FINANCIAL STABILITY REVIEW

IS MACROPRUDENTIAL POLICY RESILIENT TO THE PANDEMIC?

MARCH 2021 - NO. 24

PREFACE

This 24th edition of the Banque de France's Financial Stability Review is a special issue devoted to macroprudential policy in the midst of the Covid crisis. For a decade, we have been defining and implementing the macroprudential framework. While macroprudential policy is designed to address financial crises, it is also relevant in this economic crisis caused by the health crisis.

While this is not a crisis of the financial system, and banks have on the contrary provided some of the responses to combat the economic crisis, it has nevertheless occurred in the context of financial vulnerabilities resulting from a vibrant financial cycle expansion and persistently low interest rates: high valuations of some assets, high levels of public and private debt, and the growing strength of the non-bank financial sector.

The different points of view expressed in this edition provide insights into the issues that will be on our macroprudential agenda in the coming decade. In particular, it is essential (i) to better address the international dimension of systemic financial risk, and more specifically to strengthen the European macroprudential framework; (ii) to extend the application of macroprudential rules to the financial sector as a whole, beyond banks; (iii) to establish better coordination between monetary and macroprudential policies on financial stability issues.

Regarding all these subjects, we are pleased and honoured to benefit from the insights of the contributors to this review:

Luis de Guindos, Vice-President of the European Central Bank, reminds us of the extent to which our tools for stress testing, in particular macroprudential tools, are essential both in preventing crises and in steering our decisions in times of greatest uncertainty.

Gabriel Makhlouf, Governor of the Central Bank of Ireland, calls for better macroprudential regulation of market finance and in particular of investment funds in view of the turmoil observed during the peak of the covid crisis on the markets;

Richard Portes, member of the Advisory Scientific Committee to the European Systemic Risk Board, shows us how essential coordination and initiatives at European level are for crisis management and prevention.

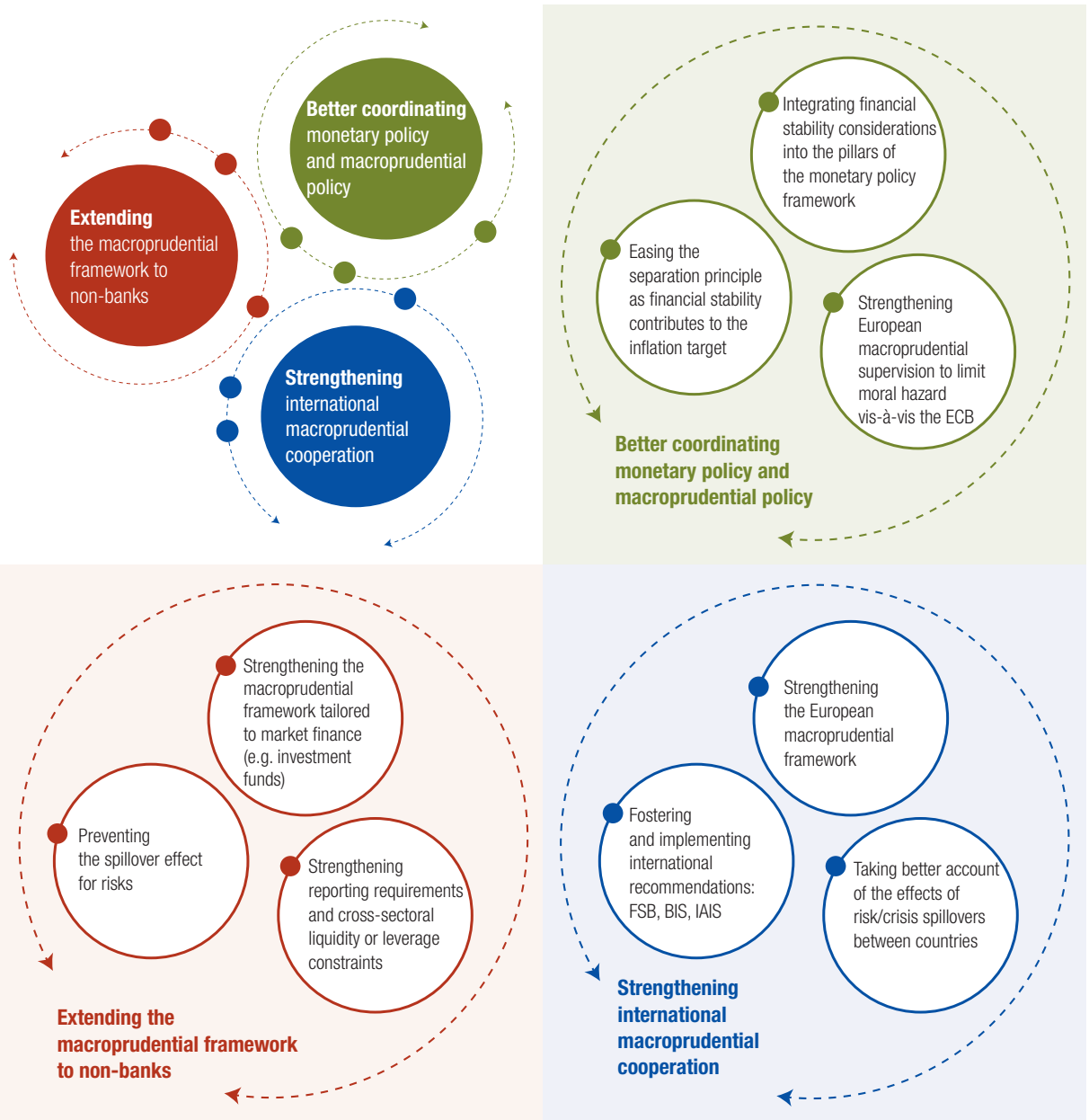
Jonathan Dixon, Secretary-General of the International Association of Insurance Supervisors, highlights the progress made in the insurance sector in addressing systemic risks, particularly during the Covid crisis.

Hyun Song Shin, Economic Adviser and Head of Research of the Bank for International Settlements, and his co-authors (**Stefan Avdjiev** and **Bat-el Berger**), broaden this analysis to emerging countries: they have held up reasonably well and the capital flight that had potentially devastating effects in previous crises has not occurred;

Claudia Buch, Vice-President of the Bundesbank, **Linda Goldberg**, Senior Vice President at the Federal Reserve Bank of New York, and **Matthieu Bussière**, Director of Monetary and Financial Research at the Banque de France warn us, however, about the risk of a desynchronised global recovery and the role that systemic banks can play in this respect.

Finally, for my part, I will address the issue of improving the coordination between macroprudential policy and monetary policy, which is necessary and should also be one of the lessons to be learned from the crisis episode we are experiencing.

François Villeroy de Galhau
Governor, Banque de France


Better coordinating monetary policy and macroprudential policy
Extending the macroprudential framework to non-banks
Strengthening international macroprudential cooperation
Integrating financial stability considerations into the pillars of the monetary policy framework
Easing the separation principle as financial stability contributes to the inflation target
Strengthening European macroprudential supervision to limit moral hazard vis-à-vis the ECB
Better coordinating monetary policy and macroprudential policy
Strengthening the macroprudential framework tailored to market finance (e.g. investment funds)
Preventing the spillover effect for risks
Strengthening reporting requirements and cross-sectoral liquidity or leverage constraints
Extending the macroprudential framework to non-banks
Strengthening the European macroprudential framework
Fostering and implementing international recommendations: FSB, BIS, IAIS
Taking better account of the effects of risk/crisis spillovers between countries
Strengthening international macroprudential cooperation

CONTENTS

FINANCIAL STABILITY AT THE NEXUS OF MONETARY AND MACROPRUDENTIAL POLICIES

François VILLEROY de GALHAU

Governor
Banque de France

The Eurosystem delivered a swift and massive response to the Covid-19 crisis as it sought to maintain favourable financing conditions for the whole economy. This response was aided by the resilience of the financial system, which was strengthened by reforms introduced in the aftermath of the 2008 financial crisis. It was similarly able to draw on an expanded range of flexible and innovative monetary policy instruments.

But a prolonged accommodative monetary policy can lead to adverse effects for financial stability through reduced market discipline, excessive risk-taking encouraged by the moral hazard created during the resolution of past crises, and increased leverage among economic agents. To more effectively prevent the risks of financial instability and safeguard monetary policy transmission channels, we need to go beyond the principle of strictly separating monetary and macroprudential policies and instead adopt a principle of coordination.

However, the macroprudential framework remains an essential line of defence and must also be strengthened in two critical areas: the European framework needs to be bolstered; and non-bank financial institutions need to be included in the framework.

These reforms represent the new frontier that we must cross as we build on progress towards a safer financial system, within Europe and around the world.

The Covid-19 crisis is testing the soundness of the financial system and, by extension, the appropriateness of all the reforms, including macroprudential reforms, adopted following the 2008 financial crisis.

Unlike in 2008, the banking sector has shown itself to be resilient because it is better capitalised, thanks to joint efforts by micro- and macroprudential authorities. Beyond measures to strengthen the capital of French (but also European) banks, which doubled between 2008 and 2020 to reach around 15% of banks' total (weighted) assets, several macroprudential firewalls were also set up before the crisis broke. In France, the Haut Conseil de stabilité financière (HCSF – High Council for Financial Stability) activated countercyclical buffers, placed limits on the exposure of systemically important banks to the most heavily indebted companies and issued recommendations on exercising caution in housing lending.

These measures have been beneficial in managing this latest crisis, with the soundness of the banking system supporting the effectiveness of measures taken by public authorities, governments and central banks to cope with the pandemic and its economic fall-out. The Eurosystem, in particular, quickly mobilised a broad array of instruments to support financing for the real economy, notably through banks (*see Chart 1*). These measures supplemented fiscal measures adopted domestically to support companies and households hit hard by the crisis.

Yet implementing a persistently accommodative monetary policy could have collateral impacts on financial stability, to the point that the build-up of risks for the financial system might interfere with the effective transmission of monetary policy. Because of this threat, when pursuing a given inflation target, monetary policy not only prioritises instruments whose design and implementation make the smallest possible contribution to financial imbalances, but also factors financial stability-related trends into its action.

Elsewhere, while banks are showing resilience, the growing footprint of investment funds in financing the real economy makes it necessary to ensure that these participants are able to avoid procyclical behaviour that might amplify liquidity stress. In this regard, the macroprudential framework, which applies only to banking entities and essentially on a domestic basis, falls short. A macroprudential framework also needs to be developed for non-bank financial intermediaries, with coordination at international level.

In short, macroprudential policy will not be enough if it is isolated from monetary policy (Section 1). Yet it can and must be more effective at European level (Section 2) as well as regarding non-banks (Section 3).

1 Learn all the lessons from interactions between monetary policy and financial stability

The traditional principle: keep monetary policy separate from macroprudential policy

The global financial crisis in 2008 showed that price stability was not a sufficient guarantee of financial stability and highlighted the need for macroprudential policy. After 2008 came a realisation that crises linked to financial activities, and specifically bank activities, can have systemic consequences that may be extremely adverse for the stability of the wider financial system and sufficiently serious to affect the real economy as well. The way the 2008 crisis unfolded, through its impacts on economic activity and hence on consumer prices, underlined the need to ensure the soundness of the financial system, and specifically of the banking system, to safeguard against a repeat of similar turmoil.

The Basel Committee on Banking Supervision (BCBS) took an important step forward in this regard in September 2010 with the Basel III reform of the international regulatory framework, which was approved by G20 leaders at the Seoul summit in November 2010. In addition to strengthening microprudential capital, liquidity and leverage requirements, the BCBS established a two-part macroprudential framework for bank supervision. First, this framework seeks to reduce the magnitude of financial cycles and thereby contain the tendency of the banking system to exacerbate business cycle peaks and troughs through excessive or, conversely, insufficient credit distribution. The flagship tool introduced was the countercyclical capital buffer, which requires banks to increase their regulatory capital during periods of excessive credit growth. Second, the macroprudential framework aims to mitigate the transmission of shocks through the financial system, notably by means of the capital surcharge required for the most systemically important banks.

This macroprudential response was implemented in accordance with the Tinbergen rule, with macroprudential policy responsible for financial stability and monetary policy in charge of price stability. Under this approach, monetary policy is not intended to act to mitigate

financial stability risks, such as those associated with movements in asset prices, e.g. equities or house prices. Two main reasons are traditionally given for this separation: i) the difficulty of identifying asset price bubbles in real time; ii) the uncertainties associated with a monetary policy that is required to pursue conflicting goals.

Limits of separation

Yet it is important to re-examine this rule in the current environment of low interest rates and a monetary policy using a wide and flexible range of instruments.

The mandate assigned to euro area monetary policy is unambiguous: the primary objective is price stability. However, the Treaty[1] states that "*The ESCB[2] shall contribute to the smooth conduct of policies pursued by the competent authorities relating to the prudential supervision of credit institutions and the stability of the financial system*". In executing this mandate, the Eurosystem already pays close attention to fairly broad financial aggregates when determining its monetary policy stance. For example, it tracks debt trends among households, companies and financial intermediaries.

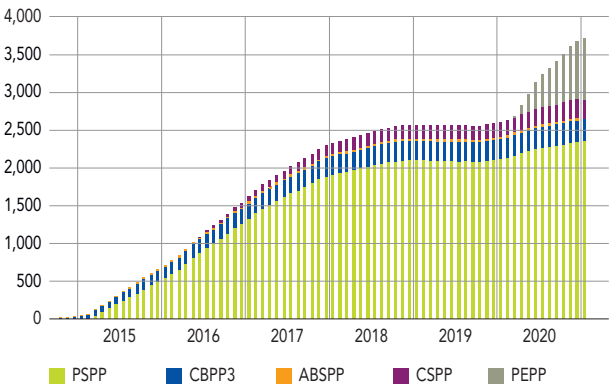
In 2010, within the Eurosystem, we were faced with the prospects of still-high interest rates with little impact on bank margins, while we had at our disposal inflexible and fairly conventional monetary policy instruments that put a *de facto* limit on the ability of monetary policy to exert influence on financial system risks. In 2021 the Eurosystem's toolbox looks significantly broader with the inclusion of forward guidance on interest rates, the deployment of asset purchase programmes and the introduction of targeted longer-term refinancing operations (TLTROs). In the meantime, the application of persistently accommodative monetary policy may have caused adverse effects for financial stability, including decreased bank profitability owing to ultra-low or even negative interest rates, overly search for yield behaviours by investors in a prolonged low-rate environment, easing of credit standards, increased leverage of non-financial agents as they took on more debt, and excessive risk premium compression in some market segments.

