

Achieving the G20 goal of resilient market-based finance

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The 2007-09 financial crisis revealed fundamental weaknesses in the global financial system which authorities and market participants failed to identify and address until it was too late. One such weakness was the growth of complex financing structures and long intermediation chains outside the banking system, which had spread risk across the global financial system. When the crisis struck, the opaqueness of this shadow banking system, coupled with a growing realisation of the degree to which risks had been mispriced, led to a rapid deterioration in market confidence and a sharp tightening of financing conditions that affected businesses and households.

In the decade since the crisis, authorities have sought to transform shadow banking activities into resilient market-based finance. Considerable progress has been made, with more effective oversight and regulatory frameworks now helping to better monitor and mitigate the risks associated with non-bank finance. However, the landscape of shadow banking activities continues to evolve. Consequently, identifying and assessing new and emerging risks remains essential in future.

This article considers factors that contributed to the crisis, explores the significant reforms that have changed the financial system for the better, identifies emerging risks that authorities need to consider, and explores how macroprudential policies can address these risks.

NB: The views expressed in this article are those of the Secretary General of the Financial Stability Board and do not necessarily reflect those of the Financial Stability Board or its members.

11 The rise and fall of toxic shadow banking

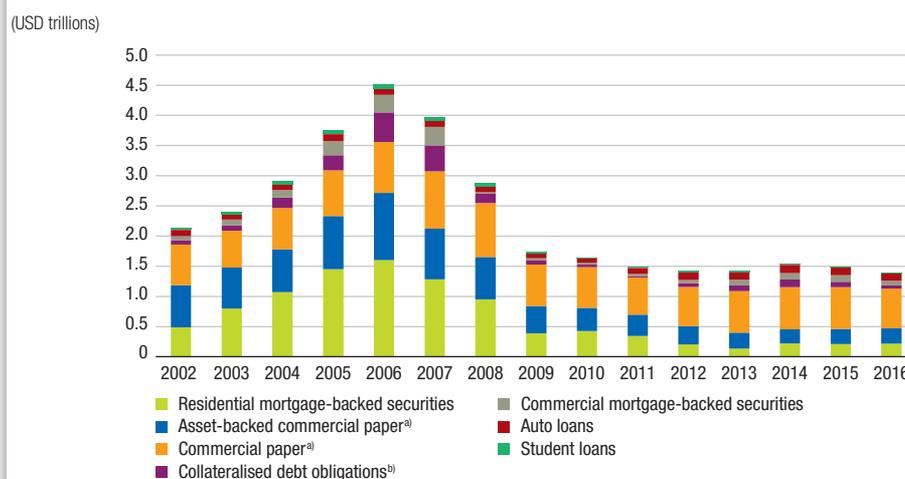
In the years leading up to the crisis, structural vulnerabilities had built up in global financial system. Complex financial products with long intermediation chains and misaligned incentive structures led to an accumulation of exposures that were poorly understood and managed across the system. Securitisation markets, which saw rapid growth and increased complexity before the crisis (see Chart 1), provide an example of this trend. As securitised products became more commonly used, risks were building underneath the surface for a number of reasons, including the extensive allocation of credit to low-credit-quality borrowers, the increase in leverage enabled by these products, and opacity brought about by the pooling, tranching and distribution of risks through the shadow banking system.

Complex securitisation vehicles exhibited many of these issues: poor retail mortgage underwriting standards; explicit or implicit credit support

offered by both banks and insurers; a reliance on inadequate ratings provided by credit rating agencies at the expense of effective due diligence; inappropriate accounting practices; and the sale of these toxic assets across the financial system.

Complexity and opacity became pervasive throughout the financial system. Banks' and insurers' holdings of securitised products, particularly mortgage related products, increased rapidly. The financial system as a whole became riskier. Many institutions did not fully understand their own risk exposures. Moreover, repo markets for fixed income securities, including riskier securitised products, enabled a significant build-up of leverage. Highly-rated structured products were considered risk-free and liquid, even if they were highly complex, which translated into what proved to be insufficient repo "haircuts" and excessive borrowing capacity. When US subprime loan performance worsened and housing prices declined in 2007, markets for subprime residential mortgage-backed securities (RMBS) and hard-to-value collateralised debt

C1 US and European structured finance



Source: Securities Industry and Financial Markets Association (SIFMA).
 Note: Structured finance includes securitisation issuance for US and Europe, where available.
 a) US commercial paper outstanding.
 b) Includes structured finance and collateralised loan obligations (CLOs).

obligations (CDOs) saw valuations decline significantly, which in turn increased haircuts on repos collateralised by these securities. The result was a sharp tightening of wholesale funding conditions, forcing institutions to reduce leverage through forced sales of assets.

