Understanding and addressing systemic risks in non-bank financial intermediation

Public research conference 8-9 June 2022

Background note

Objective

The financial market turmoil in March 2020, brought about by the COVID-19 shock, underscored the need to strengthen resilience in the non-bank financial intermediation (NBFI) sector.

The Financial Stability Board (FSB) is coordinating the international regulatory community's assessment of vulnerabilities and the appropriate financial policy response, working closely with relevant standard setting bodies (SSBs).[1] The FSB's NBFI work programme involves:[2]

- assessing vulnerabilities in specific NBFI areas that may have contributed to the build-up of liquidity imbalances and the amplification of stress;
- enhancing the understanding and ongoing monitoring of systemic risks in NBFI; and
- developing policies to address such risks where appropriate, including by assessing the adequacy of current policy tools and approaches given the desired level of resilience for the sector.

This conference contributes to the FSB's work to develop a systemic approach to NBFI. It features presentations of analytical work and research that advances the understanding of systemic risks in NBFI and specific policies and approaches that may be used to address them.

Background

NBFI has grown considerably – to almost half of global financial assets, compared to 42% in 2008 – and become more diverse over this period.[3] The growth of NBFI implies that risks are increasingly being intermediated and held outside the banking sector, with implications for global financial system resilience. A shift from the traditional model where banks keep credit

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1 These include the Basel Committee on Banking Supervision (BCBS), the Committee on Payments and Market Infrastructures (CPMI) and the International Organization of Securities Commissions (IOSCO).

2 See the FSB's *Enhancing the Resilience of Non-Bank Financial Intermediation: Progress report* (November 2021).

3 See the FSB's *Global Monitoring Report on Non-Bank Financial Intermediation 2021* (December 2021).

risk on their balance sheets to a model where it is borne by end-investors, and traded in financial markets, means that financial system resilience depends less directly on bank buffers and more on the ability of investors to effectively manage market, credit and liquidity risk in times of stress. This in turn implies greater reliance on market liquidity and price signals for managing portfolios and the associated risks.

At the same time, increased reliance on NBFI has resulted in shifts to both the demand and supply of liquidity, as well as changes to their sensitivity in a given shock. On the one hand, the demand for liquidity has increased as the size of debt markets and the importance of investors (such as funds) offering liquidity on demand has grown. This growth may have been sustained by the low interest rate environment and other factors (e.g. tax treatment) that have encouraged debt accumulation and a search for yield by investors. On the other hand, the supply of market liquidity by banks – which continue to play a critical role in core funding markets – has not kept pace with this increase. In addition, greater interconnectedness among market participants has accentuated market stress through different parts of the system.

Understanding how the shift towards NBFI affects the amplification and transmission of shocks involves analysis of the interaction and propagation of risks from a system-wide perspective. Conceptually, such a system-wide perspective would combine the following layers: (i) an assessment of potential vulnerabilities and the resulting liquidity demands under stress across different non-bank financial institutions and markets; (ii) the identification and quantification, to the extent possible, of key interconnections that could propagate market stress across the global financial system; and (iii) an assessment of the potential interaction of vulnerabilities and interconnections, and their implications for the liquidity of core markets that underpin the functioning of the global financial system.

Policies to address systemic risk in NBFI will have to take into account the heterogeneity of the sector. The focus of policy work is to ensure that the toolkit is adequate and effective from a system-wide perspective, drawing on the lessons from the March 2020 market turmoil. Types of policies that could be considered include measures to: mitigate unexpected and significant shifts in liquidity demand; enhance the resilience of liquidity supply in stress; and enhance risk monitoring and preparedness of authorities and market participants. Finally, there is the question of the effects and potential role of public sector interventions.

Structure of the conference and content of the sessions

The conference is structured in four sessions, with three papers presented in each session (see the annotated agenda for more details). One author for each paper will be invited to briefly present the main analysis and conclusions, followed by a discussant. **After the presentations by the authors and discussants in each session, the floor will be open for an exchange of views on the practical implications of this research and how it advances the understanding of systemic risks in NBFI and potential policy responses.**

Session 1 deals with liquidity imbalances in bond markets and implications for systemic risk; Session 2 discusses interconnectedness in NBFI; Session 3 covers data and tools to enhance risk assessment and monitoring of the NBFI sector; and Session 4 discusses policy tools and approaches to address systemic risk in NBFI. Background information on each of these sessions is presented below.

Session 1: Liquidity imbalances in bond markets and implications for systemic risk

This session will discuss factors (both structural and conjunctural) responsible for sharp spikes in bond liquidity demand or reductions in liquidity supply in stress periods.