If financial instability were to impact asset prices, the solvency of the most heavily indebted companies and bank balance sheets (through an increase in non-performing loans), many monetary policy transmission channels would be threatened.

In support of a principle of coordination: use the wide array of monetary policy instruments to capture financial stability considerations more effectively

The need to counter the risks to the euro area inflation outlook and the monetary policy transmission mechanism, which have been exacerbated by the Covid-19 crisis, fully justifies a highly accommodative monetary policy. There can be no question of tightening policy in the name of financial stability, as called for by those who advocate for "leaning against the wind". The Eurosystem must seek to use instruments with the fewest adverse effects for financial stability, while potentially even introducing ad hoc mechanisms to mitigate such effects. To give an example, the *tiering* mechanism, under which a portion of excess reserves held by banks with the Eurosystem earn a higher rate of interest than the deposit facility rate, offers a way to exempt a portion of banks' excess reserve holdings with the Eurosystem from negative interest rates and to reduce the compression of net interest margins, so safeguarding the profitability of the banking sector in the low interest rate environment. Application of this mechanism allows monetary policy to target price stability without undermining financial sector stability.

C1 Asset purchase programmes conducted by the Eurosystem
(outstanding amounts in EUR billions)



Source: European Central Bank.
Note: PSPP: Public sector purchase programme. CBPP: Covered bond purchase programme. ABSPP: Asset back securities purchase programme. CSPP: Corporate sector purchase programme. PEPP: Pandemic emergency purchase programme.

1 Article 127(5) of the Treaty on the Functioning of the European Union.

2 European System of Central Banks.

In another example, TLTROs, which carry extremely low interest rates, exclude home loans to limit the potential contribution of monetary policy to residential property inflation, which would increase the risk of a bubble. Last but not least, the Eurosystem excludes purchases of equities and bank bonds, which could undermine the market discipline of financial institutions.

Integrate monitoring of financial stability risks in the conduct of monetary policy

It is vital, at very least, to continue to prioritise the use of monetary policy instruments that have the least adverse impact on financial stability, assuming identical effects on price stability. But we must also move beyond the traditional principle of keeping monetary and macroprudential policy strictly separate. Without calling into question price stability as the end goal of monetary policy or the role of macroprudential policy as the first line of defence in dealing with financial imbalances that prevent the transmission mechanism from functioning effectively, the conduct of monetary policy should include formal monitoring of financial stability risks, given their importance to monetary policy transmission and the effects on growth and inflation.

Until now, euro area monetary policy has been organised around two pillars: an economic analysis, which assesses the short- to medium-term determinants of economic developments and justifies a target interest rate, and a monetary analysis, whose role has lessened greatly over time but that takes a longer-term view, harnessing information gleaned from the linkage between money supply and prices. The second pillar – monetary analysis – needs to be overhauled and expanded to encompass an analysis that assesses financial imbalances and their subsequent effects on production and inflation: asset prices (property and/or equities) or trends in lending to households and companies could be assessed, for example.

Financial stability considerations would therefore be included as an explicit part of the monetary policy stance and would, in practice, be captured within a single, clear and transparent framework. This framework would have the advantage of formalising the analyses, which are already carried out in practice, that underpin choices in terms of monetary policy instrument combinations; these analyses would be guided by the intent to maximise the impact on inflation while minimising extreme side effects for financial stability.

2 Coordinate macroprudential policy at European and domestic levels to improve effectiveness

Integration of financial stability considerations into euro area monetary policy would need to be adjusted to reflect the geographical reach of the risks associated with identified vulnerabilities and would not call into question the need for macroprudential policy. The national macroprudential framework should still be able to deal with a risk that is confined to a given country. If a risk is specific to one country but could have consequences for neighbours, it should be possible to address this risk through a European macroprudential framework supplementing the domestic one. Meanwhile, a major shared risk for the entire euro area with a material impact on growth and consumer price indices would naturally be addressed by the single monetary policy. To achieve this optimal allocation between monetary and macroprudential policy, however, the macroprudential component needs to be strengthened, first and foremost on the European institutional side.

Institutional arrangements are sometimes too complex for macroprudential policy

Macroprudential policy governance takes various forms around the world: some countries entrust it to a political authority while others rely on their central bank, via a dedicated committee or an interagency committee on which the central bank participates.[3] This vacillation reflects a duality: macroprudential decisions have considerable political sensitivity – think of measures relating to housing loans – while also involving a significant technical element. Political governance thus comes with the risk of inaction while central bank governance may entail the risk of a lack of legitimacy.

Because of this, France uses a combined approach, which it has judiciously adjusted with use. the HCSF, chaired by the Finance Minister, acts as the macroprudential authority in this system; the Governor of the Banque de France sits on the council and has sole power to propose decisions, while the chairs of three French supervisory authorities, the *Autorité de contrôle prudentiel et de résolution* (ACPR – Prudential Supervision and Resolution Authority), the *Autorité des marchés financiers* (AMF – Financial Markets Authority) and the *Autorité des normes comptables* (ANC – Accounting Standards Authority), are also on the council. They are joined by three external members, each of whom is an independent and recognised economist.

The national-level arrangements are supplemented by those at European level. The goal of having monetary

policy do a better job of considering financial stability requires coordination with the European macroprudential framework. This already exists: the European Central Bank (ECB) has top-up powers authorising it to tighten some macroprudential measures adopted by national authorities if these are deemed insufficient. Meanwhile, coordination and cooperation between national authorities is done via the ESRB,[4] which is chaired by the President of the ECB.

Strengthen the European component of macroprudential policy

Specific national features may persist that warrant non-uniform tools (for example in the real estate sector), but a European framework should be synonymous with transparency, enhanced cooperation and greater effectiveness in preventing risks from spreading, particularly in an economic and monetary union. Hence the idea of going further to ensure that financial integration corresponds to making the European financial system more resilient. Yet this must not be at the cost of complexity, which can make it harder to properly identify different parties' responsibilities and or result in cumbersome procedures that might interfere with the agility needed when crises arise.

The recent review of European banking sector regulations raised the level of harmonisation of the macroprudential framework. The European Commission could go even further during the review scheduled for 2022, notably in terms of measures covering borrowers. These measures could be integrated within CRD[5] VI, in order to provide all European Union countries with shared and transparent tools, facilitating their Union-wide adoption and reciprocity: this would represent encouraging progress towards a European macroprudential policy.

The way that macroprudential policy is essentially nationally organised at present is suited only to configurations involving internal shocks. Each country is supposed to be sufficiently equipped to counter these shocks or, in a best-case scenario, anticipate and prevent them. But it should be possible to deal at the European level with a risk that is identified as having systemic features, in order to ensure the financial stability of the entire zone. Such risks are growing increasingly likely owing to the significant interconnectedness of non-bank financial intermediaries and credit institutions within the European financial system. For this, the ECB (or the ESRB) should be given expanded macroprudential powers, based on a set of instruments defined at European level, to provide a platform for responsive and coordinated action. The Covid-19 crisis has highlighted room for improvement in several areas: granted, countercyclical buffers were released, but from quite different starting points; procedures involving European bodies and designed to mobilise certain macroprudential instruments take several months before implementation becomes effective. Experience tells us that this kind of red tape may discourage, without contributing much.

3 Strengthen the macroprudential framework and expand it to non-banks

Overall, the financial system has proved resilient in the Covid-19 crisis thanks to decisive interventions by government authorities, supervisors and central banks. But action in several areas could make the system work even better.

Little appetite for microprudential capital buffers argues for more extensive deployment of macroprudential buffers

Thanks to regulatory reforms introduced in the wake of the 2008 financial crisis, banks had much higher solvency ratios in 2020 than they did during previous crises. This was a decisive advantage, allowing banks to provide sustained financing to non-financial corporations. But solvency ratios were strengthened essentially by deploying capital buffers that authorities cannot release at the bottom of the cycle, unlike the countercyclical buffer.

Several obstacles to the use of microprudential bank buffers were identified, even after supervisory authorities relaxed their requirements, raising challenging questions about "buffer usability". First, banks are keenly attuned to the financial market pressure exerted through investors and credit rating agencies; banks fear that if they draw on their buffers, causing their solvency ratios to deteriorate, they might be stigmatised, with doubts arising about their soundness. Second, banks may be worried that supervisors could put restrictions on dividend payouts if solvency ratios deteriorate further. A third potential reason is linked to uncertainty among banks about coping with future requirements, post-crisis capital rebuilding imposed by authorities and the impact of increased future risks on their

3 Cf. *IMF-FSB-BIS* (2016).

4 European Systemic Risk Board.

5 Capital Requirements Directive.

ratios. We sought to alleviate these concerns at the meeting of the BIS[6] Group of Governors and Heads of Supervision (GHOS), which I chaired in November 2020, by providing clear guidance on the duration of these flexibilities: "*After the crisis, supervisors will provide banks with sufficient time to rebuild their buffers, taking account of economic, market and bank-specific conditions.*"[7]

Prudential authorities therefore had to communicate extensively on the desired use of these buffers or to lower the requirements of some microprudential instruments (for example Pillar 2 Guidance) that were not initially intended to be released countercyclically. The call to draw on buffers must necessarily be made (and was partly made) in a coordinated manner across jurisdictions to prevent the risks of stigma and ensure a global level playing field.

Countercyclical macroprudential buffers must be strengthened without raising the total level of regulatory requirements provided for under the Basel III regulatory framework. This entails making choices between the size of existing buffers and the countercyclical buffer, which is designed to be released during times of stress. Countercyclical buffers that are always available, and hence strictly higher than zero, outside of crisis periods, would be a vital macroprudential tool, not only during crises that are endogenous to the financial system, but also during exogenous shocks, such as the Covid-19 pandemic.[8] The ECB should also be able to release buffers in a uniform and coordinated manner within the euro area, which would provide an effective pan-European macroprudential tool.

In France, we enhanced our credibility by showing that we would not hesitate to release the available countercyclical buffers when this seemed necessary: at my proposal, the HCSF took this step on 18 March 2020. In due course, once the crisis is over, we should also be able to step up use of this instrument. For this, however, the microprudential supervisor, i.e. the ECB via the Single Supervisory Mechanism (SSM) for Europe, must agree to lower its own capital requirements by an equivalent amount, but there are regrettably no signs of this happening.

Establish a macroprudential framework for the non-bank sector

Brisk growth in the financial cycle has paralleled financial regulation efforts at a global level since 2008, spurring, among other things, the emergence of the non-bank financial institution (NBFI) sector. The main non-bank financial institutions are insurance companies, pension funds, money market investment funds and other investment funds. The latter have seen the swiftest business growth, with the total value of assets in this sector swelling globally from EUR 11 trillion in 2008 to EUR 45 trillion in 2019.[9]

Owing to the rise of non-bank intermediation and, in particular, the growth of the investment funds sector, some financial activity has shifted to participants that make up a larger and less uniform population than that of the banking sector, but that respond in many cases to identical trends and whose effects may be procyclical. It is also their degree of interconnectedness that creates the need to develop a macroprudential framework for these participants that captures their systemic nature. Non-bank intermediaries are closely interconnected with each other and with banks, through direct exposures but also indirect exposures, notably via conglomerate structures and shared asset holdings. Moreover, in a low interest rate environment, these participants may have an incentive to hold riskier and less liquid assets while using leverage.

The Covid-19 crisis exposed the vulnerabilities of investment funds, especially money market funds, as well as the shortcomings of existing regulatory frameworks. The market finance sector must be sufficiently resilient to be able to absorb shocks without transmitting them to the wider financial system, much less to the real economy. Central bank action was decisive, notably in providing liquidity to short-term funding markets, in areas where money market funds are most active in normal times and where their withdrawal at the height of the crisis could have had a procyclical impact by eroding the liquidity available to non-financial corporations.

However, there are gaps in the existing prudential framework for money market funds, as it applies solely to the individual situation of each fund and fails to integrate the negative externalities that fund activities entail for the wider financial system. This creates liquidity risks for the real sector, which relies on funds for a growing share of its financing. Primordial improvements to the existing regulations include strengthening liquidity buffers while empowering the regulator to relax these constraints in times of stress: this should form the first line of macroprudential defence, to be used before turning to the central bank's last-resort support. These instruments need to be designed at a European level, given the NBFI sector's significant level of European integration, and in accordance with Europe's goal of building a capital markets union. An international approach would also make sense, given the high level of

interconnectedness and dependency beyond Europe's borders. US authorities should take a more active role in this regard, alongside their European counterparts, to ensure that their asset management industry develops in a manner consistent with financial stability.

In circumstances where the situation of money market funds could pose major risks to growth and price stability in the euro area, monetary policy must be ready to intervene on an exceptional basis. However, implementation of macroprudential measures at European level should be a prerequisite to prevent moral hazard.

Conclusion

The goal of more effectively ensuring financial stability over the coming years is an ambitious project requiring action on three fronts:

- better coordinate macroprudential and monetary policy,
- strengthen the European component of macroprudential banking policy,
- and, most importantly, do a better job of capturing the NBFI sector in the macroprudential policy framework.

Make no mistake: since the global financial crisis of 2008, we have considerably strengthened bank regulation and our macroprudential policies in this sector. But the 2020 crisis showed that a missing link remains in the shape of macroprudential rules and tools for the **non-bank sector**. As this sector grows in importance, it is crucial to mitigate its risks, which concern liquidity much more often than solvency. This is the new frontier that we must cross as we build on progress towards a safer financial system, within Europe and around the world.