Benign credit conditions kept these severe vulnerabilities under the surface for a while. When the bubble on underlying assets burst, the shockwave rippled through the global financial system with the links created by securitisation, repos and derivatives, causing a massive repricing of financial assets due to revaluation, sudden risk aversion, liquidity freezes and defaults in financial institutions which were excessively embedded in these shadow banking activities.

Neither market participants nor authorities had a sufficient understanding of the evolution of risk across the financial system. Many authorities lacked the mandate and the resources to identify emerging risks, or the policy tools to respond if they were able to identify them.

21 The financial system is now safer

21.1 The FSB's two-pronged approach to tackle shadow banking risks

In the wake of the crisis, the G20 mandated the Financial Stability Board (FSB) to develop and implement a series of reforms and policies to address the financial stability risks from shadow banking and transform it into resilient market-based finance.¹ Taken together with the reforms targeting banks, this was intended to promote efficient and stable funding of the real economy through a diversity of channels, including both banks and market-based finance. The reforms to transform shadow banking were designed to address misaligned incentives, increase transparency, reduce complexity and ensure more appropriate prudential treatment of activities that had been mispriced pre-crisis.

To pursue these goals, the FSB devised a two-pronged approach. First, it created a system-wide oversight framework for tracking developments in shadow banking. This framework allows authorities to detect and assess the sources of risks from shadow banking activities in a forward-looking manner. Since 2011, the framework has formed the basis for the FSB's annual global shadow banking monitoring exercise. This exercise facilitates better data collection, data-sharing among authorities – central bankers, market regulators, prudential supervisors and treasury officials – and allows for system-wide oversight so that entities or activities that could pose material risks to financial stability can be identified in a timely manner.

Second, the FSB has developed policy measures to ensure that shadow banking risks are subject to appropriate monitoring, oversight and regulation, while not inhibiting sustainable market-based financing. The approach is designed to be proportionate to the risks, focusing on those activities that are material to the financial system.

21.2 Policy measures to address shadow banking risks

The G20 reform process has led to the development of a number of policy tools to tackle issues in shadow banking, in three main areas.

- *Banks' involvement in shadow banking activities* – in order to encourage more prudent links with shadow banking, accounting standards and consolidation rules for off-balance sheet entities were reformed.² Bank prudential rules (i.e. Basel II.5-III) have also been enhanced to ensure banks' exposures to shadow banking are adequately captured. The Basel III framework has several features that have raised capital requirements for banks' exposure to shadow banking entities, including higher risk-weights for exposures to unregulated financial entities, risk-sensitive capital requirements for banks' investments in the equity of funds, and a standard for measuring and controlling large exposures.

¹ The FSB defines "shadow banking" broadly as "credit intermediation involving entities and activities (fully or partially) outside the regular banking system". For details, see FSB (2011).

² Such enhancements to consolidation rules for off-balance sheet entities include the Basel Committee on Banking Supervision's (BCBS') guidelines on step-in risk (see BCBS, 2017) that aim to mitigate the systemic risks stemming from potential financial distress in shadow banking entities spilling over to banks.

- *Liquidity and maturity mismatches and leverage in shadow banking* – measures include: steps to reduce the susceptibility of money market funds (MMFs) to runs; improvements to structural aspects of securities financing markets (e.g. tri-party repo market infrastructure reform); a framework for haircuts on non-centrally cleared securities financing transactions as well as margin requirements for over-the-counter derivatives that would limit the build-up of leverage through these transactions; and application of prudential regulation/supervision through changes in regulatory status (e.g. bank consolidation).
- *Addressing incentive problems and opaqueness associated with shadow banking* – measures to improve transparency and align incentives in securitisation, alongside more appropriate capitalisation of banks' securitisation-related exposures, include: improving disclosures and facilitating standardisation of securitisation;³ retention requirements; and enhancing the process of rating securitisation deals.