The availability of liquidity and its effective intermediation under stressed market conditions is a key determinant of the functioning and resilience of the NBFI ecosystem. Efficient and resilient market-based intermediation depends on the ability of market participants to manage risks efficiently and minimise market dislocations when adjusting their portfolios. These dislocations become more likely in the case of large imbalances between liquidity supply and demand in the event of a shock.

Changes to the financial system over the past decade may have resulted in shifts to both the demand and supply of liquidity, as well as changes to their sensitivity in a given shock. On the one hand, the demand for liquidity has increased as the size of debt markets and the importance of investors (such as funds) offering liquidity on demand has grown. On the other hand, the supply of market liquidity by banks – which continue to play a critical role in core funding markets – has not kept pace with this increase. The combination of these factors implies potentially larger swings in liquidity needs for a shock of a given size. In addition, the greater interconnectedness among market participants described above has accentuated market stress through different parts of the system.

Liquidity imbalances, especially in dealer-intermediated bond markets, can stem from unexpected and significant spikes in liquidity demand combined with insufficient liquidity supply at the system-wide level. Liquidity demand may increase as market participants seek to increase cash holdings while at the same time liquidity supply may decline due to deleveraging and reduction of market making services. This interaction can result in fire sales and the transmission of stress to other parts of the financial system and the economy. Fire sales could be the result of various dynamics including first-mover advantages arising from liquidity mismatches; the behaviour of leveraged investors in stress; and sudden and large margin calls from derivatives and securities positions.

Against this backdrop, the FSB is interested in understanding better the implications of the growth of bond markets and of changes to the investor base and role of dealers for systemic risk; the main drivers of liquidity imbalances in government and corporate bond[4] markets during periods of stress; how different parts of the NBFI ecosystem contribute to liquidity imbalances in aggregate; and under what conditions could such imbalances result in system-wide stress.

Selected papers for this session touch upon a number of relevant issues and present evidence that bond markets are subject to large liquidity imbalances in periods of stress:

- *Aramonte et al*. discusses structural shifts in intermediation and the importance of leverage fluctuations caused by changes in margin requirements to understand

[4] See IOSCO, *Corporate Bond Markets – Drivers of Liquidity During COVID-19 Induced Market Stresses* (April 2022) for an analysis of liquidity in corporate bond markets.

changes in the supply and demand of liquidity. It also lays out a framework for the key channels of propagation of systemic risk, emphasising the role of leverage fluctuations through margin calls.

- *Czech et al*. analyses spill-over effects of the US dollar on other markets, resulting from its role as the global currency of choice. It shows that as non-US institutions hedge their dollar exposures using derivatives – and the US dollar tends to appreciate against other currencies in stress periods – these institutions sell their domestic safe assets to meet margin calls on their short positions exacerbating the stress in domestic markets.

- *Jurkatis et al*. examines the importance of bilateral relationships in dealer-intermediated markets to access liquidity in stress. It shows that clients with a stronger relationship with a dealer receive better prices compared to other clients, especially in period of stress and for trades that cannot be matched against other order flow. This highlights the need for institutions to properly manage their liquidity and access to intermediation services.

Session 2: Interconnectedness in NBFI

This session will discuss concepts and methods of measuring interconnectedness within the NBFI ecosystem as well as linkages between the NBFI sector, banks, and the real economy.

The NBFI ecosystem comprises a diverse set of financial activities, entities and infrastructures interconnected among themselves, to the banking sector and to the broader economy. NBFI interconnectedness has grown over the past decade, including on a cross-border basis.[5] Linkages with banks take different forms – funding connections (including through repo markets and backup lines of credit), investments in bank-issued instruments by non-bank entities, ownership links, and reliance on bank dealers for market intermediation. Moreover, cross-border links with banks and non-bank institutions have increased, not least owing to the use of the US dollar as a funding and investment currency. Financial centres and large advanced economies play a prominent role, as hosts of the largest and most interconnected non-bank financial institutions. An increasing number of these entities, in particular asset managers, are offering products, raising funds and channelling investments outside their home market. A consequence of these trends is that non-bank financial institutions have become more interconnected and also dependent on US dollar funding, while having less recourse than banks to funding sources such as central bank facilities. These linkages mean that stress can propagate across the financial system, highlighting the increased importance of assessing interconnectedness.

Recent work carried out by the FSB's Workstream on Interconnectedness Mapping (WIM) has involved the development of a taxonomy of financial sector linkages, categorising these connections based on the types of cash flows to which they are related. These included discretionary cash flows whose inception was voluntary (e.g. purchases of investment fund shares) and contingent cash flows that reflect obligations to counterparties or investors (e.g.