6 Bank for International Settlements.

7 GHOS (2020), *Governors and Heads of Supervision commit to ongoing coordinated approach to mitigate Covid-19 risks to the global banking system and endorse future direction of Basel Committee work*, press release, November.

8 In the event of a sharp financial sector reversal, banks would see their requirements decrease further, giving them greater room for manoeuvre to support credit. Similarly, during a phase when risks are accumulating, macroprudential authorities could increase requirements more significantly to make banks more resilient.

9 Estimate for the euro area and 21 other jurisdictions accounting for 80% of global GDP (cf. FSB, *Global monitoring report on non-bank financial intermediation*, 2020).

REFERENCES

Basel Committee on Banking Supervision (2020)
" Governors and Heads of Supervision commit to ongoing coordinated approach to mitigate Covid-19 risks to the global banking system and endorse future direction of Basel Committee work", press release, November: *https://www.bis.org/press/p201130.htm*

Financial Stability Board - FSB (2020)
FSB Global monitoring report on non-bank financial intermediation 2020, December: *https://www.fsb.org/2020/12/global-monitoring-report-on-non-bank-financial-intermediation-2020/*

International Monetary Fund, FSB, Bank for International Settlements (2016)
Elements of Effective Macroprudential Policies, Lessons from International Experience, August: *https://www.imf.org/external/np/g20/pdf/2016/083116.pdf*

MACROPRUDENTIAL STRESS TESTING UNDER GREAT UNCERTAINTY

Luis de GUINDOS

Vice-President
European Central Bank

NB: The author would like to thank Cosimo Pancaro (ECB, DG Macroprudential Policy and Financial Stability) for his contribution to this article.

First used as a crisis solution tool to identify and quantify capital shortfalls, stress testing gradually became a prevention tool, aimed at identifying vulnerabilities in the financial system. Because stress testing exercises accommodate a broad range of scenarios, they provide regulators with answers on questions with a high degree of uncertainty like the Covid crisis. Two types of stress testing exercices coexist: microprudential ones, which aim at identifying individual banks vulnerabilities, and macroprudential ones, which consider the banking sector as a whole. The latters incorporate banks dynamic adjustements, the interaction between banks and the real economy, and the interconnection with non-banks. New directions for macroprodential stress testing include the climate risk, and the modelling of interactions between individual institutions.

First used as a crisis solution tool to identify and quantify capital shortfalls and enhance market discipline, stress testing has gradually become a prevention tool, aimed at identifying vulnerabilities in the financial system. In 2020 a number of authorities, including the European Central Bank (ECB), relied on stress testing exercises to evaluate the impact of the coronavirus (Covid-19) outbreak on bank solvency and to inform the appropriate policy decisions. Stress tests are particularly suited to the current circumstances, which feature a high degree of uncertainty about future economic developments. This is because stress-testing exercises can provide policymakers with an understanding of how a range of different economic scenarios and policies may affect bank solvency.

To assess individual banks' capital adequacy, supervisory authorities rely on two complementary stress test perspectives: bottom-up and top-down, for which either banks or the authorities compute capital shortfalls. In contrast, the macroprudential approach assesses the resilience of the banking sector as a whole. It extends traditional stress testing at three levels: banks' dynamic adjustment to macrofinancial developments, the interaction between banks and the real economy and the interconnections between banks and non-bank financial institutions. Stress testing can be a multipurpose tool. For example, the ECB uses its macroprudential stress-testing framework to assess the impact of banking sector regulations and to inform the calibration of macroprudential policies such as capital buffers. New directions for macroprudential stress tests include the development of tools to account for climate risk and to tackle interactions between individual institutions within the financial sector.

1 The development of stress testing as a policy tool

Since the financial crisis, stress tests have become an important tool for central banks and banking supervisors and have been used for different policy purposes (de Guindos, 2019a).

During the financial crisis, stress tests were used mainly to identify and quantify capital shortfalls in the banking sector and enhance market discipline. This was achieved by publishing consistent and granular bank-level data and by requiring banks to fill capital shortfalls identified in the stress test if their capital ratios fell below a pre-defined pass/fail threshold.

The way stress tests are used has evolved since the crisis, both in Europe and globally. They have become a key part of the supervisory and financial stability toolkit to assess risk profiles and performance under adverse macroeconomic conditions.

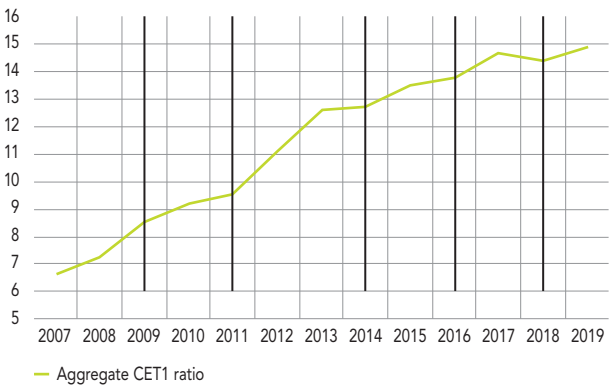
In recent years, stress tests have been used for crisis prevention purposes. The aim has been to identify vulnerabilities in the financial system and assess the resilience of the banking sector and individual banks to adverse macrofinancial shocks, thereby informing supervisory evaluations and macroprudential policy decisions and calibrations.

In Europe, the biennial EU-wide stress tests coordinated by the European Banking Authority (EBA) contribute significantly to the ECB's Supervisory Review and Evaluation Process (SREP).[1]

In other words, rather than finishing with a pass or fail assessment, stress tests now provide a starting point, both for discussions between banks and supervisors and for macroprudential policymakers.

Overall, the various European stress tests conducted since the crisis have been instrumental in improving the capitalisation, and therefore the resilience, of the euro area banking sector. The Common Equity Tier 1 (CET1) ratio of euro area significant institutions increased from less than 7% in 2007 to almost 15% in 2019 (*see Chart 1*). The enhanced resilience is also reflected in gradually higher

C1 Aggregate CET1 ratio of euro area significant institutions
(%)



Sources: European Central Bank, S&P Global Market Intelligence.
Notes: Based on publicly available data for an unbalanced sample of significant institutions (2007-14) and on published supervisory statistics (2015-19).
Vertical lines indicate the EU-wide stress tests since 2009.
CET1: Common Equity Tier 1, EU: European Union.

levels of "stressed" CET1 ratios when comparing the results of the 2014, 2016 and 2018 stress tests.[2]

The EU-wide stress tests follow a constrained bottom-up approach, which involves significant input from the banks. Under this approach, banks generate their stress test projections using their own models. These projections are based on a macrofinancial scenario – provided by the European Systemic Risk Board (ESRB) – which is the same for all banks and on a predefined methodology provided by the EBA.

The constrained bottom-up approach has several advantages. In particular a bottom-up approach should also support banks' own risk management capacity by requiring them to consider in-house how severe adverse circumstances may affect their solvency. It should strengthen their ability to detect vulnerabilities and encourage them to develop their own internal stress-testing models.

However, the constrained bottom-up approach also has some limitations. The static balance sheet assumption[3] limits the realism of the exercise as it does not account for how banks would respond under stressed situations. Certain constraints imposed by the stress test methodology may also make the outcome of the stress test less realistic. Furthermore, this approach also gives banks substantial scope to materially underestimate their vulnerability to adverse circumstances and thus to "game" the exercise.[4]

Consequently, European supervisors conduct a thorough quality assurance of banks' bottom-up stress test results to ensure that the outcomes are credible. In particular, banks are presented with independent model-based estimates through a top-down model challenge. This process generally leads to individual banks revising their stress test outcomes before publication.

The extensive supervisory scrutiny, which also involves the top-down model challenge and has so far taken the form of a dialogue between supervisors and banks, plays an important role in disciplining banks and reducing the incentives for them to systematically underestimate their vulnerabilities.[5]

Notably, the European supervisory community is currently discussing the possibility of reforming the existing set-up of the EBA EU-wide stress test exercises with a view to overcoming some of the drawbacks mentioned above. In particular, the aim would be to make the stress tests more realistic and the quality assurance process more efficient, while preserving comparability and conservatism.

In the next section I will provide details on how stress testing has been used at the ECB to assess the vulnerability of the euro area banking sector during the Covid-19 crisis and to inform the necessary policy considerations in the challenging and highly uncertain situation that characterised the first half of 2020. I will highlight the benefits which stemmed from its use and the challenges that were faced during its implementation.

2 The 2020 ECB vulnerability analysis

In 2020, as a consequence of the outbreak of the Covid-19 pandemic, the planned EU-wide stress test was postponed until 2021. Due to this, the ECB – in cooperation with Single Supervisory Mechanism (SSM) national competent authorities (NCAs) – carried out a centralised top-down stress test of 86 banks under SSM direct supervision, encompassing about 80% of total assets in the euro area, to identify potential vulnerabilities within the banking sector at an early stage.[6, 7]

1 The ECB Banking Supervision takes into account both the qualitative results (quality and timeliness of banks' submissions) and the quantitative results (capital depletion and banks' resilience under the adverse scenario) when setting Pillar 2 capital requirements and Pillar 2 capital guidance during the SREP. In addition to the EBA exercise covering the largest euro area banks, the ECB conducts, in parallel, a stress test for the remaining significant institutions that it directly supervises.

2 The average final CET1 ratio under the adverse scenario in 2018 stood at 9.9%, up from 8.8% in the 2016 stress test (for 33 banks, on a fully loaded CET1 basis). The final average CET1 ratio in the adverse scenario in 2016 was higher at 9.1%, compared to 8.6% in the 2014 Comprehensive Assessment Stress Test (for 37 banks, on a transitional CET1 basis).

3 The static balance sheet assumption implies that banks maintain a constant balance sheet and the same business mix and model over the stress test horizon. Instead, the dynamic balance sheet assumption, which is generally applied in macroprudential stress tests, implies that banks are allowed to adjust their balance sheets in response to the macroeconomic and financial developments over the stress test horizon.

4 For empirical evidence of the "gaming" behaviour of banks participating in the stress test, see Philippon et al. (2017); Niepmann and Stebunovs (2018); Quagliariello (2019) and Kok et al. (2019).

5 In fact, recent empirical evidence suggests that the comprehensive intrusion associated with the ECB stress test quality assurance process has a disciplinary effect on banks' risk-taking after the stress tests (see Kok et al., 2019). For related evidence in a US context, see Acharya et al. (2018) and Hirtle et al. (2019).

6 The methodology used in this exercise was compliant with the EBA methodology used in the EU-wide stress test. Accordingly, the static balance sheet assumption was applied.

7 Baudino (2020) provides an illustration of the use of stress-testing by different authorities during the Covid-19 crisis.

The exercise was carried out by exploiting supervisory data and relying on three scenarios: (i) the EBA 2020 stress test baseline scenario, which was defined before the Covid-19 outbreak and was used as a benchmark to better assess the impact of the coronavirus crisis; (ii) a Covid-19 central scenario; and (iii) a Covid-19 severe scenario outlined in the June 2020 Eurosystem staff macroeconomic projections. The two latter scenarios included, to a certain extent, the impact of the monetary, supervisory and fiscal relief measures taken in response to the coronavirus crisis.[8] Under the central scenario banks' aggregate CET1 ratio was depleted by approximately 1.9 percentage points to 12.6% while under the severe scenario it was depleted by 5.7 percentage points to 8.8% by end-2022. Overall, the results showed that the euro area banking sector can withstand the pandemic-induced stress and continue to fulfil its role of lending to the economy. However, if the severe scenario were to materialise, the depletion of bank capital could be significant for some banks.

This exercise allowed the ECB to publish a timely assessment of the banking sector as a whole. The results of the stress test were also used to inform the ECB's efforts to address the current crisis, both on the microprudential and macroprudential side. Furthermore, publication of the results reduced uncertainty and helped investors to maintain confidence in the soundness of the euro area banking sector and its ability to continue to support the real economy. It also provided banks with an indication as to the ECB's view on the likelihood of potential solvency risks and its expectations about the evolution of banks' main balance sheets and profit and loss items.

The unusual nature of the current crisis made the implementation of the 2020 ECB vulnerability analysis particularly challenging.

For the first time the ECB carried out and published the aggregate results of a granular top-down stress test conducted without the involvement of banks. While this approach ensured the timeliness of the exercise in these extraordinary circumstances and helped to free up bank resources, which are normally involved in the EU-wide stress tests, it meant that the ECB had to rely on a smaller set of information to conduct its analysis. The ECB could not exploit the data that are regularly submitted by banks in the course of EU-wide stress test and also could not interact with banks during the exercise. Furthermore, the design of the scenario was particularly complex due to the high uncertainty surrounding near-term economic developments. To mitigate this concern, the ECB relied on two Covid-19 scenarios in the analysis rather than the usual single adverse scenario.

A further element of complexity stemmed from the need to include policy responses in the analysis – this differs from the standard practice in stress tests. Such an approach was necessary as exceptional support measures across different policy domains were introduced very soon after the pandemic crisis started. These measures needed to be included to obtain a more realistic estimate of the impact of the Covid-19 outbreak. However, including them was not without practical challenges: it required making assumptions about the effectiveness of the measures, their possible extension and the potential situations that may arise upon withdrawal or expiration of these measures.

Having illustrated how the use of stress tests has changed over time and how the ECB has used this tool so far during the Covid-19 crisis, I will use the following section to focus in more detail on how comprehensive, system-wide exercises could inform macroprudential analysis by incorporating amplification effects caused by interbank contagion or feedback loops between the real economy and the financial sector.

3 Macroprudential stress testing the banking sector at the ECB

Macroprudential stress tests build on supervisory exercises by providing a perspective on the banking sector as a whole, rather than focusing solely on the resilience of individual banks. This involves extending the standard stress-testing framework at three levels.

First, macroprudential stress tests account for banks' reactions to macroeconomic and financial developments. They enable relaxation of the static balance sheet assumption. This allows banks to adjust assets, liabilities and prices. Macroprudential stress tests also take account of possible interactions between banks' solvency and their funding costs.[9]

Second, macroprudential stress tests allow to take into account the interconnections between financial institutions and the related endogenous transmission channels of systemic risk, such as fire sales and contagion effects.