³ For example, the BCBS and International Organization of Securities Commissions (IOSCO) published criteria for identifying simple, transparent and comparable securitisation in July 2015, to assist the financial industry's development of simple and transparent securitisation structures. See BCBS – IOSCO (2015).

⁴ See Financial Stability Board – FSB (2017b), report to the G20 Hamburg Summit.

213 Toxic shadow banking risks have declined significantly

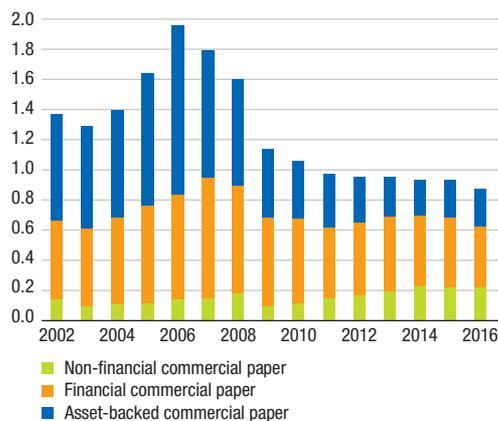
In July 2017, the FSB reported to G20 Leaders on the measures its members had taken to address shadow banking risks.⁴ The FSB's assessment highlighted that the most vulnerable or toxic parts of shadow banking activities which contributed to the crisis have declined significantly. These include asset-backed commercial paper (ABCP) programmes, structured investment vehicles (SIVs), RMBS, and CDOs (see Chart 1). In addition, the activities carried out now are more transparent, require higher levels of bank capital and are subject to greater scrutiny and with better risk alignment. Therefore, when these activities grow, they will do so on a more sustainable basis.

Other shadow banking activities, such as repos and those undertaken by MMFs, have experienced a normalisation from elevated pre-crisis levels (see Chart 2). Increased awareness of risks and a rejection of certain products, sounder funding

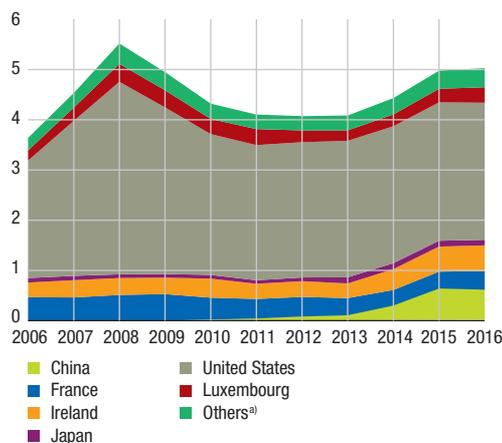
C2 Commercial paper and money market funds

(USD trillions)

a) US Commercial paper outstanding



b) Assets of money market funds



Sources: Securities Industry and Financial Markets Association (SIFMA) and Financial Stability Board (FSB) *Global Shadow Banking Monitoring Report 2017*.

Note: In Chart 2b, exchange rate effects have been netted out by using a constant exchange rate (from 2015).

a) Others: Argentina, Australia, Belgium, Brazil, Canada, Switzerland, Chile, Germany, Spain, Hong Kong, India, Indonesia, Italy, Republic of Korea, Cayman Islands, Mexico, Netherlands, Russian Federation, Saudi Arabia, Singapore, South Africa, Turkey, United Kingdom.

models and effective policy measures have contributed to this decline. Although some of these activities are expanding again, this growth is now on a more sustainable, more appropriately regulated footing.

Several trends suggest that financial reforms have strengthened the funding models of financial institutions. The introduction of liquidity and leverage ratios for banks have contributed to reduced reliance on repo funding in the United States, Europe and other large financial markets. As a consequence, liquidity mismatches on banks' balance sheets have declined, as have the number and size of maturity-matched transactions that add to leverage. Furthermore, repos of underlying securities with higher risk of losses, primarily securitised products, have declined significantly. This is particularly the case in the United States, where overnight repos have declined by over USD 1 trillion since the peak of the crisis. At the same time, the role of broker-dealers in providing leverage, warehousing of risk, structured products and related derivatives has declined.⁵

While strengthening funding models, there have been concerns that some policy measures may have had unintended effects on market liquidity. While there continues to be limited evidence of a broad reduction in market liquidity in normal times, continued monitoring and analysis of the evolution of market liquidity and its determinants is warranted.

