experts on particular topics, including resolution) in consultation with a cross-departmental working group for resolution led by MAS senior management.

Matters pertaining to resolution work are approved by the Management Bank Resolution Committee (MBRC), which is chaired by the Deputy Managing Director for Financial Supervision and comprises the heads of supervisory, policy, legal and technology risk and payments units. The MBRC meets at least annually to assess firms' resolvability and to approve resolution plans, and on an as needed basis for potential resolution cases. Escalation of potential resolution cases is designed as a bottom-up process. A dedicated unit, the Supervisory Methodologies, Tools and Analytics (SMTA), which does not have day-to-day supervisory responsibilities, monitors quantitative and qualitative data with a view to identifying and escalating breaches of monitoring triggers directly to MBRC.

Cases are escalated to the MBRC if a firm enters into signs of distress ("orange" status) or threatened viability ("red" status). In the case of D-SIBs, or other financial institutions which the MBRC considers may have a systemic impact or require public funding, the decision on whether to initiate resolution proceedings is escalated to the Crisis Management Team (CMT). The CMT is an ad hoc coordination forum chaired by MAS' Managing Director and comprises

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[52] This is in line with the recommendation of 90% in the International Association of Deposit Insurers (IADI) *Core Principles for Effective Deposit Insurance Systems* (November 2014, http://www.iadi.org/en/core-principles-and-research/core-principles/). The MAS consultation is available at http://www.mas.gov.sg/~/media/MAS/News%20and%20Publications/Consultation%20Papers/Consultation%20Paper%20on%20DI%20Scheme%20and%20DI%20PPF%20Act%20and%20Regulations.pdf.

[53] See http://www.mas.gov.sg/About-MAS/Overview/Organisation-Chart.aspx.

senior management from both the supervisory and central banking functions of MAS. For cases not escalated to the CMT, the MBRC can initiate resolution proceedings or the winding-up of the financial institution through ordinary insolvency proceedings.

The decision of the CMT (or the MBRC, as the case may be) to place a financial institution into resolution will be based on quantitative and qualitative data as well as on supervisory judgment and insights from MAS' supervision groups as to whether the institution has failed or is likely to fail. The decision is not constrained to balance sheet insolvency and may include considerations such as, for example, whether the business of a financial institution is being conducted in a manner detrimental to the public interest, whether the financial institution has breached any provisions of the applicable legislation or licensing condition, or whether the financial institution has lost public or creditor confidence. If resolution is triggered, the resolution action will be organised internally within MAS, staffed from various functions and steered by the MBRC or the CMT as appropriate.

Recovery and resolution planning and resolvability requirements: Prior to the 2017 Resolution Reforms, the framework for recovery and resolution planning was based on general supervisory powers in the respective sector-specific legislation rather than explicit statutory provisions. As part of the reforms, MAS' powers to impose RRP requirements will be formalised and consolidated, and MAS will have an explicit power to require financial institutions to remove impediments to resolvability. The reforms also include a draft notice and guidelines setting out the content of RRPs including, among other things, recovery triggers and recovery options and information requirements on critical functions, material entities and booking arrangements for resolution planning.

MAS identified seven banks as D-SIBs in April 2015[54] and requires those firms to submit recovery plans. MAS has completed annual reviews since 2012 of the recovery plans of the three D-SIBs that are headquartered in Singapore, and has reviewed the recovery plans of the four other banks that were identified as D-SIBs in April 2015. D-SIBs are required to update the recovery plans at least annually and after any material changes to the structure, business or financial position of the bank.

For resolution planning, MAS requires D-SIBs to submit relevant information on their critical functions and cross-border inter-dependencies, including an assessment of the feasibility of separating or isolating the critical business activities or functions in a restructuring or resolution scenario, to facilitate the development of a resolution plan. Resolution plans are reviewed and updated annually and after material firm changes. For the three D-SIBs in Singapore that form part of a global systemically important bank (G-SIB), the development of local resolution plans will take into account the group-level plans and be done in cooperation with the home resolution authority. The first iteration of D-SIB resolution planning (including a resolvability assessment) was completed in 2017 and has focused on management information system capability to report information in times of crisis, estimating capital and liquidity needs,

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[54] Seven D-SIBs were identified in the April 2015 D-SIB framework: DBS Bank, Oversea-Chinese Banking Corporation, United Overseas Bank, Malayan Banking Berhad, Citibank, Standard Chartered Bank and The Hong Kong and Shanghai Banking Corporation. The first three institutions are local banking groups, while the latter four are subsidiaries of foreign banking groups (including three G-SIBs). See http://www.mas.gov.sg/News-and-Publications/Media-Releases/2015/MAS-Publishes-Framework-for-Domestic-Systemically-Important-Banks-in-Singapore.aspx for further information.

identifying critical functions, and mapping critical services to critical functions for the purposes of operational continuity. The extension of recovery and resolution planning requirements to other banks beyond D-SIBs may be considered at a later stage.

For insurers, MAS plans to undertake a formal review to determine whether any insurer should be designated as systemically important in Singapore, and therefore subject to recovery and resolution planning requirements. Nevertheless, the four largest life insurers have already commenced recovery planning.[55]

MAS currently imposes recovery and resolution planning on systemically important financial market infrastructures (FMIs). This includes all approved clearing houses (CCPs), depositories, and licensed trade repositories. Recovery planning for SGX group, the biggest operator of FMIs in Singapore, is already underway (see Annex 3). The only systemically important payment system in Singapore is owned and operated by MAS itself and will thus not be subject to recovery and resolution planning, in line with the *Key Attributes*.

Resolution toolkit: Box 6 describes the tools available under the resolution framework and the role of the court. Following the FSAP and its recommendation to enhance the toolkit further, powers to carry out bail-in within resolution and to temporarily stay the exercise of early termination rights were added under the 2017 Resolution Reforms (see Box 4 above).

Under the 2017 Resolution Reforms, MAS will have the power to write-down, or convert into equity, unsecured subordinated debt, unsecured subordinated loans, contingent convertible instruments and contractual bail-in instruments, but not other unsecured and uninsured creditor claims (e.g. senior unsecured debt). This power may be exercised while the bank remains open, allowing for a combined strategy of recapitalisation through bail-in and sale to, or merger with, an acquiring institution, potentially together with other measures such as asset transfers. MAS will have discretion to depart from the statutory creditor hierarchy, for example to maximise value in the interest of all creditors as a group or if deemed in the public interest. The ability of MAS to depart from the creditor hierarchy is supplemented by the NCWOL safeguard (see Box 4 for further information).

In addition, MAS is working on separate reforms aimed at the insurance sector including regulations to support the implementation of the 2017 Resolution Reforms. This covers the application of a bail-in regime for the insurance sector and the use of temporary stay powers for reinsurance contracts. The current resolution regime already includes specific powers to: undertake a transfer of insurance contracts; administer existing insurance contracts and fulfil obligations; and restructure policy liabilities of insurance companies to allocate losses to policyholders upon the transfer of the insurance business. These powers can be exercised without the need for policyholder consent.

The full range of the resolution toolkit applies to FMIs. The regime does not include sector-specific powers for FMIs, though in the case of CCPs MAS is able to enforce the CCP's rulebook by using its powers to take control of a financial institution.

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[55] AIA Singapore Private Limited., Prudential Assurance Co. Singapore (PTE) Ltd., The Great Eastern Life Assurance Company Ltd., and NTUC Income Insurance Co-Operative Limited.

Box 6: Resolution toolkit and the role of the court

MAS has, or will have following the entry into force of the 2017 Resolution Reforms, the following tools at its disposal in order to resolve a failing financial institution:

(i) Take operational control of a financial institution by replacing senior management or appointing administrators;

(ii) Transfer the assets and liabilities of an institution to a third party or itself establish a bridge financial institution to take over the assets and liabilities of a failed institution, including the transfer or restructuring of a portfolio of insurance policies;

(iii) Cancel the whole or any part of the share capital of an institution if it is not paid up or not covered by available assets and/or requiring an institution to issue new shares to specified subscribers;

(iv) Transfer shares in a financial institution to a third party;

(v) Write-down, or convert into equity, unsecured subordinated debt, unsecured subordinated loans, contingent convertible instruments and contractual bail-in instruments (under the 2017 Resolution Reforms);

(vi) Impose a temporary stay on the termination rights of counterparties to financial and non-financial contracts entered into with a financial institution that has entered resolution (under the 2017 Resolution Reforms);

(vii) Impose a moratorium over an institution (e.g. to prevent asset disposals or payment outflows or to prohibit the commencement of legal proceedings), subject to an order of the Singapore High Court;

(viii) Order the wind down of an institution, subject to an order of the Singapore High Court; and

(ix) Recover monies from responsible persons ("claw back"), specifically directors and executive officers, subject to an order of the Singapore High Court.