Finally, macroprudential stress tests can incorporate interactions between the financial sector and the real economy. In this respect, their results can not only provide information on the system-wide capital depletion under adverse scenarios but also insights into the sector's ability to withstand adverse developments without disrupting the flow of credit to the real economy.

In recent years the ECB has developed a large semi-structural macroprudential stress-testing model (Budnik, 2019; Budnik et al., 2019) which captures the joint dynamics of the 19 euro area economies and of the circa 100 largest individual euro area banks. The model is being further developed in collaboration with Eurosystem central banks.

In this model banks can endogenously adjust the size and composition of their balance sheets, modify their dividend policies and reset their interest rates on loans and deposits in response to economic conditions and depending on their individual characteristics (such as solvency, asset quality, profitability and balance sheet structure). In addition, the model features the two-side interdependency between the financial sector and the real economy and the related non-linear amplification mechanisms, as illustrated in Diagram 1.

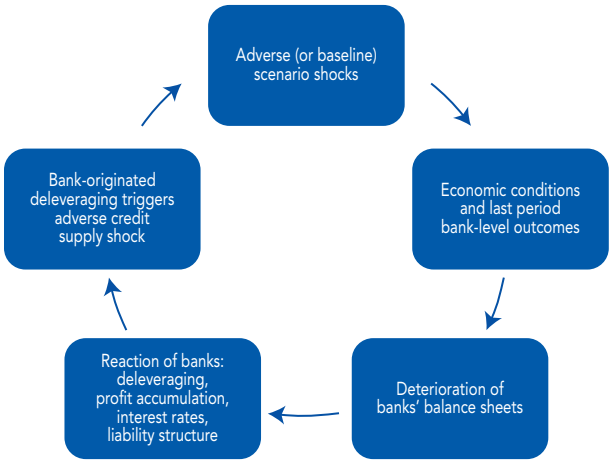
The model supports a biennial assessment of the resilience of the banking system from a macroprudential perspective, complementing the regular supervisory stress test. For instance, in 2018 the macroprudential stress test revealed a higher level of system-wide capital depletion in nominal amounts in the adverse scenario compared with the results obtained under the static balance sheet assumption. However, because of banks' deleveraging, CET1 ratios were on average higher in the macroprudential stress test. The loan growth of a significant proportion of banks in the adverse scenario appeared negative, especially in the case of credit to non-financial corporations.

In addition to results based on the original adverse scenario, the macroprudential stress test provided an estimate of second-round effects on economic output. The feedback loop between the real economy and the banking sector and the related amplification could deduct an additional 1.6% from euro area output. In the cross-country perspective illustrated in Chart 2, the amplification mechanism was more pronounced for those countries with banking systems that had relatively low levels of capitalisation at the beginning of the scenario horizon.

This macroprudential stress-testing framework can also be used to analyse the medium-term prospects of banking sector policies. It was recently used in combination with a "Growth-at-risk" approach to assess the macroeconomic costs and benefits of the finalisation of the Basel III framework in cooperation with the EBA (*see EBA, 2019*).

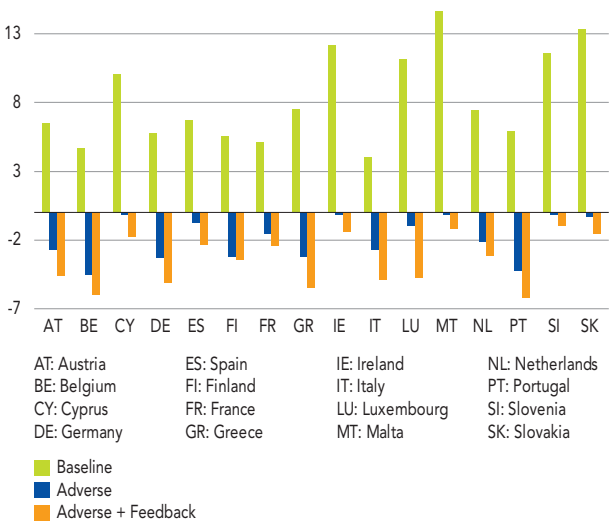
In this analysis, macroeconomic costs are measured in terms of lower expected Gross Domestic Product (GDP) growth under baseline conditions resulting from the introduction

Diagram 1 The stylised representation of the real economy-financial sector amplification mechanism in the ECB macroprudential stress test model



Source: European Central Bank (ECB).

C2 Cumulative Gross Domestic Product (GDP) growth in the 2018 scenarios: baseline, adverse and the adverse with feedback
(%, cumulative GDP growth)



Source: Budnik et al. (2019).

8 The Covid-19 central scenario was considered the most likely to materialise. It featured an unprecedent fall in euro area real Gross Domestic Product in 2020 and a rebound in 2021 and 2022 as medical solutions become available. The Covid-19 severe scenario represented a more adverse, but still plausible development of the crisis, due to a strong resurgence of infections and an extension of strict containment measures until mid-2021. For further details see ECB (2020a).

9 On the relationship between banks' solvency and funding costs, see Arnould et al. (2020).

of the Basel III finalisation package due to the possible transitory reduction in bank lending. The benefits are instead measured in terms of the expected reduction in the decrease of GDP growth under adverse conditions due to the improved capacity of the banking sector to grant credit to the real economy resulting from the introduction of the Basel III finalisation package.

The results of the analysis show that the implementation of the Basel reforms will result in modest transitional costs, which will fade over time. The long-term benefits will be substantial and will outweigh the modest transitory costs. The reforms would mitigate the severity of future economic downturns through a reduction in both the probability and intensity of future banking crises, leading to sizeable long-term net benefits.

This analytical framework can also support the calibration of macroprudential policies. For instance, it can assess the costs and benefits and the impact of timing of introducing macroprudential capital buffer requirements. In terms of the benefits, the framework can quantify how a better capitalised banking sector makes it possible to maintain a smooth provision of credit to the real economy over the cycle. This should be weighed against the (transitory) cost of introducing new requirements which, in turn, may vary over the cycle. When the new policy is phased in under normal conditions, banks are able to build up additional capital by retaining their profits, and do not need to reduce lending to improve capital ratios. However, the phase-in of a new capital policy at the beginning of a slowdown is likely to trigger a reduction in credit and put an additional drag on the economy. Bad timing aggravates the costs of macroprudential and regulatory interventions, and can limit their effectiveness.

The macroprudential stress test framework re-interpreted within the growth-at-risk approach to systemic risk can thus provide intuitive and consistent cost-benefit analyses of regulation and policies. An integrated model delivers comparable metrics, details transmission channels and allows policy makers to differentiate between short-term and medium-to-long term effects. Such a model is complex and resource intensive but it relies on a limited number of assumptions and does not rely on rare events that are very difficult to measure with precision such as systemic crises to deliver its impact assessment.

Furthermore, the ECB is in the process of adapting its macroprudential stress-testing framework so that climate-related risks can also be assessed. Climate change has the potential to affect many parts of an economy and, consequently, the financial system. Macroprudential stress testing appears well suited to the analysis of risks such as extreme weather events, structural changes triggered by gradually increasing temperatures and the impact of remedial policy measures.

There are two dimensions to this work. The first is a pilot stress test focusing on the materiality of transition risks for banks' solvency and lending capacity, and their implications for the overall economy (de Guindos, 2019b). Such risks relate to either the belated introduction of environmental policies or the sudden phase-in of new technological solutions. The second relates to the more ambitious goal of assessing the importance of physical risks for the banking sector and investigating the interaction between transition risks and physical risks.

4 Macroprudential stress testing: accounting for interactions between banks and non-banks

While the ECB's stress-testing activities have mostly focused on the banking sector, it is important to look further than banks and consider the broader financial system. Understanding the reaction of the whole financial system to an adverse macrofinancial shock scenario is crucial for policymakers and financial market participants. This is of particular importance given the material growth of the non-bank financial sector in recent years and the potential risks from this part of the financial system.[10] There is a growing body of literature that studies interconnections between the different channels and layers of financial markets, with a strong case being made for the joint integration of stress tests.[11] System-wide stress-testing models aim to fulfil this demand and many central banks and academics are currently developing such models.

Currently, there are only a few documented system-wide stress test models with different types of agents. Finding complete and consistent data for mapping and analysing the financial network remains a key challenge. As a result, existing papers on system-wide stress testing mostly use simulated data or focus on aggregate data for financial entities (e.g. using one representative bank, one representative insurer, etc. as in Aikman et al., 2019).

Along these lines, ECB staff built a model to study relevant interactions in the euro area market-based financial system. The core of the model is a set of representative agents, namely banks, insurance companies, pension

funds, investment and hedge funds, and the central bank. These agents interact in asset, funding and derivatives markets, and endogenously reallocate portfolios according to their investment horizon, regulatory constraints and optimising behaviour.

The model was used recently to investigate the possible effects of large-scale euro area corporate bond rating downgrades amid the Covid-19 crisis (di Iasio et al., 2020). In the simulations, these shocks affect market prices and risky assets are traded with a large discount. While banks' and insurance companies' reactions are still orderly, large outflows from investment funds amplify the system's response to shocks and explain most losses throughout the euro area financial system. This validates the ECB's view that the resilience of the non-bank financial sector – and the asset management industry in particular – needs to be enhanced in a way that reflects macroprudential perspectives.[12]

This approach with aggregated sectors doesn't capture important dynamics related to interconnectedness among individual entities and network effects. Thus ECB staff members are currently working with staff from the euro area national central banks to develop an analytical stress-testing framework that can capture the interactions between banks and non-bank financial institutions by using a range of granular datasets. This new framework is intended to allow staff at the ECB and National Competent Authorities (NCAs) to assess the impact of an adverse macrofinancial scenario on individual financial entities and on the financial system as a whole. The framework features direct and indirect contagion mechanisms, liquidity and solvency interactions, dynamic balance sheet developments and related reactions of the different financial institutions that may in turn lead to material amplification effects. The new framework should help reveal vulnerabilities in the non-bank financial sector and assess the potential for spillovers – most notably due to fire sales – between institutions and between sectors (e.g. between banks, investment funds and insurance corporations).

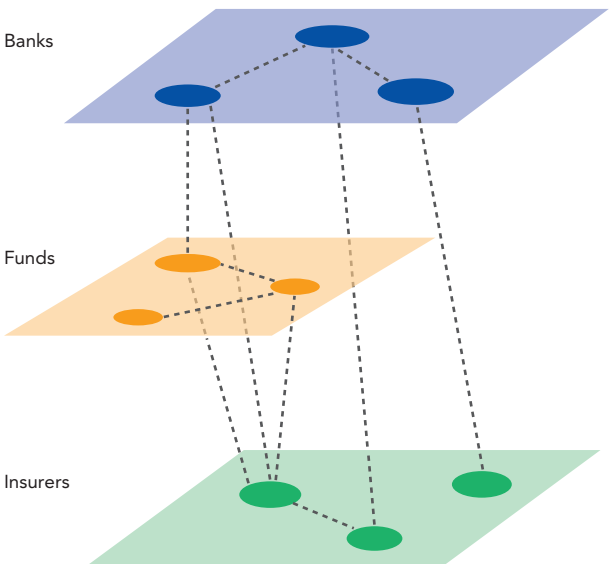
The perspective used in this ECB framework considers systematic risk, meaning that there is a common (macrofinancial) shock that would affect a large range of firms. Thus, this system-wide stress-testing model aims to assess the risk of a systemic event. This contrasts with the European supervisory authorities' stress tests, which in most cases concentrate on the solvency risk for individual entities, whereas work by the ECB focuses on the soundness of the financial system as a whole.

This ECB framework aims to reduce the scope for underestimating systemic risk on the basis of explicit and detailed modelling of contagion risk caused by the existence of relationships in the financial network (*see Diagram 2*).

In this framework, the scenario yields defaults in the non-financial part of the system combined with a redemption shock on investment funds.

The ECB framework considers mostly regulatory constraints for banks and funds (*see also Cont and Schaaning, 2017*), and other agents may perform specific operations in order to reach institution-specific targets. These targets may themselves evolve, reflecting strategic decisions. In the final step, a statistical distribution of results is obtained from the set of simulation outputs. In particular, the framework measures systemic risk, performing a posterior analysis of the different vectors of contagion and assessing the contribution of the different sectors.

Diagram 2 Illustration of relationships within the financial network



Source: European Central Bank.

10 See, for example, ECB (2020b).

11 See, for example, Calimani et al. (2019); Chrétien et al. (2020); Halaj (2018); Mirza et al. (2020) and Timmer (2018).

12 See, for example, Pires (2019).

Given its complexity, the calibration of the model involves a large set of parameters. Therefore, the model is kept very modular in its implementation, making it easy to change key parameters or exclude certain mechanisms in order to perform sensitivity tests.

Conclusion

Since the financial crisis, stress tests have become an increasingly important policy tool. Accordingly, they have been used by different authorities, including the ECB, also during the Covid-19 crisis.

Macroprudential stress tests can be used to assess the extent to which the financial sector can withstand adverse macrofinancial developments without reducing the extension of credit to the real economy. They therefore serve a broad financial stability purpose, making it possible to assess the resilience of the financial system as a whole. They can also be used to perform counterfactual impact assessments and thereby inform discussions on macroprudential policy and financial regulatory initiatives.

In this context, and with a view to supporting its macroprudential policy assessments, the ECB has developed its own macroprudential stress-testing frameworks focusing on both the time dimension of systemic risk (i.e. real-financial feedback loops) and the cross-section dimension of systemic risk (i.e. contagion effects due to interconnectedness). While significant analytical progress has been achieved in recent years, much remains to be done. Substantial resources are devoted to further developing such tools; especially with a view to confidently assessing climate-related financial stability risks and the interactions between banks and non-banks and with the real economy.

REFERENCES

Acharya (V. V.), Berger (A. N.) and Roman (R. A.) (2018)
"Lending implications of U.S. bank stress tests: costs or benefits?", *Journal of Financial Intermediation*, Vol. 34, pp. 58-90.