Taken together, these reforms have largely addressed the roots of the shadow banking risks within the financial system that contributed to the financial crisis, from the build-up of excessive leverage and large liquidity mismatches to insufficient monitoring. The trend growth in the toxic elements of shadow banking have reduced and resilience has improved in market-based financing of the real economy. A decade after the crisis, the policies agreed on at the international level have made the financial system safer.

31 Evolving risks

311 Liquidity risks from asset management activities

The FSB's annual monitoring exercises show that non-bank credit intermediation keeps evolving. An agile, innovating financial sector that provides corporates and households with a broad range of products for financing real activity and management is a key pillar of sustained growth. At the same time, evolving intermediation structures also create the case for monitoring, and assessing on an ongoing basis to what extent this evolution can give rise to shadow banking risks. In its monitoring report, the FSB captures such activities in a narrow measure of shadow banking.

One area of non-bank credit intermediation that has grown significantly since the crisis is asset management through collective investment vehicles (CIVs). CIVs provide mechanisms for channelling funds to productive uses, while offering diversification benefits to a wide range of investors. To some extent, their growing role reflects greater diversity in financing real activity, especially in jurisdictions where market-based finance was underdeveloped. However, it is important that such growth does not create new risk for financial stability, for instance because risks are simply shifted from the banking sector to other parts of the financial system.

Some asset management activities can give rise to shadow banking risks.⁶ In particular, in some circumstances CIVs may have features that make them susceptible to runs. For example, CIVs that invest in relatively illiquid assets and are redeemable on demand or within a short timeframe (i.e. open-ended funds) can face large-scale and rapid withdrawals of funds in times of market stress from flights to quality or liquidity. Such redemption pressure (or runs) may arise if their investors no longer perceive the investments as safe. Leveraged CIVs that rely on borrowing or derivatives may also be exposed to run-like behaviour if lenders or counterparties are

⁵ Overall issuance of structured products has declined, and dealers' positions in credit default swaps (CDS) have declined gradually from USD 30 trillion gross notional in 2008, to USD 6 trillion in 2016. See Securities Industry and Financial Markets Association (SIFMA) CDS outstanding data.

⁶ See FSB (2018), for a definition of a narrow measure of shadow banking, which includes five economic functions (or activities) that may give rise to financial stability risks.

unwilling to roll over funding or take positions with CIVs under stressed conditions.

Overall, the assets of CIVs with features that make them susceptible to runs constitute about 75% of the FSB’s narrow measure of shadow banking (USD 32.3 trillion at end-2016, an 11% increase on the previous year). CIVs with such features include fixed income and mixed investment funds, MMFs and credit hedge funds. Some real estate funds, fund of funds, exchange-traded funds and pooled funds may be subject to the same risks. Liquidity transformation tends to be high for fixed income funds in some jurisdictions with short-term liabilities and short-term redeemable equity in excess of liquid assets. While policy measures have led to a conversion of a portion of MMFs into floating net asset value products, there is still some concern that they may be prone to run risk in the event of unexpected losses. Also, the pronounced growth of investment funds, particularly higher yielding credit funds, stands out as one of the

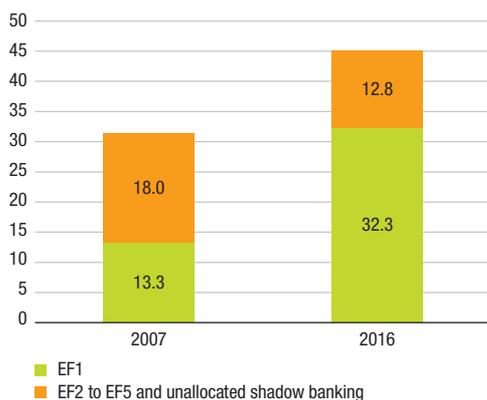
areas in which large-scale outflows from funds could affect other parts of the financial system.