The above resolution tools do not require the consent of the failing institution's shareholders or creditors, although certain actions will necessarily depend on timely involvement of third parties, e.g. transferees of shares or assets.

The powers referred to under items (vii) to (ix) above are subject to court approval. These powers are not considered by MAS as relevant for resolving systemically important firms. Approval proceedings may typically take a couple of days for item (vii) to a couple of months for item (viii), but may be expedited if necessary.

While courts may reverse resolution actions, the grounds to do so are limited to cases where MAS has acted outside of its scope of authority (ultra vires) or disregarded the principles of natural justice. Such a ruling has not been made to date.

Resolution funding: The FSAP recommended authorising the use of the SDIC's deposit insurance fund (DI Fund) to provide support, on a least-cost basis, for the transfer of deposit liabilities to a bridge bank or healthy institution. In line with that recommendation, the 2017 Resolution Reforms will expand the use of the DI Fund to include the funding for the transfer of deposit liabilities to a bridge bank or healthy institution as part of a resolution; this is subject to an "equivalent cost" criterion that the amount of support should be limited to what would have been paid out in a depositor payout. The size of the DI Fund is currently around 250 million Singapore dollars (SGD); SDIC also has access to a liquidity facility with MAS. As regards the insurance sector, the policy owners' protection scheme may already be used to fund the transfer of business from a failed scheme member to another insurer or to fund the run-off of the insurance business of a failed scheme member.

The 2017 Resolution Reforms will further establish a resolution fund that will complement the current DI Fund and policy owners' protection schemes Funds. Given the relatively small size of the DI Fund, MAS envisages that the resolution fund would be the primary source of temporary funding (if needed) for the resolution of SIFIs. A trustee will be appointed to operate the resolution fund.

The resolution fund will be available for more general resolution purposes, such as to:

- recapitalise an institution in resolution or to otherwise provide capital support (subject to prior loss absorption);
- establish temporary public ownership of a financial institution in resolution;
- meet operating costs of a bridge or designated asset management entity, including interest, administrative, servicing, or valuation costs;
- fund creditor compensation claims, including in the resolution of a foreign group in respect of its Singapore entity; and
- fund loss-sharing arrangements with acquiring financial institutions.

The resolution fund may only be used after losses have been imposed on shareholders and holders of subordinated debt to the fullest extent possible or appropriate, though the law does not require equity and bail-inable liabilities to be fully written off. As senior debt is exempt from the scope of the proposed bail-in regime, the resolution fund may have to be tapped in situations when losses and resolution costs exceed the capital and subordinated debt of the resolution entity.

MAS intends to finance the resolution fund, if and to the extent it needs to be used, via a central bank liquidity facility. MAS discussed the possibility of establishing an ex ante funded resolution fund but considered this would be inefficient and could risk creating market expectations that the fund would always be available. The 2017 Resolution Reforms do not prescribe a limit on the liquidity facility that MAS may provide to the resolution fund. If it is used, MAS intends to recoup any losses incurred through the imposition of ex post levies on the industry.[56] This provision seeks to address the FSAP recommendation that the banking industry adequately contribute to the costs of bank failures. Contributions will be calculated on a sectoral basis (i.e. banks would be subject to the levy if the fund was used for the resolution

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[56] See the *MAS Approach to Resolution of Financial Institutions in Singapore* (August 2017, http://www.mas.gov.sg/News-and-Publications/Monographs-and-Information-Papers/2017/MAS-Approach-to-Resolution-of-Financial-Institutions-in-Singapore.aspx) and the *Second Reading Speech of the Monetary Authority of Singapore (Amendment) Act 2017* that was delivered to Parliament during the vote of the 2017 Reform (July 2017, http://www.mas.gov.sg/News-and-Publications/Speeches-and-Monetary-Policy-Statements/Speeches/2017/Monetary-Authority-of-Singapore-Amendment-Bill.aspx). Although the text of the approved law says that MAS "may direct the trustee of the resolution fund to recover the sum" from the industry, MAS notes that it is bound by the second reading speech of the Monetary Authority of Singapore (Amendment) Bill 2017 which states that "Withdrawals from the resolution fund will subsequently be recovered from the industry via ex-post levies".

of a bank). The manner in which the levies is to be determined and the mechanics of the fund will be prescribed in regulations.

Cross-border cooperation and information sharing: Cross-border cooperation is an important component of the bank resolution and crisis management framework in Singapore, given the large presence of foreign banks and Singapore's interconnectedness with the global economy. MAS is authorised under the MAS Act to share information with foreign resolution authorities. MAS already has several MoUs with foreign authorities for information sharing and mutual cooperation, though the majority of them do not specifically address resolution. MAS has therefore initiated negotiations with resolution authorities to include resolution-related clauses into new MoUs. In addition, MAS participates in the Crisis Management Groups (CMGs) for six G-SIBs, as well as the regional CMGs for a further three G-SIBs.

The FSAP recommended that the Singaporean authorities further facilitate cross-border cooperation in bank resolution. Specifically, it noted that the resolution regime accords preference to domestic depositors, which could undermine the scope for coordinated responses in the event of stress (e.g. by encouraging ring-fencing measures in host jurisdictions). Although no measures have been proposed to address the issue of deposit preference, the authorities note that progress has been made to further facilitate cross-border cooperation. In particular, the 2017 Resolution Reforms introduce a new statutory framework for cross-border recognition, under which MAS may recognise, fully or in part, the resolution action of a foreign resolution authority, provided it is satisfied that such action would not:

(i) have a widespread adverse effect on the financial system;

(ii) result in inequitable treatment of any Singapore creditor;

(iii) be contrary to the national interest or public interest;

(iv) have material fiscal implications; or

(v) be against any other condition prescribed by regulations.

The recognition process must be initiated by a formal request to MAS from the foreign jurisdiction, and MAS' decision to recognise fully (or in part) the resolution action is subject to the approval of the Minister-in-Charge. A formal reciprocity requirement does not exist.

Lessons learned and issues to be addressed

The authorities have made good progress in developing the resolution framework in Singapore to address the FSAP recommendations. The regime incorporates many of the elements found in the *Key Attributes* and has a broad scope covering all financial institutions as well as the holding companies of such institutions. The 2017 Resolution Reforms introduced additional elements of the *Key Attributes*, including a power to impose a temporary stay on the exercise of early termination rights, a framework for the cross-border recognition of foreign resolution actions and resolution funding arrangements. The reforms to the regime also include related amendments to the Deposit Insurance and Policy Owners' Protection Schemes Act, to expand the use of the SDIC DI Fund to include the funding of the resolution of DI scheme members. Good progress has also been made in recovery and resolution planning for all local D-SIBs, and the 2017 Resolution Reforms formalise existing supervisory rules for recovery and resolution planning. With the implementation of these reforms, Singapore has a resolution regime broadly in line with the *Key Attributes*.

Notwithstanding this progress, further work is needed to fully align the resolution framework with the *Key Attributes* and its objectives, and to ensure that the framework can be applied in practice. This includes: extending the scope of bail-in and further clarifying loss allocation and ex post recovery of resolution funding; balancing supervision and resolution perspectives; and continuing work to refine, expand and operationalise the resolution planning framework.

Funding of resolution actions: The 2017 Resolution Reforms introduce a statutory bail-in power. However, the scope of liabilities subject to the bail-in power is limited to unsecured subordinated debt and loans, contingent convertible instruments and contractual bail-in instruments, and does not extend to other unsecured and uninsured creditor claims (e.g. senior debt liabilities). Exempting senior debt liabilities reduces the availability of loss-absorbing resources to the authorities to the authorities in resolution and may limit the effectiveness of the bail-in regime. It is therefore not fully aligned with the objective of the *Key Attributes* to ensure that authorities have the capacity to allocate losses to shareholders and creditors in accordance with the creditor hierarchy, which is intended to create a market discipline effect and reduce the risk of moral hazard. It is also inconsistent with the premise that bail-in should facilitate a creditor-financed recapitalisation. The scope of bail-in in all other FSB jurisdictions with a statutory bail-in power extends to senior debt liabilities (with flexibility to apply discretionary exclusions in certain cases),[57] on the basis that resolution authorities should have the power to write down and convert into equity unsecured and uninsured creditor claims.[58] Some of those jurisdictions have also introduced, or are considering, minimum loss absorbency requirements to ensure that there are sufficient resources that can be bailed-in given the liability structure of their banks.