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5 See FSB, *Global monitoring report on non-bank financial intermediation* (December 2021)

margin payments). This taxonomy has enabled the FSB to develop maps illustrating financial interconnectedness that depict changes in cash flows in normal periods and periods of stress across different markets. Some of these maps have been published in various FSB and SSB reports analysing NBFI issues in the past two years.

In 2020, the WIM developed high-level 'analytical maps' to support the FSB's Holistic Review of the March 2020 market turmoil.[6] These served as a starting point for 'zoomed-in' maps that illustrate further details of financial interconnections pertaining to certain sectors (money market funds, open-ended funds) and types of cash flows (margin calls, USD funding to emerging market economies).[7] The 'zoomed-in' maps built up on the choice of sectors and categorisation of interlinkages used in the high-level 'analytical' maps and sought to capture greater detail and heterogeneity in certain areas of the financial system. In doing so they were able to shed further light on the channels through which the March 2020 market stress propagated across the financial system.

Very limited data was available with which to quantify financial interconnections within these maps, in particular on the scale of cash flows between different sectors. Slightly more data was available on the stocks of exposures between sectors, which for instance allowed for a partial quantification of the interconnections in the 'zoomed-in' maps on money market funds.

Against this backdrop, the FSB is interested in the types of NBFI linkages that are most relevant from a financial stability perspective; including the main mechanisms through which liquidity imbalances are transmitted through the financial system; under what circumstances can these mechanisms act as an absorber (as opposed to an amplifier) of shocks; and how interconnectedness in NBFI can be measured and monitored.

The papers selected for this session focus mainly on money markets, given their importance in the financial system:

- *Fache Rousová et al.* highlights the crucial role played by variation margin payments faced by investors holding money market funds (MMFs) in determining outflows. The paper highlights that some investors tend to treat MMFs as cash and, in March 2020, sold their MMF units when faced with margin calls on their derivative exposures.

- *Fricke et al.* documents significant cross-border effects of the 2014 US MMF reforms on euro area MMFs. The paper shows that funds based in Europe received large inflows from foreign investors following the US reforms, highlighting regulatory spillovers and the connectedness of international financial markets.

- *d'Avernas and Vandeweyer* argue that recent disruptions in US dollar money markets can be explained by the unintended consequences of new intraday liquidity regulations. Requiring banks to pre-fund expected flows generates intermittent shortages of intraday liquidity and restricts banks' supply of overnight liquidity, leading

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6 See FSB, *Holistic review of the March market turmoil* (November 2020).

7 See, for instance, FSB, *Policy proposals to enhance money market fund resilience: Final report* (October 2021); BCBS-CPMI-IOSCO, *Review of margining practices: Consultative report* (October 2021); and FSB, *US Dollar Funding and Emerging Market Economy Vulnerabilities* (April 2022).

to sharp spikes in short-term rates. This highlights the linkages of the NBFI and banking sectors.

Session 3: Data and tools to enhance risk assessment and monitoring the NBFI sector

This session will discuss data sources and analytical tools that authorities and market participants can use to monitor developments and assess potential amplifications and feedback loops in the event of exogenous and endogenous shocks.

A key theme emerging from the work carried out so far by the FSB is the existence of significant data gaps for NBFI risk monitoring by authorities. A number of market participants in FSB outreach events also stressed the importance of greater transparency for market functioning, especially in dealer-intermediated markets. An expanded coverage and better quality of data on the activities and positions of market participants as well as on market functioning could help the monitoring of trends and assessment of vulnerabilities in specific NBFI segments. The FSB work to date has highlighted that more data may be needed in some cases, such as on the preparedness of market participants for liquidity demands; MMF investor base; and issuance and trading activities fixed income markets. More effective use and greater sharing of information already collected (e.g. derivatives transactions in trade repositories) can also enhance monitoring of the build-up of risks.

Monitoring systemic risk in NBFI also involves the enhancement of existing, and development of new, analytical tools. Such tools could include refined indicators of vulnerabilities in individual NBFI sectors and associated with particular activities; segment-specific and system-wide interconnectedness maps (see above section); and stress tests, where appropriate, to assess the ability of market participants to respond to a shock and analyse common vulnerabilities and major spillovers across markets.

Against this backdrop, the FSB is interested in indicators to monitor risks in the NBFI sector; how existing data sources can be used more effectively for this purpose; whether further reporting or disclosure requirements should be considered; and the extent to which tools such as stress testing should be used to assess NBFI risks from a forward-looking perspective.

Selected papers for this session focus on measures that can be used to monitor risks in the NBFI sector and assess the functioning of financial markets:

- *Cincinelli et al*. analyses the relationship between non-bank intermediaries, leverage and systemic risk using a number of indicators. The paper finds that leverage is pro-cyclical for traditional banks, while it only becomes pro-cyclical for non-banks in periods of stress; and that, in general, non-banks contribute significantly to systemic risk.