Overall, shadow banking risks have evolved from short-term wholesale-funded credit extension involving the balance sheets of various leveraged entities prior to the crisis to open-ended CIVs that hold marketable debt instruments and engage in liquidity transformation. In an environment of search for yield, there has been a combination of higher credit risk, significant liquidity and maturity transformation. Thus, while shadow banking is less leveraged than before, reducing the overall financial stability risks posed, the sharp rise of liquidity transformation in CIVs could prove disruptive in periods of market stress. This is why the FSB recommended to address potential structural vulnerabilities from asset management activities in January 2017 and why the International Organization of Securities Commissions (IOSCO) is taking forward work in this area, as discussed in more detail later in this article.

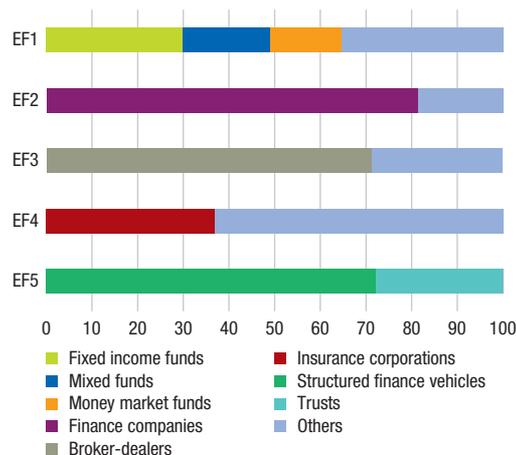
C3 The evolution of shadow banking activities by economic function

(evolution in USD trillions; breakdown in % of economic functions)

a) Evolution of shadow banking by economic function



b) Breakdown by main entity types (end-2016)



Source: Adapted from Financial Stability Board (FSB) *Global Shadow Banking Monitoring Report 2017*.

Notes: There are five economic functions (EF): EF1: management of collective investment vehicles with features that make them susceptible to runs, EF2: loan provision that is dependent on short-term funding, EF3: intermediation of market activities that is dependent on short-term funding or on secured funding of client assets, EF4: facilitation of credit creation and EF5: securitisation-based credit intermediation and funding of financial entities. Unallocated shadow banking: assets of entities that were assessed to be involved in shadow banking activities, but which could not be assigned to a specific economic function. For more details on economic functions see the FSB report.

Narrow measure for 29 jurisdictions, including China.

3|2 Shadow banking in a world of higher debt and lower credit quality

The risks from shadow banking, and financial intermediation in general, crucially depend on the quality of the underlying assets. During the 2007-09 financial crisis, it was the combination of vulnerable and opaque intermediation structures and poor quality of credit assets that contributed to a sharp rise in risk aversion and, eventually, a general loss of confidence in the soundness of the global financial system.

Against this backdrop, the steady increase in debt levels globally is a source of concern. Sovereign debt relative to GDP has plateaued at a high level across advanced economies (AEs), as has household debt in a number of economies. In emerging market economies (EMEs), credit to non-financial corporates is at or near historical levels, and continues to grow. While many issuers have extended the maturity of their outstanding debt, refinancing needs over the next few years are significant.

The rise in non-financial corporate debt has been mirrored by an increase in the leverage of publicly traded non-financial corporates in many jurisdictions since 2010. The growth of non-financial corporate leverage over the past several years appears to be widespread across AEs and EMEs (see Chart 4). Debt has risen relative to cash flows. As a consequence, the capacity to service this debt appears to have gradually declined to relatively low levels in particular for EME and US high yielding corporates. A significant and abrupt increase in interest rates could erode the debt servicing capacity of a number of firms, a risk that a deterioration in operating earnings would exacerbate.⁷

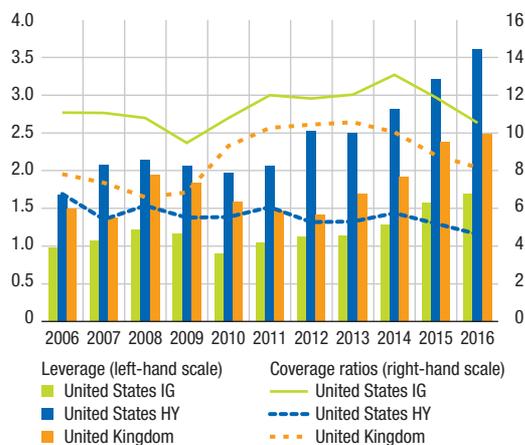
The financial stability implications of such a deterioration of credit risk would depend on a number of factors. The first line of defence is sufficient buffers to absorb losses, which prevent them from spreading through the financial system. Another is prudent assessment and management of risks, which helps to avoid a potentially abrupt tightening of financing conditions, including

⁷ Coverage ratios below 2 suggest high likelihood of repayment and solvency challenges. This hypothetical stress scenario is loosely aligned with the one discussed in section 4|2: "Macro stress simulations to assess liquidity risks".