MAS is of the view that extending the scope of bail-in to other unsecured and uninsured creditor claims is not practicable or desirable as it increases risk of contagion to the financial system and creates uncertainty. MAS notes that there is a wide variety of liabilities within the senior debt class, including liabilities owed to service providers and payment systems. Uncertainty over the bail-in of such operational liabilities can cause disruption to the provision of critical functions and services in a crisis. Including only some senior liabilities within the bail-in scope and not others is also not desirable as it would be inconsistent with creditor hierarchy, and could hence result in heightened risk of legal challenge and compensation cost under the NCWOL safeguard. MAS considers that it is more important to be clear ex ante on the liabilities that would be subject to bail-in to provide certainty and clarity to the market. In addition, MAS notes that bail-in is only one of the tools in its resolution toolkit, and that its use should be balanced against an expected increase in uncertainty to the banks, their costs of

[57] See, for example, Article 44.3 of the European Union's Bank Recovery and Resolution Directive for a list of the "exceptional circumstances" under which discretionary exclusions may be made in the resolution regime (http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014L0059&from=EN).

[58] Annex 1 of the FSB's July 2017 *Sixth Report on the Implementation of Resolution Reforms* (ibid) shows that bail-in powers are available in ten FSB jurisdictions (Canada, France, Germany, Hong Kong, Italy, Netherlands, Spain, Switzerland, United Kingdom and United States); in all cases, these powers extend to unsecured and uninsured creditor claims (including senior debt liabilities).

funding, and overall impact on the efficiency of the economy. MAS also notes that D-SIBs are subject to higher prudential requirements than the Basel framework, and that their capital adequacy and leverage ratios are in excess of the minimum regulatory requirements.[59] MAS hence intends to rely on regulatory capital instruments (including contingent convertible or contractual bail-in instruments) as the primary form of loss-absorbing capacity for these banks.

An increase in bank funding costs for unsecured and uninsured creditor claims in jurisdictions where such liabilities are within the scope of bail-in reflects the reforms' objective to address the risk of banks being too-big-to-fail and to remove the implicit subsidy arising from market perceptions of government support for large banks. Affecting market expectations helps reduce the risk of moral hazard and ensure that SIFIs internalise the systemic risks to which they give rise.

The legal risk of NCWOL claims and potential contagion risks that could arise from the application of bail-in powers can be mitigated through actions such as changes to the creditor hierarchy, the use of holding company structures (combined with the adoption of single point of entry strategies that provide for entry into resolution at holding company level) and through statutory exclusions from the scope of bail-in.[60] Moreover, the risk of contagion within the financial system should a firm enter resolution can be mitigated, at least in part, by regulations that limit banks' investment in bail-inable instruments and liabilities.[61] More broadly, the ability of the authorities to impose losses on the holders of bail-inable instruments and liabilities should motivate those holders to evaluate the risks of, and their exposure to, a potential bail-in. Bail-in powers thus have a disciplinary effect on the market, and may result in risks being assumed by those most able to bear loss.

As noted above, extending the scope of bail-in to include senior debt would increase the amount of bail-inable resources available to absorb losses, and thereby help achieve an orderly resolution and reduce potential resolution costs. This is important given that regulatory capital may no longer be available to absorb losses at the point of entry into resolution. In such a case, MAS would have to provide temporary public funding through the resolution fund to support timely implementation of resolution measures, especially given the limited amount of ex ante funds available in the DI Fund. The size of bail-in able resources is particularly important for Singapore given the size of its financial system assets (around nine times Gross Domestic Product (GDP)), including of the three local banking groups designated as D-SIBs (combined assets of three times GDP).

The authorities have stated in public communications – such as the MAS monograph setting out the approach to resolution and in the second parliamentary reading on the 2017 Resolution Reforms – that they do not aim to establish a 'zero failure' regime and that any costs incurred

[59] Minimum capital requirements for D-SIBs in Singapore are 2% higher than the Basel III framework, while their current leverage ratios are comparable or in excess of the requirements established under the Total Loss-Absorbing Capacity (TLAC) standard (i.e. 6.75% of the Basel III leverage ratio denominator).

[60] For example, in Germany the creditor hierarchy was amended to subordinate unsecured senior debt to other senior claims; in the UK and US certain firms will be required to issue bail-inable liabilities through non-operating holding companies to provide structural subordination; and in Hong Kong certain liabilities (such as those arising from participation in designated clearing and settlement systems and those owed to a creditor arising from the provision of goods and services) are statutorily excluded from the scope of bail-in.

[61] See, for example, the BCBS standard on TLAC holdings (http://www.bis.org/bcbs/publ/d387.htm).

in the resolution of a firm will be recovered via contributions from that firm's sector. In spite of this, however, some market participants (e.g. credit rating agencies) have maintained expectations of sovereign support for Singapore banks even after the recent enhancements to the resolution regime, citing the limited scope of bail-in as well as the concentrated nature of the banking system, the banks' role in the economy, and Singapore's fiscal strength.

As the authorities continue their work to implement the resolution framework, they should take steps to minimise the risk of public support. This includes extending the scope of bail-in to include senior liabilities and promulgating regulations on loss allocation and mandatory ex post recovery of resolution funding.

- ***Recommendation 3**: The authorities should further strengthen the resolution framework to minimise the risk of public support by: (a) extending the scope of bail-in to include senior debt; and (b) promulgating regulations to further clarify loss allocation and the mandatory mechanism for ex post recovery from the industry of resolution funding.*

Balancing supervision and resolution perspectives: MAS does not have a dedicated resolution unit, and relies instead on subject matter experts within the supervisory teams to conduct such work (including the development of resolution plans) in consultation with a resolution working group. This group, which comprises representatives from various departments (including policy, legal and supervision) involved in resolution issues in addition to their other day-to-day responsibilities, is overseen by a member of MAS' senior management outside of line supervision (but reporting to the Deputy Managing Director for Financial Supervision). MAS takes the view that this structure leverages on the institutional knowledge of supervisors, allows for an objective challenge from the resolution working group, and that a strict organisational separation of those two functions risks creating silos and a duplication of resources. MAS further notes that resolution actions often require supervisory initiative or approvals (e.g. change of control approvals), and that the current structure allows MAS to act promptly at an early stage and to exploit such synergies.

The *Key Attributes* require the resolution authority to have adequate expertise, resources and operational capacity to perform its functions. This does not necessarily mean organisational separation of supervision and resolution, although several FSB jurisdictions have adopted this approach.[62] However, it is essential to develop specialised resolution expertise and fora that allow staff supporting resolution-related activities to interact and share knowledge and views on an ongoing basis. In terms of governance, resolvability actions and resolution decisions – in particular as regards entry into resolution – should be informed by senior technical expertise in resolution matters, with a reporting line distinct from the supervision line, to provide a balance between supervisory and resolution interests.

Having resolution work undertaken by supervisory teams may create the potential for delay concerning resolution decisions. MAS notes that the risk of forbearance is mitigated by the balancing of supervisory judgment with independent and data-driven input from MAS'

[62] For example, in the United Kingdom a separate resolution function has been established in the Bank of England with a reporting line to the Deputy Governor for Financial Stability, while in Hong Kong and Switzerland separate resolution divisions have been established in the Hong Kong Monetary Authority and Swiss Financial Market and Supervisory Authority, respectively, both of which report directly to the Chief Executive.

analytical unit (SMTA). Breaches of monitoring triggers are escalated by SMTA to MBRC directly, who can weigh supervisory and resolution interests in reaching decisions on the appropriate response. In addition, resolution plans and resolvability assessments are approved by the MBRC. However, this does not fully negate the risk of forbearance as decisions on resolvability may create tension with actions taken by the supervisory authorities (e.g. requirements on loss absorbing capacity may affect firms' capital and funding structures and risk profiles). In this respect, MAS' structure may not provide a sufficient platform for resolution objectives to be fully taken into account. Such risks may be avoided or mitigated if a member of MAS' senior management is explicitly tasked with championing the resolution viewpoint and concerns – both from a policy and operational perspective – in internal fora.

- ***Recommendation 4**: MAS should take steps to balance supervision and resolution perspectives by: (a) establishing a resolution hub to bring together staff in supervisory and other teams responsible for supporting resolution-related activities; (b) ensuring that the hub has regular access to senior management, e.g. through a separate reporting line; and (c) tasking a member of MAS senior management outside of line supervision with responsibility to champion the resolution perspective.*

Refining, extending and operationalising resolution planning work: It is important for MAS to continue to develop the resolution framework in order to make it operational and to ensure that firms are resolvable. One such step involves further work on resolution planning. MAS is currently in its second iteration of resolution planning for local D-SIBs. MAS should refine resolution strategies and plans for D-SIBs in light of the new resolution tools in the MAS Act and continue efforts to enhance cooperation with foreign authorities. This is relevant both for local banks that have grown fast through regional expansion in recent years and for G-SIBs, particularly where MAS participates in the CMG as a host authority. This includes signing MoUs with foreign resolution authorities and refining resolution strategies and plans for local D-SIBs to reflect the availability and potential application of new resolution tools.