Aikman (D.), Chickanov (P.), Douglas (G.), Georgiev (Y.), Howat (J.) and King (B.) (2019)
"System-wide stress simulation", *Bank of England Working Paper*, No. 809: *https://www.bankofengland.co.uk/*

Arnould (G.), Pancaro (C.) and Żochowski (D.) (2020)
"Bank funding costs and solvency", *ECB Working Paper Series*, No. 2356.

Baudino (P.) (2020)
"Stress-testing banks during the Covid-19 pandemic", *FSI Briefs*, No. 11: *https://www.bis.org/*

Budnik (K.) (2019)
"A bird's-eye view of the resilience of the European banking system: results from the new macroprudential stress test framework", *ECB Macroprudential Bulletin*, No. 7: *https://www.ecb.europa.eu/*

Budnik (K.), Mozzanica (M. B.), Dimitrov (I.), Groß (J.), Hansen (I.), Kleemann (M.), Sanna (F.), Sarychev (A.), Siņenko (N.), Volk (M.) and Covi (G.) (2019)
"Macroprudential stress test of the euro area banking system", *ECB Occasional Paper Series*, No. 226: *https://www.ecb.europa.eu/*

Calimani (S.), Hałaj (G.) and Żochowski (D.) (2019)
"Simulating fire sales in a system of banks and asset managers", *Journal of Banking and Finance*, forthcoming: *https://www.sciencedirect.com/*

Chretien (E.), Darpeix (P.-E.), Gallet (S.), Grillet-Aubert (L.), Lalanne (G.), Malessan (A.), Novakovic (M.), Salakhova (D.), Samegni-Kepgnou (B.) and Vansteenberghe (E.) (2020)
"Exposures through common portfolio and contagion via bilateral cross-holdings among funds, banks and insurance companies", *HCSF Occasional Paper* : *https://www.economie.gouv.fr/*

Cont (R.) and Schaanning (E.) (2017)
"Fire sales, indirect contagion and systemic stress testing", *Norges Bank Working Paper Series*, No. 2: *https://www.norges-bank.no/*

de Guindos (L.) (2018)
"The ECB and financial stability", speech at the joint National Bank of Belgium, Toulouse School of Economics, Solvay Brussels School of Economics and Management and European Central Bank colloquium, Brussels, 5 November: *https://www.ecb.europa.eu/*

de Guindos (L.) (2019a)
"The evolution of stress-testing in Europe", speech at the annual US-EU Symposium organised by the Program on International Financial Systems, Frankfurt, 4 September: *https://www.ecb.europa.eu/*

de Guindos (L.) (2019b)
"Implications of the transition to a low-carbon economy for the euro area financial system", speech at the European Savings and Retail Banking Group Conference on "Creating sustainable financial structures by putting citizens first", Brussels, 21 November: *https://www.ecb.europa.eu/*

di Iasio (G.), Alogoskoufis (S.), Kordel (S.), Kryczka (D.), Nicoletti (G.) and Vause (N.) (2020)
"System-wide stress in the Euro area: the Covid-19 crisis", European Central Bank, *mimeo*.

European Banking Authority – EBA (2019)
"Basel III reforms – Impact study and key recommendations": *https://www.eba.europa.eu/*

European Central Bank – ECB (2020a)
"Eurosystem staff macroeconomic projections for the euro area, June": *https://www.ecb.europa.eu/*

ECB (2020b)
Financial Stability Review, November: *https://www.ecb.europa.eu/*

Hałaj (G.) (2018)
"Agent-based model of system-wide implications of funding risk", *ECB Working Paper Series*, No. 2121: *https://www.ecb.europa.eu/*

Hirtle (B.), Kovner (A.) and Plosser (M.) (2019)
"The impact of supervision on bank performance", *Federal Reserve Bank of New York Staff Reports*, No. 768: *https://www.newyorkfed.org/*

Kok (C.), Müller (C.) and Pancaro (C.) (2019)
"The disciplining effect of supervisory scrutiny on bank risk taking: evidence from the EU-wide stress test", *ECB Macroprudential Bulletin*, No. 9: *https://www.ecb.europa.eu/*

Mirza (H.), Moccero (D.), Palligkinis (S.) and Pancaro (C.) (2020)
"Fire sales by euro area banks and funds: what is their asset price impact?", *Economic Modelling*, Vol. 93, pp. 430-444: *https://www.sciencedirect.com/*

Niepmann (F.) and Stebunovs (V.) (2018)
"Modeling your stress away", *International Finance Discussion Papers*, No. 1232, Board of Governors of the Federal Reserve System: *https://www.federalreserve.gov/*

Philippon (T.), Pessarossi (P.) and Camara (B.) (2017)
"Backtesting european stress tests", *NBER Working Paper*, No. 23083: *http://www.nber.org/*

Pires (F.) (2019)
"Non-banks in the EU: ensuring a smooth transition to a Capital Markets Union", *SUERF Policy Note*, No. 103: *https://www.suerf.org/*

Quagliariello (M.) (2019)
"Are stress tests beauty contests? (And what we can do about it)", *EBA Staff Paper Series*, No. 4: *https://eba.europa.eu/*

Timmer (Y.) (2018)
"Cyclical investment behavior across financial institutions", *Journal of Financial Economics*, Vol. 129, No. 2, pp. 268-286: *https://www.sciencedirect.com/*

LESSONS FROM COVID: A MACROPRUDENTIAL FRAMEWORK FOR THE MARKET-BASED FINANCE SECTOR

Gabriel MAKHLOUF

Governor
Central Bank of Ireland

The shock from Covid-19 – although not originating **from** the financial system – represents the greatest challenge **for** the financial system since the global financial crisis (GFC) more than a decade ago. Entering this crisis, the banking sector was in a more resilient place due to reforms since the GFC. But the financial system overall has changed significantly due to an increase in the share of financial intermediation accounted for by parts of the non-bank financial system, in particular by investment funds. The financial dislocations observed at the onset of the Covid-19 shock have highlighted some vulnerabilities in the non-bank sector, and particularly for money market funds and open-ended funds with short redemption periods and exposures to less liquid assets. A key lesson to draw from this shock is the need to develop and operationalise a macroprudential framework for market-based finance. This would be beneficial for the sector as a whole as well as for the stability of the financial system.

The Covid-19 pandemic – and the necessary public health measures taken to contain it – rippled through the global economy and financial markets earlier this year. The resulting shock – although not originating **from** the financial system – represents the greatest challenge **for** the financial system since the global financial crisis more than a decade ago (Makhlouf, 2020). Thankfully, the global economy has started to recover from the depths of the crisis. However, the second wave of the virus poses additional near term challenges, notwithstanding the laudable achievements from those who have made positive progress in developing a vaccine.

Entering this period of extreme uncertainty, the core of the financial system was in a better position to absorb, rather than amplify, shocks. Over the past decade, the resilience of banks has strengthened considerably. On the back of post-crisis regulatory reforms, including the introduction and operationalisation of macroprudential frameworks, banks have higher levels of capital, a better quality of capital and more stable sources of funding. As a result, banks are in a better position to support households and businesses through – and out of – this difficult time.

However, the financial system is now significantly different than before the financial crisis. In recent years, the banking system has seen a gradual decline in its share of total financial intermediation globally. This has been accompanied by an equivalent increase in the share of financial intermediation accounted for by parts of the non-bank financial system.

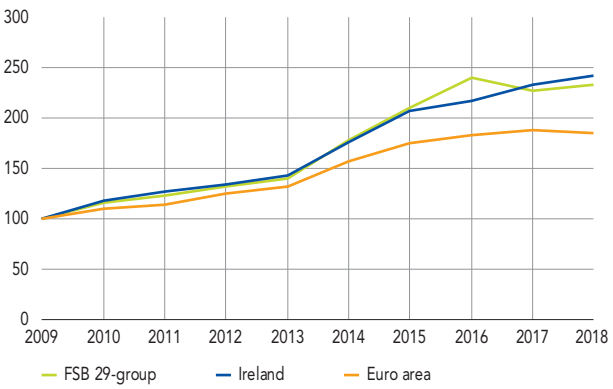
1 The changing financial system

Since the global financial crisis, the world's market-based finance sector has more than doubled in size (*see Chart 1*). At a euro area level, the growth has been somewhat slower. Still, non-bank financial institutions now account for approximately 40% of total assets of the overall euro area financial sector (European Central Bank, 2020).

These structural developments have been at the forefront of the work agenda of the Central Bank of Ireland in recent years. Ireland hosts a large and internationally-oriented market-based finance sector which – similar to global trends – has grown rapidly in recent years. The Irish-resident market-based finance sector is one of the largest globally relative to the size of the domestic economy. Total assets of the sector amounted to over 4.5 trillion euros in the first quarter of 2020. The sector in Ireland is dominated by investment funds and money market funds (MMFs), which together account for roughly two-thirds of total assets.

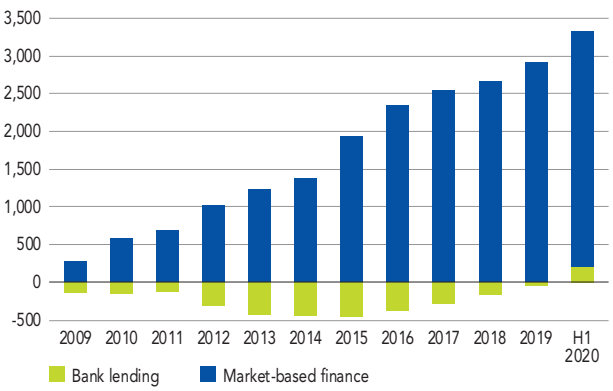
As the market-based finance sector has grown, the importance of this form of financial intermediation for the economy and the financial system has also increased. Compared to a decade ago, potential disruptions in the provision of market-based finance are likely to have a more material macro-financial impact. This is for two reasons. First, because market-based finance provides financing to other parts of the financial system, for example MMFs provide short-term funding to

C1 Comparative growth of the global, euro area and Irish market-based finance sectors, 2009-2018
(index)



Sources: Financial Stability Board (FSB), European Central Bank (ECB) – Statistical Data Warehouse (SDW); Central Bank of Ireland staff calculations.
Note: Index = 100 for base year 2009, based of underlying values in euros.
FSB 29-Group: the group of 29 countries included in the Financial Stability Board's Global Monitoring Report on Non-Bank Financial Intermediation.

C2 Cumulative net bank and market-based financing of euro area non-financial corporations, 2009-H1 2020
(EUR billions)



Sources: European Systemic Risk Board (ESRB), EU Non-Bank Financial Intermediation Risk Monitor 2019*; European Central Bank,* Quarterly Sector Accounts (QSA)*; European Systemic Risk Board (ESRB) calculations.*
Notes: "Market-based finance" includes financing through listed shares, unlisted shares and debt securities. Latest observation Q2 2020.

the global banking system. Second, because market-based finance provides financing directly to the real economy, for example through holdings of non-financial corporate debt. Indeed, after the global financial crisis, an increasing share of euro area non-financial corporation funding has been sourced from market-based sources (*see Chart 2*).

The Central Bank of Ireland has been at the forefront of international efforts to close data gaps and to facilitate a better understanding of the flows and interconnections of the sector. These initiatives have put the Central Bank in a better position to undertake its own risk assessments and to contribute to international exercises that monitor the build-up of vulnerabilities at a global and European level.

2 The benefits of market-based finance

The growth in market-based finance is a positive development. Market-based finance provides a valuable alternative to bank financing and can facilitate risk sharing across the financial system. In doing so, it can support economic activity both in good times and in bad. Deeper and more developed capital markets can facilitate long-term investment, by allowing businesses to access a wider range of funding sources. They can lead to a greater choice amongst savers and investors. Capital markets can also contribute to financing the recovery from Covid-19 as well as the transition to a low-carbon, sustainable and digitalised economy (de Guindos, 2020).

Greater diversification in the channels of financing for businesses and households can be particularly important in the face of adverse shocks. Indeed, there is some evidence to suggest that economies that rely more on market-based finance experience stronger and more durable recoveries from economic crises than those that rely more on bank-based finance (Allard and Balvy, 2011). Indeed many have noted that one of the key benefits of market based finance is that as it is more equity rather than debt based investors inherently take on a risk-sharing role, making the system more resilient (Buch, 2017).

These benefits explain why the European Commission has been working to develop a more diversified financial system in Europe through its Capital Markets Union action plan. Continued progress towards deepening capital markets in Europe is important and not just for the development of our financial system, it would also improve the effectiveness of the European Union's overarching macroeconomic policy framework.

Of course, the efforts to develop capital markets need to be accompanied by policies to deliver **resilient** capital markets. Ones that can provide the benefits of increasing flows of market-based finance to the economy in good times, but which also prove resilient in bad times.

To promote financial stability, policymakers must ensure that the level of resilience in market-based finance is commensurate with its contribution to systemic risk and how it interacts with the financial system and the economy as a whole. Building resilience in market-based finance will ensure that the wider financial system is better placed to absorb, rather than amplify, financial shocks in times of stress.

3 Risks from market-based finance

While market-based finance does bring benefits, like all forms of financial intermediation, market-based finance can contribute to a build-up of financial vulnerabilities. Because of the size, complexity, diversity and the very large number of entities making up the global market-based finance sector, financial policymakers scanning the horizon for risks and vulnerabilities face a foggier terrain.

History can be a useful compass to help as a guide through the fog. Looking at previous episodes of financial stress, two key sources of financial vulnerabilities appear time and time again. The first is excessive leverage. The second is excessive liquidity transformation. And, when shocks hit, they can transmit through interconnectedness between different segments of the financial system.

Some of these underlying vulnerabilities are also present in parts of the market-based finance sector and have been the focus of increased scrutiny in recent years.

Starting with liquidity transformation, vulnerabilities can be present when there is a mismatch in open-ended funds between the liquidity of their assets and the frequency at which investors can access their funds. Such funds can become susceptible to the risk of large redemption requests in times of stress. Funds with significant mismatches may be forced to sell assets at dislocated prices. This as such is a fire sale of assets and may have knock-on effects either directly to the real economy through an impact on wealth, investment, collateral etc. or to other sectors (for example, banks), which can impair the functioning of key markets and, ultimately, the potential flow of credit to the economy.