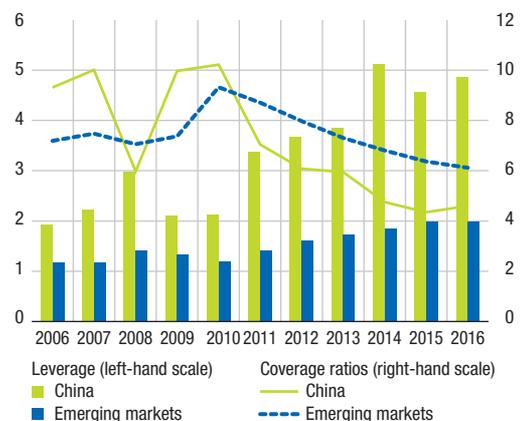
C4 Leverage and coverage ratios, since 2006 Medians of 100 largest corporates (excluding financials)

(left-hand scale: debt/EBITDA, right-hand scale: EBITDA/interest expenses)

a) US and UK corporate leverage and coverage ratios



b) EME corporate leverage and coverage ratios



Source: Standard & Poor's, S&P Capital IQ.

Note: EBITDA: earnings before interest, taxes, depreciation and amortisation, IG: investment grade, HY: high yield.

through sharp increases in margins or haircuts on collateral. The latter is particularly relevant for market-based finance, because the repricing of risk can have strong procyclical effects.

Do market participants properly price the risks they are taking? There have been signs of a growing disconnect between deteriorating underwriting standards in non-bank credit intermediation and aggressive pricing. For instance, the quality of covenants in the US corporate bond market has been declining steadily amidst tighter credit spreads.⁸ Issuance of commercial mortgage-backed securities (CMBS), collateralised loan obligations (CLOs), auto loan asset-backed securities (ABS) and student loan ABS issuance has risen significantly over the past several years, also accompanied by a deterioration in underwriting standards. As such, these structures might experience significant loss rates should the credit quality of their underlying high-yield assets deteriorate. In particular, covenant-lite leveraged loans – which offer investors less protection against loss – have risen well above pre-crisis elevated levels and now comprise the vast majority of leveraged loans issued to the market. As these loans are held primarily in CLOs and loan funds, higher losses could amplify risk to institutional and retail investors.

4I Addressing evolving risks

While the weaknesses that led to the crisis have been largely addressed, new shadow banking risks will continue to emerge as the financial system evolves. This calls for enhanced monitoring of shadow banking activities and the associated risks, and continued efforts to identify or develop macroprudential tools that could be used to contain financial stability risks.

4I1 Enhanced monitoring

FSB members have agreed to take additional steps to strengthen shadow banking monitoring to facilitate better assessment of risks, concentrations

and cross-border interconnectedness. Specifically, authorities are seeking to: improve data granularity on assets and liabilities as well as on cross-border interconnectedness; supplement flow of funds data with supervisory and/or commercially-available data to assess risks; and improve information-sharing on emerging risks. The FSB *Global Shadow Banking Monitoring Report 2017* also makes a number of improvements with the inclusion for the first time of Luxembourg, and of an assessment of the involvement of non-bank financial entities in China in shadow banking.

In addition, authorities are seeking to strengthen system-wide oversight. This includes (i) establishing a systematic process for assessing shadow banking risks, and ensuring that any entities or activities that could pose material financial stability risks are brought within the regulatory perimeter; (ii) addressing identified gaps in risk-related data; and (iii) removing impediments to cooperation and information-sharing between authorities.

4I2 Macroprudential toolkit

The growth of CIVs and the associated forms of liquidity transformation have shifted the focus on the development of tools to detect and address financial stability risks resulting from potential runs on such entities. These include measures to better assess and mitigate pressures that could contribute to runs, protracted erosion of market liquidity, and significant deviations in asset prices that could result in large valuation losses and fire sales.