As part of the development of resolution strategies and plans, MAS should continue to conduct resolvability assessments and take steps to address identified barriers to resolvability. Such barriers may be of a structural nature, but may also relate to resolution strategies that involve the application of new resolution powers and existing tools (e.g. wind down). For example, a resolution strategy that combines bail-in, transfer of assets to an acquiring party, and the wind-down of residual assets and liabilities may depend on timely court approval for the wind-down. Assessing the operational implementation of resolution strategies is an important element of resolution planning and will increase MAS' preparedness if an actual resolution case occurs.

Finally, given the cross-sectoral scope of the regime, it is important for MAS to extend resolution planning to insurance companies and FMIs that could be systemic in failure. As part of this work, MAS should consider whether sector-specific adaptations to the regime are required to implement resolution strategies and plans for these types of entities.

- ***Recommendation 5**: MAS should continue to develop the resolution planning framework by: (a) refining resolution strategies and operationalising resolution plans, particularly for local D-SIBs; (b) addressing barriers to resolvability; and (c) developing sector-specific adaptations to resolution planning and resolution strategies for insurance companies and FMIs that could be systemic in failure.*

Annex 1: Structure of the financial system and recent developments[63]

Financial system structure

The financial system in Singapore comprises primarily banks, insurance companies and capital market services licensees. MAS exercises integrated oversight of around 3,000 financial institutions. The system is dominated by banks, which made up 65% of total financial system assets as of end-2016.

Structure of the banking sector

As of Q2 2017, there were 128 commercial banks with operations in Singapore, with total assets of SGD 2,418 billion. They engage in a wide range of financial services, including traditional banking activities such as lending and deposit taking, investment banking, as well as corporate finance and fund management.

There are two categories of commercial banks: full banks and wholesale banks (Table 1). The former transact in a broad range of personal and corporate banking businesses, including the operation of current, savings and fixed deposit accounts, financing of exports and imports, transfer of funds, commercial letters of credit, trust receipts, traveller's cheques and currencies. Full banks may also provide advice on trade and investment, foreign exchange, and may furnish credit reports and trade information. In addition, most full banks offer the full range of retail payment services such as cheque services, fund transfers, issuance of credit and debit cards, as well as automated teller machine services. Wholesale banks engage in the same range of banking business as full banks, but do not carry out Singapore Dollar retail banking activities.

Table 1: Categories of commercial banks in Singapore

Commercial Banks	**128**
Local banks[64]	5
Foreign banks	123
Foreign full banks	29
Wholesale banks[65]	94

In April 2015, MAS announced its framework for identifying and supervising D-SIBs in Singapore. D-SIBs are banks that are assessed to have a significant impact on the stability of the financial system and proper functioning of the broader economy, based on their size, interconnectedness, substitutability and complexity. This framework builds on MAS' existing

[63] Based on information provided by the Singaporean authorities.

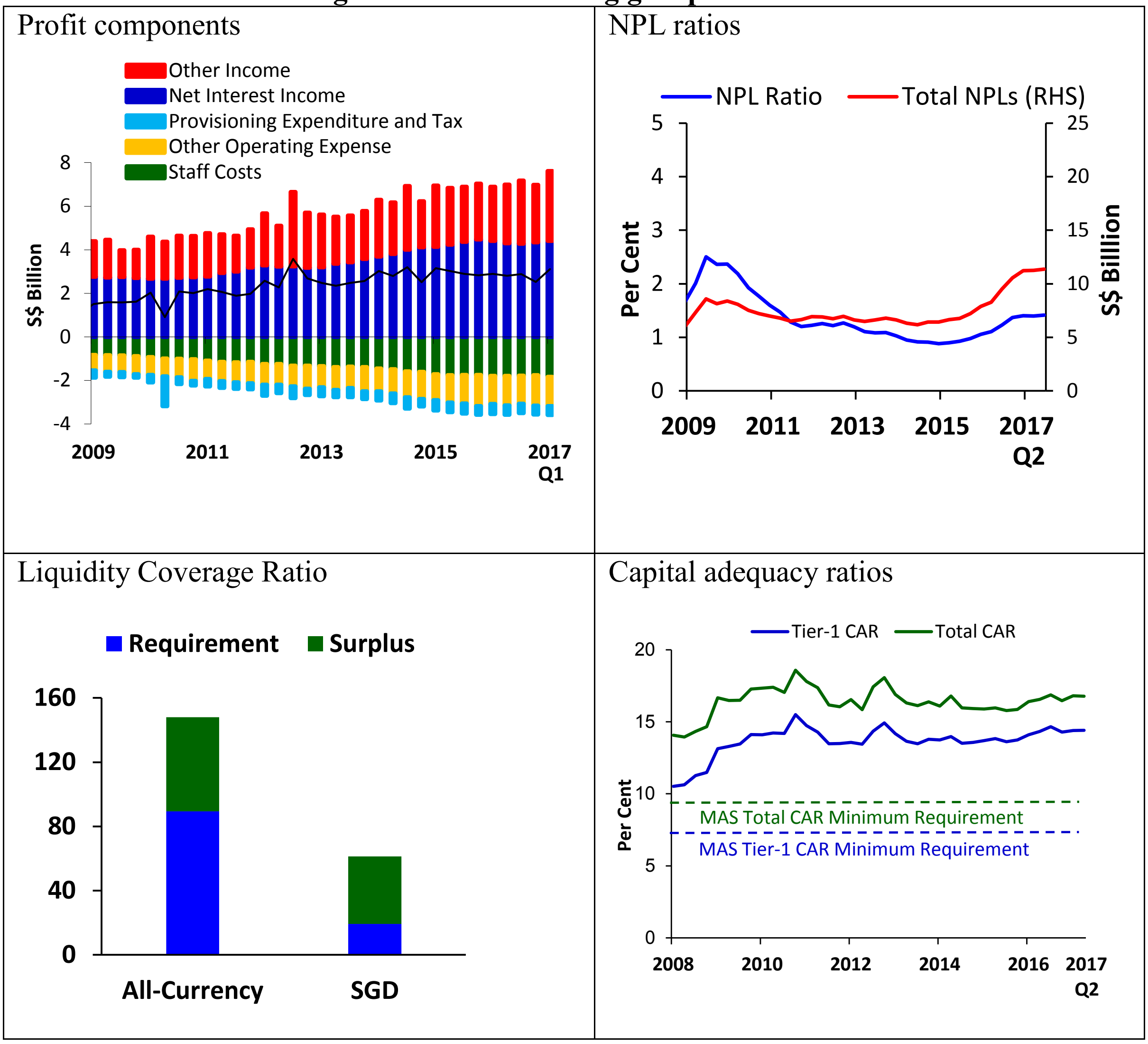
[64] These five local banks belong to three domestic banking groups: DBS Bank, Oversea-Chinese Banking Corporation and United Overseas Bank. Oversea-Chinese Banking Corporation owns Bank of Singapore, while United Overseas Bank owns Far Eastern Bank.

[65] This includes existing offshore banks. MAS has streamlined the bank licensing framework by phasing out the offshore bank license. All existing offshore banks will be converted to wholesale banks over time.

supervisory impact assessment methodology, and is aligned with the principles set out by the BCBS for determining banks that are of domestic systemic importance.

D-SIBs are subject to additional regulatory requirements.[66] These include local incorporation of retail operations for foreign banks with significant retail operations, recovery and resolution planning obligations, and liquidity coverage ratio requirements. Locally-incorporated D-SIBs will also need to meet higher capital requirements – a minimum Common Equity Tier 1 (CET1) capital adequacy ratio (CAR) of 6.5%, Tier 1 CAR of 8% and Total CAR of 10%, as compared with the Basel III minimum requirements of 4.5%, 6% and 8% respectively.

Figure 1: Local banking group indicators



[66] The banking groups designated as D-SIBs are: DBS Bank, Oversea-Chinese Banking Corporation, United Overseas Bank, Citibank, Malayan Banking Berhad, Standard Chartered Bank and The Hongkong and Shanghai Banking Corporation.