Excessive leverage in funds can also be a source of vulnerability in periods of stress. When asset prices fall, investment funds may either seek to keep their leverage at a target level by selling assets, or be forced to do so by creditors. Again, this

may lead to fire sales of assets, impacting the markets in which they invest and potentially a withdrawal of funding from other systemically important sectors (e.g. banks). Both of these channels can impair the functioning of key markets. Indeed, leverage can amplify liquidity risks. For example, funds with high levels of leverage through derivatives may be more susceptible to margin calls in times of stress, putting pressure on their liquidity position. In times of stress, this pressure can occur at the same time as the fund is experiencing rising liquidity pressures through increased redemption requests.

At the core of these vulnerabilities is the potential for "fire-sale externalities". Actions that individual actors in the financial system might take in times of stress, which are perfectly rational from their own individual perspective, but can also have adverse implications for the markets in which they invest and the broader functioning of financial markets. Fire-sales can have broader market impacts and, in doing so, also influence the behaviour of other investors that are sensitive to price movements. Such dynamics can increase procyclicality within the financial system.

Finally, interconnections abound in the market-based finance sector. Many of these interconnections take place on a cross-border basis and funds provide financing to other parts of the financial sector. Some unit-linked insurance products invest directly in investment funds. Investment funds and insurers hold shares in MMFs for liquidity management purposes. Funds – for example those that invest in commercial real estate – borrow directly from banks. There are interconnections between different parts of the financial system through derivatives. And, of course, there are potential spillover channels through common asset exposures of investment funds, insurers, pension funds and banks. This means that shocks to parts of the market-based finance sector can transmit to other parts of the financial system and, ultimately, the real economy.

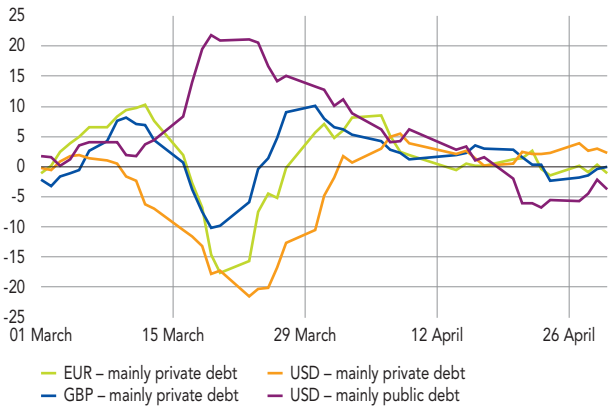
4 The market turmoil at the onset of Covid-19

Covid-19 proved challenging for parts of the market-based finance sector. As financial market turbulence increased, a broad-based "flight to safety" and a heightened demand for cash swept through a range of markets. Around the time a pandemic was declared by World Health Organisation (WHO) in mid-March, the fund sector experienced a sharp increase in redemptions.

Some of the most acute redemption pressures were seen in MMFs. MMFs are typically used by investors, such as non-financial corporates, for cash management purposes and are, in turn, active players in short-term funding markets. MMFs globally – including those in Ireland – experienced a substantial increase in redemptions. For example, US dollar denominated Irish-resident MMFs with investments in private sector debt experienced large outflows in March. In contrast, MMFs with investments in more liquid government debt securities saw large inflows over the same period (*see Chart 3*). Overall, the March episode highlighted that, while MMFs are used by investors as a source of daily liquidity, the money market instruments in which MMFs invest may not be as liquid in all circumstances as investors expect. And although all MMFs managed to meet redemption requests, had MMFs been forced to suspend redemptions, liquidity stresses could have spilled over to other parts of the financial system. The interconnectedness of MMFs with other parts of the financial system – including banks and other non-banks – means their resilience in periods of stress can be systemically important (Central Bank of Ireland, 2020).

These patterns were accompanied by a dislocation in the commercial paper markets in which MMFs invest and spikes in short-term bank funding costs, such as the Libor-OIS[1] spread (Eren, Schrimpf and Sushko, 2020). Irish resident MMFs responded to this period of stress by increasing the liquidity of their portfolios and reducing the maturity of their assets. While this means that MMFs are better placed to meet any future redemption pressures, it also implies that MMFs have only been willing to provide very short-term funding to the banking system. In addition,

C3 Money market fund net redemptions, March-April 2020
(% of NAV – net asset value)

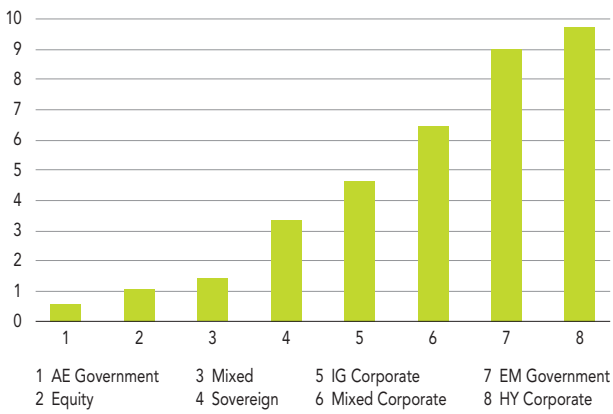


Source: Central Bank of Ireland (2020b).
Notes: This chart presents the 5-day moving average net redemption as a per cent of starting NAV. The weighting given to each fund is based on fund size represented by fund NAV relative to sector NAV. Period of observation 1 March 2020 – 30 April 2020. Funds with mostly private debt includes low volatility net asset value (LVNAV) funds in the stated currencies.

the effects of the pandemic on MMFs in Ireland have persisted (Golden, 2020).

Redemptions were also large in other parts of the broader open-ended funds sector. For Ireland, in aggregate, there were around 72 billion euros of net redemptions from Irish-resident funds in March. The pattern of redemptions across different fund segments suggests that funds with exposures to less liquid assets, or assets that became temporarily illiquid, were particularly susceptible to outflows. It is also noteworthy that redemptions from funds were not necessarily correlated with asset returns. Equity price falls were much larger than falls in corporate bond or emerging market economy (EME) government bond prices. Nevertheless, as a share of assets under management, equity funds experienced much smaller redemptions compared to corporate bond or EME government bond funds (*see Chart 4*). This overall pattern of redemptions would be consistent with the presence of "first-mover advantage" dynamics amplifying redemption pressures in some cases. First mover advantage is a key dynamic in investment funds as these are collective investment vehicles and as such there can be an incentive to investors to redeem early, particularly if the fund has significant investments in illiquid assets. Although the vast majority of funds managed to meet investor redemptions during the Covid-19 shock, the sale of less liquid assets to meet those redemptions requests contributed to the pro-cyclical market dynamics observed over that period (Central Bank of Ireland, 2020).

C4 Outflows in Irish-resident investment funds as a % of previous period's assets under management
(percentage points)



Source: Central Bank of Ireland (2020a); authors' calculations.
Notes: Data as at March 2020. AUM; AE government: advanced economies government bonds; IG corporate: investment grade corporate bonds; EM government: emerging markets government bonds; HY Corporate: high yield corporate bonds.

At the peak of the financial market stress in March, turbulence spilled over to some of the deepest and most liquid government bond markets. Analysis by the Bank for International Settlements (BIS) pointed to evidence of forced selling by hedge funds and other highly-leveraged funds contributing to dislocations in the US Treasury market (Schrimpf, Shin and Sushko, 2020). The sharp increase in asset price volatility led to an increase in margin calls, in turn forcing funds to sell US Treasuries to generate cash. Leverage acted as an amplifying factor. This was an unusual outcome given the historical role of US Treasuries as a recognised safe haven asset (Cunliffe, 2020).

Overall, the market stresses experienced in March, together with the unprecedented scale and speed of central bank intervention required to manage those stresses, have brought to the fore previously identified, structural vulnerabilities relating to some segments of the investment fund sector.

5 One key lesson – the need for a macroprudential framework for market-based finance

One key lesson to take from the experience with the Covid-19 shock is the need to develop and operationalise the macroprudential framework for market-based finance.

In seeking to explain macroprudential regulation, Andrew Crockett previously made the useful analogy of the financial system as a portfolio of individual securities (Crockett, 2000). The macroprudential perspective focuses on the performance of the portfolio as a whole (in this case the financial system). Whereas the microprudential perspective focuses on the individual constituent securities (in this case, individual financial institutions). The macroprudential lens, therefore, places particular emphasis on the likelihood of correlated behaviour by individual financial institutions and the impact of that on the economy when shocks hit. That correlated behaviour may be due to exposure to similar exogenous shocks, similarities in underlying vulnerabilities driving common behaviour in times of stress or externalities from the behaviour of individual institutions, leading to endogenous common shocks.

The potential for collective action problems is the main rationale for a macroprudential perspective in the market-based finance sector.

1 London Interbank Offered Rate-Overnight Indexed Swap.

While some progress has been made in this area in recent years, the macroprudential framework for market-based finance is currently incomplete and not operational. Indeed, compared to the banking sector where the tools are already in place, macroprudential policy for the market-based finance sector remains at an early stage of development.

There are some key questions that will need to be considered in the development of a macroprudential policy framework for market-based finance.

First, what is the appropriate toolkit to target excessive liquidity mismatches and excessive leverage in the market-based finance sector? The business models of market based finance financial institutions, including investment funds, are very different to those of banks, as are the underlying channels through which they can amplify shocks to the economy and financial system.

Second, what is the appropriate balance between time-varying and structural interventions? These questions are still underexplored. For example, a closer alignment between funds' redemption profiles with the liquidity of their underlying assets may address structural liquidity mismatches. At the same time, the pricing of market liquidity risk by financial market participants is time-varying, which may also speak to exploring the possibility of time-varying interventions.

Third, what is the most appropriate approach to international co-ordination in this area? Capital markets are international in their nature and gaps in coverage and co-ordination would limit the effectiveness of macroprudential policy interventions and may lead to regulatory arbitrage. Moreover, the actions by one jurisdiction can have a direct impact on financing conditions of another jurisdiction. So international co-ordination matters.

Fourth, how to consider the appropriate balance between costs and benefits of additional resilience in the market-based sector? The global regulatory reforms to the banking system after the financial crisis involved a detailed cost-benefit analysis co-ordinated by the Financial Stability Board and the Basel Committee on Banking Supervision. And macroprudential actions taken by individual jurisdictions always seek to balance the costs and benefits to the economy. This framework will need to expand to the market-based finance sector. Due to the international and interconnected nature of the sector there are many challenges in developing this approach.

6 Structural reforms with a macroprudential lens – money market funds

Aside from developing and operationalising the overall macroprudential framework for the market based finance sector as a whole, it is also clear that reform of the regulatory framework for MMFs is required. As outlined above, MMFs were significantly impacted at the onset of the Covid-19 shock and given their interconnectedness with other parts of the financial system, their resilience in periods of stress can be systemically important. Despite significant regulatory reforms following the global financial crisis, the Covid market turmoil in March and April 2020 revealed persistent systemic risks from certain types of MMFs, namely those funds that invest in private sector debt securities as opposed to government/public-sector debt.

Similarly to the development of a macroprudential framework for the overall market-based finance sector, any reforms to MMFs will require achieving a balance between maintaining the benefits the sector provides while also increasing the resilience of the sector and ensuring that risks are internalised. Put simply, MMFs provide short-term financing to the economy and provide a cash management service for investors. They do so by undertaking a degree of liquidity transformation. The "price" for this, liquidity risk, as we saw in March 2020, can crystallise rapidly during periods of stress.

Specific reforms will need to be targeted on how to reduce or mitigate this liquidity mismatch, whether, for example they be changes to align the liquidity of the assets with the liability structure of the MMF, or vice versa. Potential reforms will need to be carefully assessed to ensure that balance can be achieved between maintaining the benefits of this sector and increasing its resilience.

Conclusion

A key lesson to take from the Covid-19 crisis this year is to address the gaps in the current framework for market-based finance so as to make it fully operational. The challenges are similar to those faced when developing and operationalising tools for the banking sector. Although there are some additional challenges and considerations when considering market based finance, not least the international nature of the activities and entities involved. The Central Bank of Ireland, in cooperation with international colleagues, is committed to taking forward this important work and developing and operationalising a more comprehensive macroprudential framework to safeguard financial stability.

REFERENCES

Allard (J.) and Balvy (R.) (2011)
"Market phoenixes and banking ducks are recoveries faster in market-based financial systems?", *IMF Working Paper*, WP/11/213: *https://www.imf.org/*

Buch (C.) (2017)
"How can we protect economies from financial crises?", remarks prepared for panel debate at the Rencontres Economiques d'Aix-en-Provence, July: *https://www.bis.org/*

Central Bank of Ireland (2020a)
Financial Stability Review 2020 I *https://www.centralbank.ie/*

Central Bank of Ireland (2020b)
Financial Stability Review 2020 II *https://www.centralbank.ie/*

Crockett (A.) (2000)
"Marrying the micro- and macro-prudential dimensions of financial stability", remarks before the Eleventh International Conference of Banking Supervisors, Basel, 20-21 September: *https://www.bis.org/*

Cunliffe (J.) (2020)
"The impact of leveraged investors on market liquidity and financial stability", remarks prepared for the Managed Funds Association Global Summit 2020, November: *https://www.bis.org/*

de Guindos (L.) (2020)
"Banking union and capital markets union after Covid-19", remarks prepared for the CIRSF (Research Centre on Regulation and Supervision of the Financial Sector, Portugal) online Annual International Conference 2020 on Major Trends in Financial Regulation, November: *https://www.ecb.europa.eu/*

Eren (E.), Schrimpf (A.) and Sushko (V.) (2020)
"US dollar funding markets during the Covid-19 crisis – the money market fund turmoil", *BIS Bulletin*, No. 14, May: *https://www.bis.org/*

European Central Bank (2020)
Financial integration and structure in the euro area: *https://www.ecb.europa.eu/*

European Systemic Risk Board (2019)
Non-Bank Financial Intermediation Risk Monitor, July. *https://www.esrb.europa.eu/*

Golden (B.) (2020)
"The persisting effect of the pandemic on money market funds and money markets", *Central Bank of Ireland Economic Letter*, Vol. 2020, No. 9. *https://www.centralbank.ie/*

Makhlouf (G.) (2020)
"Making the case for macroprudential tools for the market-based finance sector: lessons from Covid-19", remarks prepared for Bruegel online event, June: *https://www.centralbank.ie/*

Schrimpf (A.), Shin (H. S.) and Sushko (V.) (2020)
"Leverage and margin spirals in fixed income markets during the Covid-19 crisis", *BIS Bulletin*, No. 2, April: *https://www.bis.org/*

THE EUROPEAN SYSTEMIC RISK BOARD IN "CRISIS MODE"

Richard PORTES

Professor
London Business School,
Member of the Advisory Scientific Committee (ESRB)

NB: During the period discussed here, the author was Chair of the ESRB Advisory Scientific Committee and had various roles in the work described. This article is written entirely on his personal responsibility, with no implication of any member of ESRB staff or members of the various committees, nor any review by ESRB.