- *Fukker et al.* introduces a novel method to assess the market price impact of sales in the presence of overlapping portfolios, to monitor a source of systemic risk. By looking at trading activity on a security-by-security basis, the paper shows that system-level losses due to overlapping portfolios in stress periods can be substantial.

- *Wu* highlights the role of the liquidity premium in measuring the ease of trading corporate bonds and the underlying liquidity of the market. The paper documents a considerable increase in the liquidity premium for corporate bonds since the 2008 crisis and establishes a link between changes in liquidity premia and post-crisis regulation.

Session 4: Policy tools and approaches to address systemic risk in NBFI

This session will discuss policies that authorities should consider to enhance the resilience of the NBFI sector, drawing on the experience and lessons of the March 2020 market turmoil.

The FSB is assessing whether the current policy toolkit is adequate and effective from a system-wide perspective. This entails mapping existing policy tools into the different parts of the NBFI ecosystem and understanding their key features; examining the extent to which these tools have been/could be used to contain the build-up of liquidity imbalances; and exploring whether there is a case of redeploying any existing tools (e.g. in terms of their design or use), or adding new tools, to close gaps or address remaining vulnerabilities that could give rise to liquidity imbalances at the system-wide level.

There is already a well-established and diverse set of policy tools for NBFI. The FSB, working with SSBs, developed a framework and policy toolkit for strengthening the oversight and regulation of non-bank entities after the 2008 financial crisis.[8] The toolkit is designed to look at the underlying economic function rather than specific legal form and structure, and offers a range of options to address different risk types that may be present across entities and activities in the NBFI sector. Many of these tools have been developed to serve other purposes (e.g. investor protection), but they can also be useful to address systemic risk.

Policies to address systemic risk in NBFI will have to take into account the heterogeneity of the sector and the diversity of business models, balance sheets and financial exposures that may give rise to vulnerabilities. Policy measures to strengthen the resilience of individual parts of the NBFI ecosystem are therefore a key part of addressing systemic risk in NBFI. The November 2021 FSB progress report notes that such policies could include measures to reduce liquidity demand spikes, to enhance the resilience of liquidity supply in stress, and to enhance risk monitoring and the preparedness of authorities and market participants. International cooperation and coordination is necessary given the cross-border nature of NBFI.

Policies to address systemic risk associated with NBFI need to consider the impact on financial system resilience as a whole. Measures to enhance resilience of individual segments may not effectively address systemic risks if they result in the transfer of risk to other sectors, including to entities or activities currently outside of the regulatory perimeter. Efforts to strengthen NBFI resilience should not therefore compromise the resilience in other parts of the financial system.

Complementary to these policies is work on operational considerations for effective official sector interventions to address market dysfunction. The objective of this work is not to promote interventions as a policy tool to enhance NBFI resilience, but to help ensure official sector liquidity provision in events that threaten systemic stability without exacerbating moral hazard.

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8 See the FSB *Policy Framework for Strengthening Oversight and Regulation of Shadow Banking Entities* (August 2013).

A key overarching principle for public interventions is that they should act as backstops and not substitute for the primary obligation of market participants to manage their own risks.

Against this backdrop, the FSB is interested in policy tools and approaches that are most relevant for addressing systemic risk in NBFI; how authorities can ensure that the framework used to regulate non-banks from a financial stability perspective is comprehensive and coherent; whether the focus should mainly be on redeploying existing NBFI policy tools or on adding new tools to close any gaps; and the extent to which certain NBFI policy tools should be designed, implemented or activated by authorities, rather than be left to market participants.

Papers in this session touch upon a number of relevant areas:

- *Emter et al*. discusses the liquidity management tools that can be used by open-ended funds facing large redemptions from investors. The paper focuses on corporate bond funds and finds that liquidity management tools can be effective in reducing outflows, thereby mitigating vulnerabilities stemming from liquidity mismatches.

- *Dieler et al.* focuses on repo markets and highlights a trade-off between the efficient allocation of short-term funding with resilience to funding shocks. The paper analyses how different trading and clearing arrangements can impact the resilience of the repo market, providing input to authorities considering central clearing reforms in this area.

- *Acharya et al*. highlights some potential unintended consequences associated with central bank interventions, highlighting the need for financial markets to self-insure against shocks. The paper documents capital misallocation in the US investment-grade corporate bond market, driven by quantitative easing (QE). It finds that risky firms just above the investment grade rating cut-off enjoyed subsidized bond financing since 2009, especially when the scale of QE purchases peaked. Firms used this privilege to fund risky acquisitions and increase market share but suffered more severe downgrades at the onset of the pandemic.