Local banking groups

The three local banking groups saw non-bank lending growth of 8.1% year-on-year (y-o-y) in Q2 2017. Resident lending rose 5.4% y-o-y in Q2 2017. Earnings are supported by stable net interest margins (1.7% in Q2 2017). NPL ratios were 1.4% in Q2 2017 (below the 2.1% average for the banking sector as a whole), with provisioning coverage ratio at 247%. The local banks' capital and liquidity positions are well above regulatory requirements (Figure 1).

Insurance sector

The number of insurers operating in Singapore increased from 164 in 2012 to 189 as at end-2016, largely attributable to the increase of non-life insurers. Total assets[67] of the life insurers grew to SGD 177 billion as at end-2016, representing an average growth rate of 7% since 2012. Annual growth rate of non-life business was 4% since 2012, with the total gross premium written in 2016 amounting to SGD 13 billion. Both the life and non-life insurance sectors have been profitable since 2012, with net income and underwriting profits of SGD 1.6 billion and SGD 524 million respectively in 2016.

There have been no significant changes to the market structure and key product lines. The life sector continues to be dominated by the top four direct life insurers, which together account for more than 75% of the industry assets. In terms of products, life insurers continue to focus on products with saving features, such as endowment and whole life policies. In the non-life[68] insurance sector, property and motor remained the dominant lines of business. A notable development in the market is that insurers are moving towards greater use of technology to serve their customers. For example, life insurers are offering life insurance products online, and general insurers are using telematics to offer usage-based insurance.

Capital markets

In Singapore, the securities and derivatives exchanges are operated by the Singapore Exchange (SGX) and ICE Singapore. In addition to supervision of the exchanges, MAS also supervises about 1,000 capital market intermediaries. These include securities and derivatives brokers, fund managers, REIT managers, corporate finance advisers, financial advisers, insurance brokers, credit rating agencies, and trust companies. Capital markets intermediaries are subject to capital and business conduct requirements to promote financial soundness and fair-dealing.

Trading of listed equities and debt securities are done on SGX Securities Trading (SGX-ST) and trades are cleared with the Central Depository (CDP). Derivatives traded on SGX-Derivatives Trading (SGX-DT) are cleared by the Singapore Exchange Derivatives Clearing (SGX-DC). SGX-DC also clears OTC derivatives. In 2016, the market capitalisation of equities listed on SGX-ST was about SGD 926 billion, while 173 million contracts were cleared on SGX-DC. ICE started operations as a derivatives exchange in Singapore at end-2015. ICE Clear Singapore clears derivatives traded on the ICE Futures Singapore exchange. Trading volume on ICE was about 2 million contracts in 2016.

67 The figure excludes assets in the shareholder fund as well as assets relating to global business operations.

68 Non-life insurance sector includes both direct general insurers and reinsurers.

In terms of trade reporting infrastructure, the DTCC Data Repository Singapore (DDRS) operates a trade repository for market participants to meet their reporting obligations for OTC derivatives.

There have been significant changes to MAS' regulatory regime for the capital markets in the past few years, particularly with regard to OTC derivatives transactions. Legislative amendments have been passed in the Singapore Parliament to bring financial market infrastructure for the trading, clearing and reporting of OTC derivatives transactions within scope of the Securities and Futures Act. MAS has also published guidelines on margin requirements for non-centrally cleared OTC derivatives.

Regulatory framework

The MAS' mission is to promote sustained non-inflationary economic growth, as well as foster a sound and progressive financial centre. The MAS' functions are:

- To act as the central bank of Singapore, including the conduct of monetary policy, the issuance of currency, the oversight of payment systems and serving as banker to and financial agent of the Government.
- To conduct integrated supervision of financial services and financial stability surveillance.
- To manage the official foreign reserves of Singapore.
- To develop Singapore as an international financial centre.

MAS is governed by the Monetary Authority of Singapore Act, which confers MAS powers to issue legal instruments for the regulation and supervision of financial institutions. In addition, MAS has frameworks and guidelines in place on topics that cut across various classes of financial institutions.

In carrying out its functions as a regulator of the financial services industry, MAS issues various instruments under Acts administered by MAS. The following classification of instruments issued by MAS is adopted:

(1) Acts

The Acts contain statutory laws under the purview of MAS which are passed by Parliament. These have the force of law and are published in the Government Gazette. Examples are the Banking Act and Financial Advisers Act.

(2) Subsidiary Legislation

Subsidiary legislation is issued under the authority of the relevant Acts and typically fleshes out the scope of the provisions of the primary Act and spells out in greater detail the requirements that financial institutions or other specified persons (e.g. a financial adviser's representative) have to adhere to. Subsidiary legislation has the force of law and may specify that a contravention is a criminal offence. The subsidiary legislation will also specify the maximum penalty for a contravention of that subsidiary legislation. They are also published in the Government Gazette. Examples are the Insurance (Actuaries) Regulations 2013 and Finance Companies (Advertisements) Regulations.

(3) Directions

Directions detail specific instructions to financial institutions to ensure compliance. They have legal effect, meaning that MAS could specify whether a contravention of a direction is a criminal offence. It will usually specify the maximum penalty for a contravention of the direction.

Directions consist of the following:

(a) Directives - Directives primarily impose legally binding requirements on an individual financial institution.

(b) Notices - Notices primarily impose legally binding requirements on a class of financial institutions. Examples are the MAS Notice 636 (Notice to Banks on Branches, Place of Business and Automated Teller Machines) and MAS Notice 307 (Notice to Life Insurers on Investment-linked Life Insurance Policies).

(4) Guidelines

Guidelines set out principles or "best practice standards" that govern the conduct of a financial institution. While contravention of guidelines is not a criminal offence and does not attract civil penalties, the degree of observance with guidelines by a financial institution may have an impact on MAS' overall risk assessment of that institution. Examples are the Technology Risk Management Guidelines for Financial Institutions and Guidelines on Standards of Conduct for Marketing and Distribution Activities for Insurance Brokers.

(5) Codes

Codes set out a system of rules governing the conduct of certain specified activities. Codes are non-statutory and do not have the force of law. However, a breach of a Code may attract certain non-statutory sanctions like private reprimand or public censure. There is currently a Code on Take-overs and Mergers (which is administered by the Securities Industry Council), a Code on Collective Investment Schemes and a Code of Conduct for Credit Rating Agencies.

(6) Practice Notes

Practice Notes provide guidance on administrative procedures relating to, among others, licensing, reporting and compliance matters. Contravention of a practice note is not a criminal offence, unless a procedure stated in the practice note is also required by an Act or regulation. An example is the Lodgment Practice Note for Shares and Debentures.

(7) Circulars

Circulars are informative in nature and have no legal effect. They may be sent to financial institutions or published on the MAS website for public information. An example is the MAS Circular to Banks on Outsourcing of Cash And Cheque-Related Transactional Services to Another Bank.

(8) Policy Statements

Policy statements outline broadly the major policies of MAS. An example is the National Policy Statement on Anti-Money Laundering/Countering the Financing of Terrorism.

Recent regulatory initiatives

For the banking sector, MAS is in the process of implementing the remaining Basel III standards, which include the Fundamental Review of the Trading Book for market risk, Interest rate Risk in the Banking Book, Securitisation, Leverage Ratio, Large Exposures and TLAC holdings.

For the insurance sector, MAS is in the process of reviewing the Risk-Based Capital framework to enhance the risk sensitivity and coverage of this framework in line with international standards and best practices. The review seeks to ensure that the framework for assessing capital adequacy is more aligned to an insurer's business activities and risk profiles.

As part of the implementation of the G20 OTC derivative reforms, MAS is also working to finalise regulations for mandatory clearing requirements in Q4 2017, for planned commencement in mid-2018.

Annex 2: Singapore's use of macroprudential policies to address risks in the housing sector

Background

The property market in Singapore is dominated by public housing, which accounts for 73% of the total housing stock as at end 2016.[69] Public housing consists of apartments built by the Housing and Development Board (HDB) and sold to eligible Singaporean citizens at subsidised prices. HDB apartments can only be resold after a minimum occupancy period of five years to other eligible citizens or Singapore permanent residents. The HDB provide loans to buyers in both the primary and secondary market for HDB apartments, with a flat interest rate of 2.6% (0.1% above the Central Provident Fund's[70] (CPF) Ordinary Account Interest Rate).

In contrast, private residential properties are built and sold by developers, with the land supply from the Government Land Sales programme administered by the Urban Redevelopment Authority (URA) or private land sources. Compared to public housing, private residential properties are typically more expensive and considered as an 'upgrade'. Nonetheless, there is a certain degree of substitution between the secondary markets for public and private housing, and house price movements in the two markets are positively correlated. Banks can provide mortgage loans against both public and private properties, but the majority of banks' mortgage loans are for private housing purchases.