In response to the Covid-19 crisis and while both monetary and fiscal authorities were taking direct and unprecedented measures to curb the adverse consequences of this pandemic shock on the real economy, the European Systemic Risk Board (ESRB), i.e. the European Union macroprudential authority that is responsible for financial stability, swung into action. In particular, the ESRB identified five priority areas: (i) the implications for the financial system of guarantee schemes and other fiscal measures to protect the real economy, (ii) market illiquidity and implications for asset managers and insurers, (iii) impact of procyclical downgrades of bonds on markets and entities across the financial system, (iv) system-wide restraints on dividend payments, share buybacks and other payouts and, (v) liquidity risks arising from margin calls. For each of the topics studied, this article sets out the main risks that were identified by the ESRB as well as the different policy recommendations and further steps that, according to the European Union macroprudential authority, should be taken.

The European Systemic Risk Board (ESRB) is the European Union macroprudential authority, responsible for financial stability: the prevention and mitigation of systemic risk. It was established at the end of 2010. The Chair is the President of the European Central Bank. The decision-making body is the General Board, whose members include all Governors of the 27 central banks of the European Union (EU), a member of the European Commission, the Chairs of the European Supervisory Authorities (ESAs: EIOPA – European Insurance and Occupational Pensions Authority, EBA – European Banking Authority, ESMA – European Securities and Markets Authority), and the Chair and two Vice-Chairs of the Advisory Scientific Committee (ASC). Decisions are normally by consensus, but votes may be taken if a matter is contentious. A quorum of two-thirds of the voting members is required for any decision, even if no vote is deemed necessary. The General Board and its committees and working groups are supported by a relatively small secretariat. The Advisory Technical Committee (ATC), with a very wide membership, discusses matters that might go to the General Board, and the Steering Committee (SC), chaired by the ESRB Chair, prepares General Board meetings.

The ESRB has no executive authority. It may issue recommendations to the ESAs and national regulatory bodies. These are not binding – they have the force of "act or explain". It may also issue warnings and letters to various EU and national institutions, and it publishes reports and research papers.

All this is directly relevant to the way in which the ESRB responded to the economic crisis consequent on the Covid-19 pandemic shock. Its efforts were directed to mitigating the financial stability risks arising from the economic crisis. The global financial crisis (GFC) of 2008-09 was generated endogenously, with a gradual buildup leading to a sharp and wide-ranging disruption of financial markets and institutions. The effects on output and employment were not as deep and immediate as those of 2020. The current crisis came from an exogenous shock, whose economic effects (both direct and arising from policy responses) have had actual and potential financial repercussions. In both cases, quick actions were required.

The policy responses of 2020 benefited from the lessons learned from the GFC and the resilience established by regulatory measures taken in its wake, including the creation of the ESRB and ESAs. But it is not straightforward to obtain quick decisions from a body that has 35 voting members with very different constituencies and normally meets only quarterly. The battle during the past year has been to move quickly and comprehensively to avoid a systemic financial crisis and underpin those parts of the financial system at greatest risk, while supporting financial policies aimed at the recovery of the real economy.

The European Central Bank (ECB) has monetary firepower that it can deploy with speed, but it must take care not to go beyond the borders of monetary policy. They are defined by its statutes, to some extent also by precedent and even judicial rulings. Limits to the ESRB mandate are less well defined, while its authority is more circumscribed. Importantly, its geographical reach includes eight countries not in the Economic and Monetary Union. Several are financially integrated with the euro zone in ways different from the financial integration within the euro zone.

Monetary and macroprudential policies should be complementary. If necessary monetary easing raises financial stability risks, macroprudential measures can reduce them. If monetary measures are intended to counteract negative shocks to the real economy, macroprudential policy can also be supportive. But this complementarity requires careful oversight, which is an advantage to having the President of the ECB as Chair of ESRB and the central bank governors as members of its General Board. This policy coordination is rather different from the equally desirable but politically more difficult coordination between monetary and fiscal policies.

There is another key aspect of coordination that is often neglected but proved to be important in responding to the 2020 crisis: dealing with cross-border spillovers of macroprudential policies.[1] These may arise within the euro zone, among euro zone and non-euro zone members of the EU, and between the EU 27 and the rest of the world, in particular the United States. National measures may affect multinational banks; microprudential supervisory interventions are unlikely to take a cross-border, systemic macroprudential perspective; EU-wide measures may affect the competitive position of EU institutions vis-à-vis those outside the bloc; market instability is often transmitted across borders; illiquidity in one country's markets may draw liquidity from the rest of the world. All these ideally require policy coordination. The ESRB is well suited to foster this coordination within the EU and at least to represent EU positions in the international context, if not to negotiate or take measures to protect EU interests directly.

Some of these issues arose immediately when the crisis broke. As the number of Covid-19 cases outside China rose during February 2020, markets were at first unaffected. But by the last week of February, "risk-off" attitudes were spreading and volatilities were rising, in Europe as well as in the United States. Increasing demand for safe assets pushed key government bond yields down, while high-yield corporate bond spreads

rocketed upwards. Outflows from credit funds rose. Oil prices plummeted. The almost simultaneous statements from the heads of the four major central banks (President Lagarde on 2 March[2]) did not subdue the growing market turmoil.

Market conditions continued to deteriorate. The banks' countercyclical capital buffers were released, by individual regulators in an uncoordinated way, starting 8 March. On 12 March, the ECB announced a set of monetary policy and other measures. Still, there was no consensus on a financial stability emergency. But the markets knew. On 16 March, the markets crashed, and volatilities spiked – VIX, the "fear index", rose to a peak not seen since September 2008.

The ECB Governing Council met on 17 March, at the height of the "dash for cash" or "March madness". It launched the EUR 750 billion Pandemic Emergency Purchase Programme (including all assets then eligible under the existing asset purchase programme, but with greater flexibility). It expanded the eligible assets under the corporate sector purchase programme to include non-financial commercial paper. And it stated that "the ECB will ensure that all sectors of the economy can benefit from supportive financing conditions that enable them to absorb this shock."[3]

But the ESRB had already sprung into action. The secretariat had understood very early on that the pandemic emergency had led to a financial stability emergency. Following a pre-SC meeting on 10 March, the secretariat on 12 March set the stage for the SC, by laying out macroprudential measures that could be taken in response to the crisis. The ASC had wide-ranging meetings on 11 and 13 March to discuss systemic weaknesses and possible policy responses. The SC, in its meeting on 17 March, decided to go into "crisis mode". The secretariat was charged with launching a consultation to determine a list of "priority topics". After internal discussions, including the Chair of the ASC, a list of ten topics was put to General Board members, who were asked to choose five by a written procedure (not a meeting, at that stage). The SC met again on 25 March to discuss policy responses to the crisis and priorities for ESRB work. Markets had by then stabilised, but there was concern that national authorities had acted in an uncoordinated manner, over a wide range.

It has to be said that the process could have been even quicker. Some time was lost because there was not an early consensus around the ESRB secretariat view. This may have been partly an initial resistance to centralised action on the part of national authorities and various agencies. The ESRB does not have a natural constituency. Not all General Board members, and fewer officials at national and EU levels, are devoted to the principle that systemic stability requires system-level actions and coordination across various authorities, each with its own responsibilities and "turf". Nevertheless, once a consensus was reached, action and results came quickly.

After the exceptional set of meetings and extensive decentralised consultations in March, the ESRB General Board met on 2 April. It agreed on five topics for accelerated further work intended to result in specific policy proposals or ESRB analyses of key issues. The workstreams were to assemble small groups of experts put forward by the ATC as well as members of the ASC. For each workstream, the General Board would identify immediately a mission with a short timeline for delivery. Deliverables would be presented to the SC under the supervision of the ESRB First-Vice Chair, in close cooperation with the Chairs of the ATC and the ASC. The SC would discuss the deliverables and submit them, if agreeable, to the General Board for discussion and decisions. The ESRB Secretariat would support this process.

The timing was tight. In the event, the workstreams reported to General Board meetings on 6 May, 27 May, and 25 June. Some measures and publications were approved at each of these meetings. The timetable reflected not only the range and difficulty of the work, but also the need to arrive at public statements and recommendations that would command a consensus in the General Board. The complexity of some of the issues and the sometimes conflicting interests of Member States often required extended discussions and indeed negotiations to arrive at wordings that were generally acceptable. Leadership from the top was essential and was forthcoming.

The selected priority areas and corresponding workstreams were as follows:

- implications for the financial system of guarantee schemes and other fiscal measures to protect the real economy;
- market illiquidity and implications for asset managers and insurers;
- impact of procyclical downgrades of bonds on markets and entities across the financial system;
- system-wide restraints on dividend payments, share buybacks and other payouts;
- liquidity risks arising from margin calls.

1 See ESRB (2020a).
2 See ECB (2020a).
3 See ECB (2020b).

The initial mandates of these workstreams were detailed, and they were generally followed closely. The work was intensive, with innumerable teleconferences. The resulting output was remarkable, due to sustained effort by staff and workstream members and careful, sustained guidance from the top. I now paraphrase the individual mandates as stated at the outset and set out the work produced by the five groups, with some commentary. Note that workstreams 3 and 4 were chaired by members of the ASC, while the other three workstreams were chaired by national central bank officials.

1 Implications of guarantee schemes and other support fiscal measures on the financial system

Unprecedented national fiscal measures are intended to mitigate the financial impact of the fight against Covid-19 on the real economy, and indirectly also on the financial sector. These include postponements of payments to banks (public moratoria), state guarantees to incentivise lending, and public subsidies (state aid). Understanding their impact and effectiveness is essential to foresee future strains on the financial sector and the risk that the financial sector will deepen the crisis through pro-cyclical behaviour: e.g., a steep increase in credit loss provisions and non-performing exposures; or failures of major financial institutions.

The tasks of this workstream were to examine financial stability risks in light of these fiscal measures and to propose measures that might mitigate these risks. It was to analyse:

- implications of the various national guarantee schemes for lending at both the national and European level. This included the cross-sectoral and cross-country implications – intended and unintended – of national guarantee schemes;
- the capacity of the schemes to ensure that a credit crunch is avoided;
- the impact on solvency and viability of banks/insurers/other financial institutions, in particular those with high non-performing loan (NPL) ratios prior to the Covid-19 crisis, also looking at cross-sectoral spillovers;
- the impact of the prudential and accounting treatment of defaults on capital ratios;
- the impact on banks' and insurers' sovereign exposures from the increase in public indebtedness and hence debt sustainability;
- the impact of state guarantees on risk weights and capital ratios;
- possible cooperation and coordination among authorities during the crisis regarding the recovery or resolution of unviable institutions.

Deliverables included:

- an assessment of the diversity of national support schemes and the implications thereof for (i) the resilience of national financial sectors and their ability to provide credit and (ii) for the functioning of the Single Market (e.g. if lending is channeled to markets with the strongest public support for borrowers or differences in the level of fiscal support distort competition among financial services providers);
- identification of areas where EU-wide coordination by the ESRB would enhance the ESRB member authorities' ability to cope with cross-border and cross-sectoral issues;
- possible communications to be issued either by the ESRB or in coordination with the ESRB member institutions; possible informal statements to be transmitted to stakeholders; and possible ESRB warnings and recommendations.

Note here the emphasis on EU-wide coordination and on the defense of the Single Market. Both themes recur in other areas: for example, the work on system-wide restrictions on bank and insurance corporation payouts.

The resulting output of this group included a Recommendation of the ESRB on monitoring the financial stability implications of debt moratoria, and public guarantee schemes and other measures of a fiscal nature taken to protect the real economy in response to the Covid-19 pandemic (ESRB/2020/8).[4] This monitoring was effected by means of several detailed templates produced by the group. The ESRB also issued a letter to governments on the financial stability impact of the national guarantee schemes and other fiscal measures.[5]

2 Market illiquidity and implications for asset managers and insurers

The sharp drop in asset prices associated with the pandemic and measures to fight it caused large-scale redemptions in the funds and insurance sectors, while financial markets

were becoming less liquid. The growing mismatch between redemption possibilities for investors and liquidity of assets increases the risk of further asset price falls, as asset managers and insurers may be forced to engage in (fire) sales. This could lead to contagion through losses on the same or correlated assets, which would cause financial instability. Fund managers typically have a range of tools to deal with a wave of redemptions, including swing pricing and redemption gates, although their availability differs across EU jurisdictions. In the insurance sector such tools are typically not available. The tasks of this workstream was to examine financial stability risks stemming from mismatches between asset liquidity and redemptions and to propose measures that could mitigate these risks. It was to analyse:

- trends in the liquidity of different types of assets held by funds and insurers;
- redemption trends in the funds and insurance sectors as well as possible spillovers from the investment fund sector to the insurance or pension fund sector;
- implications for market liquidity;
- ways in which risks to financial stability could be mitigated. This could include assessing costs and benefits of national authorities suspending redemptions in investment funds and insurance products in the public interest as well as measures beyond the remit of (macro)prudential authorities, such as central banks acting as "market-maker of last resort";
- possible alternative tools in the insurance sector, in the absence of macroprudential tools to address liquidity risks;
- possible proposals for regulatory reform that could be implemented urgently.