Measures to address growing liquidity transformation

In January 2017, the FSB published policy recommendations to address structural vulnerabilities from asset management activities, many of which are currently being operationalised by IOSCO for authorities to implement in their respective jurisdictions.⁹

Several of the recommendations relate to liquidity mismatches associated with CIVs with short-term

⁸ See Moody's Investors Service (2017).

⁹ See FSB (2017a) and IOSCO (2018).

redemption features (or open-ended funds), and called for actions by authorities in order to reduce the chances of liquidity risks to the financial system. Specifically they seek to reduce the likelihood of material liquidity mismatches through, for example, ensuring redemption terms of a fund matches its investment profile, and widening the availability of risk management tools for open-ended funds. The importance of stress testing at the level of individual funds has also been emphasised so as to help them in improving their overall liquidity risk management and preparing for future market stress. A clear process for resorting to exceptional liquidity management tools has to be set up by the funds. While asset managers have the primary responsibility to exercise such exceptional tools regarding the open-ended funds they manage, authorities should provide guidance, or directions where appropriate, on their use in stressed conditions, taking into account possible consequences for financial stability.

The FSB also highlighted the importance of addressing leverage within CIVs or funds that could amplify market stress. Authorities currently do not have a common set of lenses to assess leverage in funds and their impact on the financial system. The FSB asked IOSCO to develop consistent measures of leverage in funds by end-2018 to facilitate more meaningful monitoring of leverage for financial stability purposes, and collect national/regional aggregated data on leverage based on the consistent measures it develops. IOSCO's work will help authorities in making such an assessment and help inform them in designing appropriate policy responses.

Macro stress simulations to assess system-wide liquidity risks

Empirical evidence suggests that fund investors can collectively behave procyclically, redeeming their investments when the prices of assets fall in stress conditions. Funds investing in less liquid assets have become more prevalent, and a feature of short-notice redemption may be encouraging investors into these areas. In relatively illiquid

markets – where forced sales have larger effects on prices – procyclical behaviour by fund investors could create a feedback loop of falling asset prices, redemptions, asset sales, and further price declines. Macro stress assessments, including system-wide stress tests, are an emerging approach to evaluate how the interaction of financial intermediaries can affect market liquidity under adverse conditions. Such assessments call for an approach that is distinct from the stress testing of banks. The investment fund industry is diverse, with a broad variety of business models, investment strategies, and risk profiles. The challenge is to develop models that capture these features, and can provide reliable insights into its aggregate behaviour, including the probability of negative feedback loops developing.

Currently, a number of authorities with financial stability mandates, as well as the International Monetary Fund, are conducting or developing simulations that capture the behaviour of investment funds and other investors. The FSB, in a recent pilot systemic stress simulation exercise, employed a modelling approach which assessed the consequences of market stresses and examined the resilience of liquidity across a range of corporate bond markets. The framework used for this exercise, adapted from a Bank of England model, offers one way to frame assessments of how, and the extent to which, market-based finance that involves taking bank-like risks might amplify shocks.¹⁰

Although such exercises are still in an exploratory stage, over time they may provide useful insights that could help inform both funds' liquidity risk management practices and possible actions of authorities.

51 Conclusion

The financial system is safer, simpler and fairer than before the crisis. This includes the process of transforming shadow banking into resilient market-based finance, which has an important role to play in supporting economic growth. Resilient market-based finance can complement

¹⁰ See Baranova, Coen, Lowe, Noss and Silvestri (2017).

bank finance in many respects, not least by acting as a spare tyre in the case of stress in other parts of the financial system. Indeed, activities such as infrastructure finance provide an example of the way in which these different parts of the financial system can work together to finance crucial economic activities.

A constantly evolving and innovating financial system is a hallmark of a functioning market economy. However, as the financial system evolves,

so do systemic risks. Policymakers need to constantly assess risks across the financial system and consider whether supervisors have sufficient tools to address emerging risks. Well-designed monitoring and effective regulation and supervision support the identification of risks, their proper pricing and management in a way that preserves the benefits of diverse forms of financial intermediation. A clear macroprudential approach will be key to ensuring that market-based finance continues to meet the needs of society.

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