Risks identified

The housing market plays an important role in Singapore's economy, as property holdings account for over half of household assets. Following the global financial crisis, as the economy began to recover and global interest rates eased, prices of private residential properties in Singapore started to pick up significantly.[71] According to the URA, between Q2 2009 and Q2 2011 the private property price index increased by a total of 52%. The share of foreign buyers in the private housing market has also increased significantly in the meantime. In the resale market for public housing, prices grew by 29% over the same period, according to the HDB.

At the same time, housing loan growth rose rapidly, averaging around 20% on a year-on-year basis in 2010.[72] Although more than 70% of housing loans are for owner-occupied residential properties that tend to have a lower risk profile, the share of outstanding loans with LTV above 80% rose from 8% in December 2008 to 17% in September 2009. Driven by the strong growth in housing

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69 See https://www.mnd.gov.sg/newsroom/news-page/oral-answer-by-ministry-of-national-development-on-proportion-of-different-dwelling-units-in-singapore.

70 The CPF is a mandatory social security savings scheme funded by contributions from employers and employees.

71 See http://www.seacen.org/products/702003-100372-PDF.pdf.

72 See the 2010 FSR (http://www.mas.gov.sg/Regulations-and-Financial-Stability/Financial-Stability/2010/Financial-Stability-Review-2010.aspx).

loans, the household debt-to-GDP ratio increased sharply, from 67% in 2007 to 72% in 2009 and 76% in 2012.

The authorities were concerned that the low interest rate environment and speculation may have played a role in the housing market boom between 2009 and 2013, and that if economic growth turned out to be weaker than expected or when interest rates rose to higher levels, it could lead to a correction in house prices with severe consequences for financial stability and the real economy.

Objectives and design of the policy measures

In order to mitigate risks in the property market, MAS introduced a number of credit-based macroprudential tools since 2009, including tighter LTV ratios, TDSR framework, and loan tenure limits (see Table 2-1 for details), which apply to banks and finance companies for housing transactions.[73] These were complemented by fiscal and land supply measures implemented by other government authorities (see Table 1 in section 2). The use of several complementary measures to mitigate risks in the property market was intended to enhance their effectiveness. For example, the TDSR would not have been as effective without the loan tenure limit, since borrowers could have stretched their loan tenure to reduce the monthly repayments. In addition, the policy measures have been implemented in incremental steps to leave room for potential adjustments, and informed by micro-prudential risk assessments.

MAS' first action to address risks in the housing market was as early as September 2009, when house prices started to rise. Jointly with other government authorities, MAS announced that interest-only housing loans, as well as interest absorption schemes (loans in which the developer absorbed interest payments on behalf of the borrower for a period of time), were disallowed.

The LTV limit was first introduced in 1996 (at 80%) during a property market upswing,[74] and was later raised to 90% in 2005. In February 2010, MAS decided to lower the LTV limit to 80% to encourage greater financial prudence among property purchasers. Further announcements were made in the following years to lower the LTV limits for borrowers with multiple housing loans and non-individuals. At the same time, the government introduced a seller's stamp duty (SSD) to discourage speculative activities. This was followed by an additional buyer's stamp duty (ABSD) in December 2011 targeted at risks arising from certain buyer segments, i.e. non-resident purchases and residents purchasing multiple-homes.

Housing loan growth remained strong in 2010/2011 and bank supervisors observed that housing loan tenures were trending upwards, while a thematic review revealed uneven practices in lenders' evaluation of debt-service-to-income ratios of mortgage loan applicants. As a result, MAS introduced a limit on maximum loan tenure in October 2012 and a limit on TDSR in June 2013 (see Table 2 for details). The loan tenure limit was set at 35 years, which applies to all loans on

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[73] Although loans granted by HDB are not directly subject to MAS regulations, in practice HDB sets its own policies that are generally in line with the macroprudential measures introduced by MAS.

[74] See http://www.mas.gov.sg/news-and-publications/media-releases/2005/mas-issues-revised-housing-loan-rules.aspx.

residential property. In addition, MAS lowered the LTV limit for loans with tenure greater than 30 years or extending beyond the retirement age. This combination of measures was intended to prevent borrowers from over-estimating their ability to service the loans and overextending themselves.

The new TDSR framework, limiting total debt service payments to 60% of a borrower's income, was designed to ensure that borrowers have adequate income to service their debt in the long term. All outstanding debt obligations, whether property-related or not, would be taken into account when calculating the TDSR.

Table 2-1: Macroprudential policy measures in reverse chronological order

March 2017
• **Revisions to Seller's Stamp Duty (SSD):**
  o Impose SSD on holding periods of up to three years, down from four years previously; and
  o Lower the SSD rate by four percentage points for each tier. The new SSD rates range from 4% (for properties sold in the third year) to 12% (for those sold within the first year).
• **Disapply Total Debt Servicing Ratio (TDSR) framework to mortgage equity withdrawal loans with LTV ratios of 50% and below.** To give borrowers greater flexibility to monetise their properties in their retirement years.
http://www.mas.gov.sg/News-and-Publications/Media-Releases/2017/Joint-Press-Release-on-Measures-Relating-to-Residential-Property.aspx

December 2013 The Mortgage Servicing Ratio (MSR) for housing loans granted by financial institutions for EC units bought directly from property developers is capped at 30% of a borrower's gross monthly income. It discourages EC buyers from over-stretching their finances and supports an affordable and sustainable EC market. https://app.mnd.gov.sg/Newsroom/News-Page/ID/856/year/2013/RA1/RA2/RA3?category=Press%20Release
August 2013 **Revision of Mortgage Loan Terms** • • To ensure financial prudence in purchase of public housing and further stabilise the HDB resale market, maximum tenure for housing loans granted by HDB reduced from 30 years to 25 years and MSR limit reduced from 35% to 30%. • • In tandem, MAS reduced the maximum tenure of new housing loans and re-financing facilities granted by FIs for the purchase of HDB flats from 35 years to 30 years. New loans with tenures exceeding 25 years and up to 30 years will be subject to tighter LTV limits. https://app.mnd.gov.sg/Newsroom/News-Page/ID/842/year/2013/RA1/RA2/RA3?category=Press%20Release http://www.mnd.gov.sg/27082013/AnnexC.pdf
June 2013 **TDSR framework** • Coverage: loans for the purchase of or otherwise secured on all types of property (including refinancing of such loans).

- Methodology:
  - Take into account monthly repayments of all property and non-property debt obligations
  - Apply specified medium-term interest rate (3.5% for residential loans, 4.5% for non-residential loans) or prevailing market rate, whichever is higher
  - Haircut of at least 30% for all variable and rental income
  - Haircuts to and amortisation of value of eligible financial assets by converting them into 'income streams'
- FIs required to verify and obtain relevant documentation on a borrower's debt obligations and income.
- Property loan to not exceed a TDSR threshold of 60%. MAS will monitor and review the threshold over time, with a view to further encouraging financial prudence.

Refinements to existing housing loan rules

- Borrowers named on property loan to be mortgagor of residential property for which the loan is taken.
- "Guarantors" who are standing guarantee for borrowers otherwise assessed by the FI at point of application not to meet the TDSR threshold for a property loan to be brought in as co-borrowers.
- Use of income-weighted average age of borrowers when applying the rules on loan tenure, in the case of joint borrowers.

http://www.mas.gov.sg/News-and-Publications/Media-Releases/2013/MAS-Introduces-Debt-Servicing-Framework-for-Property-Loans.aspx
http://www.mas.gov.sg/~/media/resource/news_room/press_releases/2013/FAQS_on_MAS_Total_Debt_Servicing_Framework_for_Property_Loans_and_Refinements_to_Housing_Loan_Rules.pdf

January 2013
Private Housing

- Additional Buyer's Stamp Duty (ABSD) rates:
  - i. Raised between five and seven percentage points across the board.
  - ii. Imposed on SPRs purchasing their first residential property and on Singapore citizens purchasing their second residential property.

ABSD rates	1st property	2nd property	3rd and subsequent property
Singapore Citizens			
Previous	Nil	Nil	3%
Current	Nil	**7%**	**10%**
SPRs			
Previous	Nil	3%	3%
Current	**5%**	**10%**	**10%**
Foreigners and Non-individuals			
Previous	10%	10%	10%
Current	**15%**	**15%**	**15%**

- LTV limits on housing loans were tightened for individuals who already have at least one outstanding loan, as well as to non-individuals such as companies.

LTV ratios	1st housing loan	2nd housing loan	3rd and subsequent housing loan
Previous	80% or 60%*	60% or 40%*	60% or 40%*
Current	No change	50% or 30%*	40% or 20%*

*For loans where (i) the tenure exceeds 30 years or (ii) the loan period extends beyond the retirement age of 65 years. • Besides tighter LTV limits, the minimum cash down payment for individuals applying for a second or subsequent housing loan was raised from 10% to 25%. http://www.mas.gov.sg/news-and-publications/media-releases/2013/additional-measures-to-ensure-a-stable-and-sustainable-property-market.aspx **Public Housing** • MSR for public housing loans granted by financial institutions was capped at 30% of a borrower's gross monthly income. • For loans granted by HDB, the cap on the MSR was lowered from 40% to 35%.
October 2012 • The new loan tenure rules imposed an absolute limit of 35 years on the tenure of housing loans granted by FIs for the purchase of any residential property. • LTV limit for new housing loans to borrowers who are individuals, if (i) the tenure exceeds 30 years or (ii) the loan period extends beyond the retirement age of 65 years. For these loans, LTV limit was (i) 40% for a borrower with one or more outstanding residential property loans and (ii) 60% for a borrower with no outstanding residential property loan. • The LTV ratio for housing loans to non-individual was lowered from 50% to 40%. http://www.mas.gov.sg/News-and-Publications/Media-Releases/2012/MAS-Restricts-Loan-Tenure-for-Residential-Properties.aspx
December 2011 • Imposition of ABSD on the following categories of residential property purchases: i. 10% for foreigners and corporate entities buying any property; ii. 3% for SPRs owning one and buying a second and subsequent property; and iii. 3% for Singapore citizens owning two and buying a third and subsequent property. http://www.mas.gov.sg/News-and-Publications/Media-Releases/2011/ABSD-for-a-Stable-and-Sustainable-Property-Market.aspx
January 2011 • Holding period for imposition of SSD was increased from three to four years. • SSD rates were raised to 16%, 12%, 8% and 4% for residential properties bought and sold in 1st, 2nd, 3rd and 4th year of purchase respectively. • For property buyers who are individuals with one or more outstanding housing loans: LTV limit for housing loans granted by FIs was lowered from 70% to 60%. • For property buyers who are not individuals: LTV limit was lowered from 70% to 50% for housing loans granted by FIs. http://www.mas.gov.sg/News-and-Publications/Media-Releases/2011/Measures-To-Maintain-A-Stable-And-Sustainable-Property-Market.aspx
August 2010 • Holding period for the imposition of SSD was increased from one to three years. • For property buyers with one or more outstanding housing loans: LTV limit was lowered from 80% to 70% for housing loans granted by FIs and the minimum cash down payment for housing was raised from 5% to 10%. • Minimum period for which a person must occupy his public housing unit before he can sublet or resell the unit was raised.

• Concurrent ownership of both public housing and private properties during the minimum occupation period was disallowed. http://www.mas.gov.sg/News-and-Publications/Media-Releases/2010/Measures-to-Maintain-a-Stable-and-Sustainable-Property-Market.aspx
February 2010 • Imposition of SSD on all residential properties bought and sold within one year. • LTV limit for housing loans was lowered from 90% to 80% for housing loans granted by FIs. http://www.mas.gov.sg/News-and-Publications/Media-Releases/2010/Measures-To-Ensure-a-Stable-and-Sustainable-Property-Market.aspx
September 2009 • Interest-only housing loans and loans in which the developer absorbed interest payments on behalf of the borrower for a period of time were disallowed. http://www.mas.gov.sg/News-and-Publications/Media-Releases/2009/Measures-to-Ensure-a-Stable-and-Sustainable-Property-Market.aspx

Calibration of tools and coordination across authorities

The calibration of the housing macroprudential tools was based on a combination of expert judgement and quantitative analysis, i.e. a "guided discretion" approach. For example, the calibration of LTV limits for borrowers with multiple property loans was supported by analysis of granular data on high-LTV borrowers collected from financial institutions.

Coordination between MAS and other authorities is an important part of the calibration process. This takes place through an inter-agency property market task force, which was set up in 2007 and meets twice a year (and more frequently if necessary). The task force is chaired by the Deputy Secretary (MND) and comprising representatives from MAS, the MOF and the MND. While each authority retains ultimate authority and accountability for its respective tools, the working group provides a platform to discuss potential policy interactions and to coordinate policy measures. For example, given the linkage between the private housing market and the secondary market for public housing, MAS and MND/HDB use the task force to discuss the joint impact of their housing loans-related measures in order to minimise spillover effects.

Communication

Where appropriate, property market measures are announced as a whole package through a joint press release by relevant authorities, to ensure consistency in the messaging and send a strong signal to market participants in the housing market.[75] In the case of the TDSR, the June 2013 press

[75] For example, see http://www.mas.gov.sg/News-and-Publications/Media-Releases/2017/Joint-Press-Release-on-Measures-Relating-to-Residential-Property.aspx

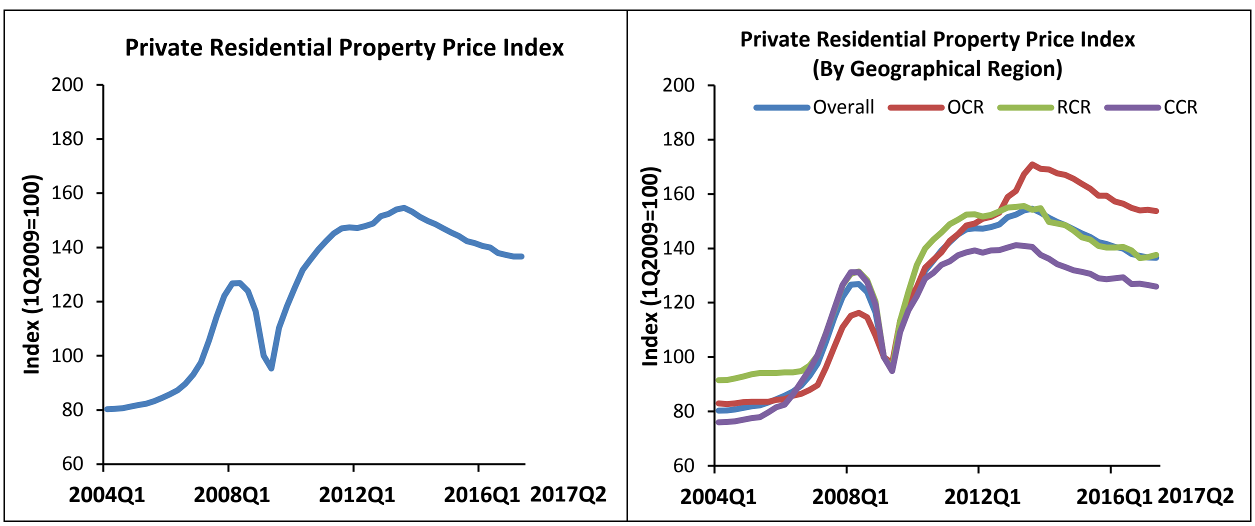
release stated the objectives of the measure and was accompanied with a set of FAQs[76] with more details on the design of the framework and the actual computation of the TDSR. In addition, MAS communicates the considerations and rationale for its macroprudential policy measures using other channels, including regular publications (the FSR and the Annual Report), speeches by MAS' management and responses to parliamentary queries.

Effectiveness of policies

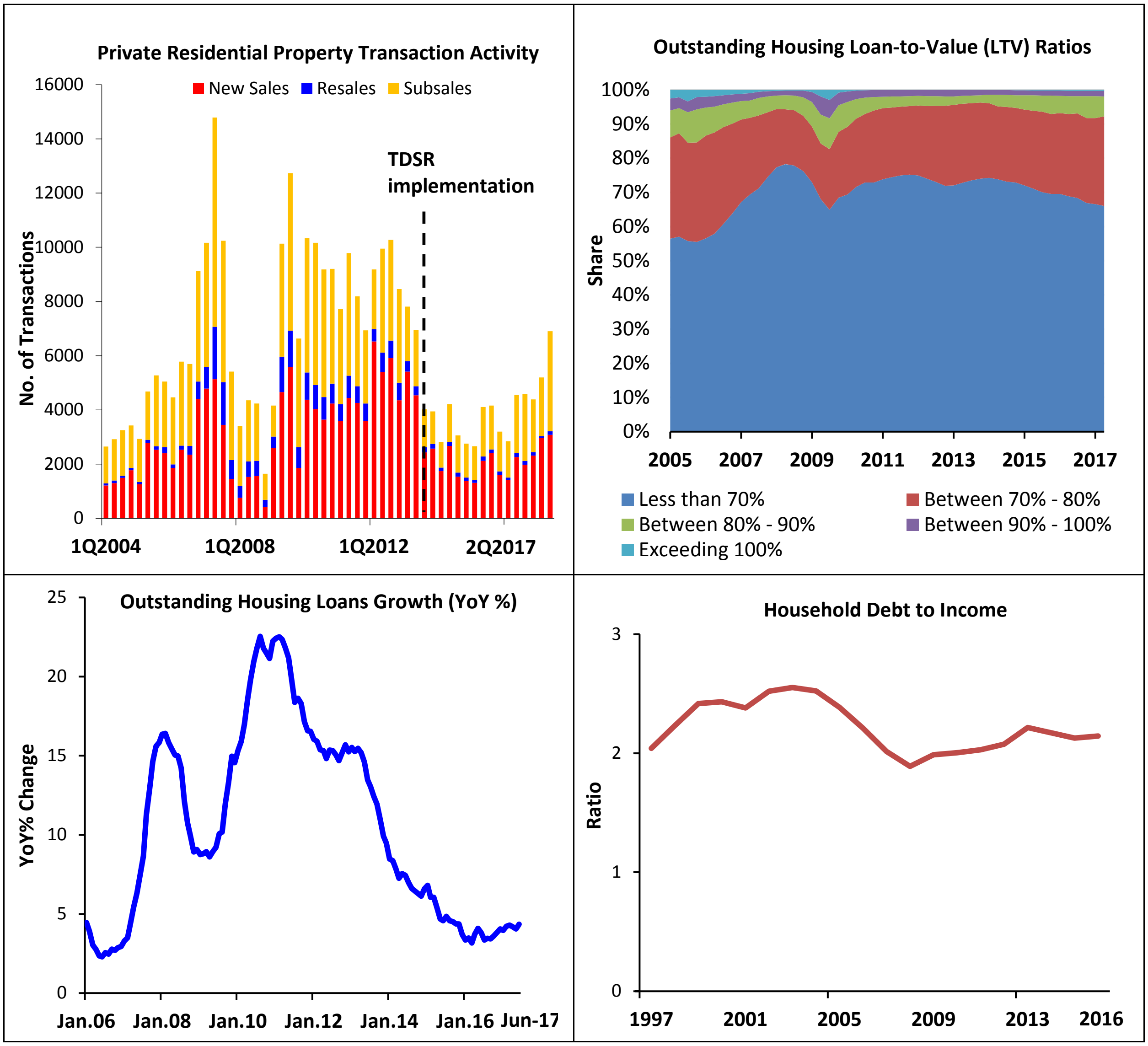
MAS considers the aforementioned measures to have generally been effective in improving the risk characteristics of new housing loans and moderating household leverage. Since the implementation of these measures, in particular the TDSR framework (see Graph 2-1 below):

- private residential property prices fell by 11.6% between Q3 2013 and Q1 2017;
- the average tenure of new housing loans fell from 30 years in Q3 2012 to 25 years in Q1 2017;
- the share of new housing loan borrowers in lower TDSR bands (i.e. less than or equal to 40%) increased from 37% in Q4 2013 to 44% in Q1 2017;
- the annual growth in household debt decreased from an average of 6.9% over the last five years to 3.2% in Q1 2017 ; and
- the number of borrowers with outstanding unsecured debt exceeding 24 times their monthly income has more than halved since February 2015 to less than 1% of unsecured credit account holders in Q1 2017.

Graph 2-1: Indicators of the property market in Singapore



76 See http://www.mas.gov.sg/~/media/resource/news_room/press_releases/2013/FAQS_on_MAS_Total_Debt_Servicing_Framework_for_Property_Loans_and_Refinements_to_Housing_Loan_Rules.pdf.



Source: MAS, URA.

Review of policy measures

The authorities regularly review conditions in the property market to ensure that the policy measures remain relevant as market conditions evolve. In March 2017, a joint press release by MAS and other government authorities announced that the TDSR framework would no longer apply to mortgage equity withdrawal loans with LTV ratios of 50% and below to give borrowers the flexibility to monetise their properties in their retirement years, and that the SSD would be lowered given the significant decline in speculative demand since 2013.[77]

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[77] Sub-sale transactions have fallen significantly (by 80%) in recent years, from 2,481 in 2012 to only 505 in 2016. Sub-sales, or sales of properties before completion from the original or subsequent buyers (i.e. not from the developer) to other buyers, are an indicator of the level of "flipping" or property speculation.

Annex 3: Follow-up of other key FSAP recommendations

This Annex presents the follow-up actions reported by the Singaporean authorities to key FSAP recommendations that are not covered in sections 2 and 3. The actions mentioned below have not been evaluated as part of the peer review and are presented solely for purposes of transparency and completeness.

Recommendations	***Steps taken to date and actions planned (including timeframes since the FSAP)***
Short Term Implementation (within 12 months)	
Increased attention to onsite inspections of banks' credit risk.	MAS has instituted a multi-year credit onsite inspection schedule for major banks and updated the relevant guidance to supervisors. MAS also completed thematic inspections of credit underwriting standards and lending practices of selected banks and issued an information paper *Thematic Review of Credit Underwriting Standards and Practices of Corporate Lending Business* in February 2016 to provide guidance on MAS' supervisory expectations. The paper outlined the key findings of the inspections, including areas where financial institutions should pay attention to as well as the sound practices observed.
Monitor Liquidity Coverage Ratio (LCR) ratios for significant foreign currencies.	MAS has monitored LCRs for consolidated currency, Singapore dollar and significant foreign currencies (including the U.S. dollar) for locally incorporated banks headquartered in Singapore on a monthly basis since January 2015. Foreign banks subject to the LCR framework commenced reporting the LCRs, similarly for consolidated currency, Singapore dollar and significant foreign currencies (including the U.S. dollar) from January 2016.
Mitigate legal risks to CCPs from conflicts of law across jurisdictions.	MAS has engaged with the US and EU authorities to address cross-border legal risks to CCPs. The Singapore Exchange Derivatives Clearing Limited (SGX-DC) is now registered with the US Commodity Futures Trading Commission (CFTC) as a derivatives clearing organisation, enabling US clients to clear trades on SGX-DC. The Singapore CCP regime has been recognised by the European Commission as equivalent and SGX-DC has been recognized as a third country CCP by the European Securities and Markets Authority, which enables European clients to clear trades on SGX-DC.
The CCPs to explore with members the possibility of widening their collateral pool and examine the feasibility of receiving Singapore government securities as collateral to improve access	SGX already accepts Singapore government securities (SGS) as eligible collateral. A study in 2014 by SGX concluded that, although SGX accepts SGS as eligible collateral, cash collateral was preferred by clearing members of the Central Depository (Pte) Limited and SGX-DC, because cash is most easily valued and transferable.

to central bank liquidity in times of stress.	It will not be practicable for SGX to place a limit on cash collateral given that cash is considered the most liquid asset in our markets.
Medium-Term Implementation (1–3 years)	
Further develop SGX recovery plans, identifying additional scenarios.	SGX has enhanced its recovery and resolution plans (RRP), through developing additional stress scenarios and recovery tools, taking into account the requirements in the CPMI-IOSCO Recovery Report for FMIs. On an ongoing basis, SGX will regularly review and update its RRP as appropriate, taking into account future international developments and other relevant circumstances (e.g. new product classes).
Upgrade the collateral that covers credit exposures related to the link with the Chicago Mercantile Exchange (CME).	SGX has assessed that the collateral it accepts from CME covers the credit exposures related to the link and is within SGX's risk appetite.
Formalize bilateral cooperative crisis management agreements for FMIs.	This recommendation refers to the cooperative crisis management arrangements between MAS and the CFTC in respect of the CME-SGX Mutual Offset System (MOS) link[78]. The supervisory cooperation MOU with CFTC currently allows MAS to engage with CFTC in emergency situations. MAS will consider international standards on crisis management and include more details on crisis coordination, where appropriate, in consultation with CFTC.
Consider changes to the structure of the MAS Board to strengthen operational independence in financial supervision.	No action will be taken. In MAS' view, MAS has legal and institutional safeguards that protect against potential conflicts of interest and maintains full operational independence. MAS remains committed to ensuring full operational independence in the supervision of FIs, and will review the safeguards from time to time.
Ensure that MAS' mandate for prudential supervision is not compromised by its developmental mandate.	Section 4 of the MAS Act has been amended to provide that MAS' developmental objective is subordinate to its supervision objective.

78 The MOS agreement enables futures positions opened on one participating exchange to be transferred to the other, creating a single, 24-hour marketplace between both exchanges.