Deliverables included:

- assessment of the possible future evolution of liquidity of main financial assets held by funds and insurers and their likely resilience to redemption requests;
- identification of areas where EU-wide coordination by the ESRB would enhance the ESRB member authorities' ability to cope with cross-border and cross-sectoral issues;
- possible communications to be issued either by the ESRB or in coordination with the ESRB member institutions;
- possible informal statements to be transmitted to stakeholders; possible ESRB warnings and recommendations.

Here again, the stress on EU-wide coordination is notable. This indeed recurs in the mandate for all five workstreams. The ESRB was very conscious of its unique role in promoting such coordination in the macroprudential space.

The work of this group resulted in an ESRB Recommendation on liquidity risks in investment funds (ESRB/2020/4), with a public statement on the use of liquidity management tools, and a letter to EIOPA on liquidity risks in the insurance sector.[6] Both EIOPA and ESMA responded with public statements. Workstreams 2 and 3 jointly produced an "issues note" analyzing liquidity in the corporate bond and commercial paper markets and the procyclical impact of downgrades, with implications for asset managers and insurers.[7]

3 Procyclical impact of bond downgrades on markets and financial institutions

The economic shock of the fight against the pandemic could be amplified by large-scale downgrades of bonds (including securitised debt instruments). As the implications of the economic shutdown become apparent, many BBB-rated entities could lose their investment grade status. This would render them ineligible for many portfolios, including those that track investment grade indices and some exchange-traded funds (ETFs). It would also render them ineligible for the ECB's Corporate Sector Purchase Programme (CSPP). This would have implications for the refinancing costs for firms and the use of credit lines of banks and could increase the scale of insolvencies and job losses. Downgrades could affect financial institutions with large exposures to such assets, possibly resulting in systemically relevant failures or reduced lending capacity.

This workstream examined the implications for the financial system from a systemic point of view, notably analysing:

- new issuance of investment grade bonds;
- the volume of investment grade bonds that might be subject to downgrades, which entities hold them, and the impact and degree of implied portfolio rebalancing;

4 See ESRB (2020b).
5 See ESRB (2020c).
6 See ESRB (2020d).
7 See ESRB (2020e).

- expectations of rating agency actions;
- the borrowing needs of marginal investment grade or downgraded issuers who may struggle to refinance themselves in the bond market and would need to turn to banks;
- the likely scale of insolvencies of highly leveraged companies and of resulting losses to lenders;
- functioning of the market for high-yield (speculative) bonds, its capacity to absorb "fallen angels" without disruption;
- measures to mitigate risks to financial stability, e.g. ways to counteract mechanical adverse widespread effects of rating downgrades, noting measures beyond the remit of (macro)prudential authorities such as flexibility in the collateral eligibility for standard central bank operations or special purchase programmes.

Deliverables included:

- assessment of the possible future evolution of downgrades and their direct and indirect implications for the financial sector;
- identification of areas where EU-wide coordination by the ESRB would enhance member authorities' ability to cope with cross-border and cross-sectoral issues;
- possible communications to be issued either by the ESRB or in coordination with ESRB member institutions; possible informal statements to be transmitted to stakeholders; possible ESRB warnings and recommendations.

In addition to the issues note described above (joint with Workstream 2), this group (with substantial help from the ECB staff) executed a system-wide scenario analysis of large-scale corporate bond downgrades.[8] This was the first such top-down, aggregate assessment of the possible effects of a wave of downgrades and involved considerable methodological innovation as well as assembly of data from a range of different databases. Moreover, following extended discussions, the General Board agreed to send a letter to the European Commission and ESMA on the potential impact of large-scale downgrades by credit rating agencies, proposing that the Commission could, in cooperation with ESMA, revisit the role of contractual references to ratings in investment mandates and prospectus of funds and assess the transparency of rating agency methodologies.[9]

4 System-wide restraints on dividend payments, share buybacks and other payouts

Several ESRB member institutions (EBA, EIOPA, ECB/SSM[10]) had already encouraged banks and insurance corporations in the European Union to restrain voluntary payouts (e.g. dividends, bonuses, share buybacks aimed at remunerating shareholders). Such measures can enhance the resilience of the financial sector, strengthening its capacity to lend to the real economy and reducing the risk of failures of financial institutions and needs for public intervention. The ESRB was to consider further supporting these welcome developments by:

- promoting uniform adoption by all National Supervisory Authorities (NSAs) of measures recommended by ESAs;
- making the case for global or regional arrangements beyond the EU going in the same direction;
- considering pros and cons of the extension of the same recommendation to other financial corporations and possibly to non-financial corporations;
- investigating the impact of the recommendations on the functioning of the Single Market, including issues of the payment of dividends of subsidiaries to the groups;
- linking future (i.e., beyond 2020) limitations on payouts to possible recapitalisation; need for legislative action vs. voluntary requests.

Deliverables included:

- assessment of pay-out trends in the financial and non-financial corporate sector and their implications for the resilience of the financial sector and its ability to provide credit to the real economy;
- identification of areas where EU-wide coordination by the ESRB would enhance the ESRB member authorities' ability to cope with cross-border and cross-sectoral issues;
- possible communications to be issued either by the ESRB or in coordination with the ESRB member institutions; possible informal statements to be transmitted to stakeholders; possible ESRB warnings and recommendations.

This workstream did indeed deliver a Recommendation, addressed by the General Board to the competent authorities, on the restriction of distributions during the Covid-19 crisis, applicable until the end of 2020.[11] It also wrote an explanatory

report published by ESRB.[12] The work here was exceptionally difficult because of perceived conflicts of the interests of different Member States, in particular home and host countries of major cross-border banks, and the need to defend the Single Market. The ESAs, too, had their own views (some having already taken relevant measures), and microprudential perspectives sometimes differed from macroprudential, system-wide views. The resulting Recommendation is a tribute to the virtues of compromise and recognition of system-wide interests.

5 Liquidity risks arising from margin calls

The crisis resulted in significant margin calls on derivative positions, with major implications for the liquidity of counterparties and their funding needs, and possibly their solvency. One objective of the post-GFC reforms was to reduce the buildup of uncollateralised exposures from derivative transactions through the introduction of mandatory clearing for OTC derivatives and daily margining in cleared (and uncleared) transactions. As a result, more and more products are cleared by central counterparties (CCPs), which have greatly contributed to reducing overall counterparty credit risk as well as overall liquidity needs in liaison with netting benefits. In times of financial strain, however, initial margin calls tend to rise as CCPs need to protect against the risk of counterparty default and the likely increase of the cost of managing such a default. Variation margins rise as they reflect market moves. Initial and additional margin requirements might become more stringent, along with the possible worsening of credit quality of members and their clients. These tensions may be exacerbated for clearing members who have multi-currency activities in various CCPs, whether in Europe or offshore, and who therefore face multiple sources of increased liquidity risk. There might also be repercussions for funding markets and a balance sheet impact from asset encumbrance in terms of liquidity and solvency requirements.

This workstream analysed:

- the amount and concentration of initial and variation margin on counterparties in cleared and non-cleared transactions, including the knock-on effects on clients clearing via clearing members and to what extent membership requirements and access policies might create additional risks;
- how margins are funded and the implications of encumbering assets held in initial margin;
- whether the clearing system and antiprocyclicality measures functioned as intended or whether CCPs or clearing members acted in ways that amplified liquidity risk;
- whether recent events revealed fault lines that had not been addressed by the post-GFC reforms;
- ways to mitigate risks to financial stability that could emerge from large margin calls.

Deliverables included

- assessment of the scale of current and possible future margin calls and their impact on market participants and on the real economy;
- identification of areas where EU-wide coordination by the ESRB would enhance the ESRB member authorities' ability to cope with cross-border and cross-sectoral issues;
- possible communications to be issued either by the ESRB or in coordination with the ESRB member institutions; possible informal statements to be transmitted to stakeholders;
- possible ESRB warnings and recommendations.

The main output of this workstream was also an ESRB Recommendation, in this case on liquidity risks arising from margin calls (ESRB/2020/6)[13], and it was supplemented by another report published by ESRB.[14] The Recommendation had four separate components, and the work reflects a high level of technical expertise in the working group.

Conclusion

It should be evident that the ESRB – its leadership, the General Board, its secretariat and committees – addressed the systemic risks created by the covid-19 crisis with exceptional effort and wide-ranging results. I believe they have notably enhanced the stability of the financial system and will continue to do so. The examples here of policy coordination across diverse constituencies are inspiring. One may hope that this is not just a short-run response to crisis, and that this coordination – essential for systemic stability – will continue in normal times.

8 See ESRB (2020f).
9 See ESRB (2020g).
10 Single Supervisory Mechanism.
11 See ESRB (2020h).
12 See ESRB (2020i).
13 See ESRB (2020j).
14 See ESRB (2020k).

REFERENCES

European Central Bank – ECB (2020a)
"Statement by the President of the ECB", press release, 2 March:
https://www.ecb.europa.eu/

ECB (2020b)
"ECB announces €750 billion Pandemic Emergency Purchase Programme (PEPP)", press release, 18 March:
https://www.ecb.europa.eu/

European Systemic Risk Board – ESRB (2020a)
The global dimensions of macroprudential policy, reports of the ESRB Advisory Scientific Committee, No. 10, February:
https://www.esrb.europa.eu/

ESRB (2020b)
"Recommendation of the European Systemic Risk Board of 27 May 2020 on monitoring the financial stability implications of debt moratoria, and public guarantee schemes and other measures of a fiscal nature taken to protect the real economy in response to the COVID-19 pandemic", May:
https://www.esrb.europa.eu/

ESRB (2020c)
"ESRB work on implication for the financial system of guarantee schemes and other fiscal measures to protect the real economy in response to the coronavirus", letter, May:
https://www.esrb.europa.eu/

ESRB (2020d)
"Recommendation of the European Systemic Risk Board of 6 May 2020 on liquidity risks in investment funds", May:
https://www.esrb.europa.eu/

ESRB (2020e)
Issues note on liquidity in the corporate bond and commercial paper markets, the procyclical impact of downgrades and implications for asset managers and insurers, May:
https://www.esrb.europa.eu/

ESRB (2020f)
A system-wide scenario analysis of large-scale corporate bond downgrades, July:
https://www.esrb.europa.eu/

ESRB (2020g)
"Procyclical impact of downgrades of corporate bonds on markets and entities across the financial system", letter, October:
https://www.esrb.europa.eu/

ESRB (2020h)
"Recommendation of the European Systemic Risk Board of 27 May 2020 on restriction of distributions during the COVID-19 pandemic", May:
https://www.esrb.europa.eu/

ESRB (2020i)
System-wide restraints on dividend payments, share buybacks and other pay-outs, June:
https://www.esrb.europa.eu/

ESRB (2020j)
"Recommendation of the European Systemic Risk Board of 25 May 2020 on liquidity risks arising from margin calls", May:
https://www.esrb.europa.eu/

ESRB (2020k)
Liquidity risks arising from margin calls, June:
https://www.esrb.europa.eu/

THE ROLE OF MACROPRUDENTIAL POLICY IN THE INSURANCE SECTOR: EXPERIENCE DURING THE COVID-19 CRISIS

Jonathan DIXON

Secretary General
International Association
of Insurance Supervisors (IAIS)

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

The International Association of Insurance Supervisors (IAIS) has evolved its approach to assessing and mitigating systemic risk in the global insurance sector. This new approach is termed a "Holistic Framework", recognising that systemic risk may not only arise from the distress or disorderly failure of individual insurers but also from the collective exposures of insurers at a sector-wide level.

This article sets out this new approach, which consists of three reinforcing pillars: (i) macroprudential monitoring at a global level; (ii) the application of more stringent supervisory requirements to a broader portion of the insurance sector; and (iii) assessing the consistent implementation of those standards.

During the Covid-19 pandemic, the Holistic Framework has already proven its value as it has allowed the IAIS to monitor the impact of Covid-19 on the global insurance sector through targeted data collections and has provided the necessary toolkit for insurance supervisors to take a coordinated approach to systemic events.

The mission of the International Association of Insurance Supervisors (IAIS) is to promote effective and globally consistent supervision of the insurance industry in order to develop and maintain fair, safe and stable insurance markets for the benefit and protection of policyholders and to contribute to global financial stability. The IAIS activities supporting this mission can be described as follows *(see Diagram 1)*.

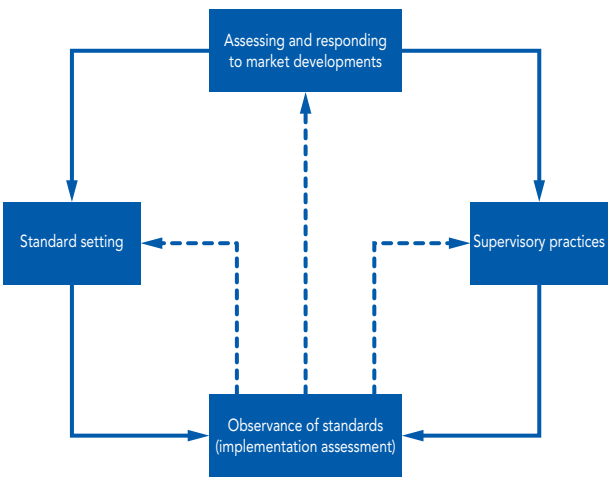
- Assessing and responding to market developments:
  Monitoring global market trends and developments, including macroprudential monitoring (i.e. the global monitoring exercise – GME – of potential systemic risk in the insurance sector).

- Standard setting:
  Setting and maintaining globally recognised standards for insurance supervision that are effective and proportionate.

- Supervisory practices:
  Supporting supervisors to put supervisory material into practice, e.g. by developing supervisory guidance papers and peer exchange platforms.

- Observance of standards:
  Assessing implementation of IAIS supervisory material as well as facilitating supervisory capacity building.

Diagram 1 IAIS activities



Source: International Association of Insurance Supervisors (IAIS).

1 Holistic Framework

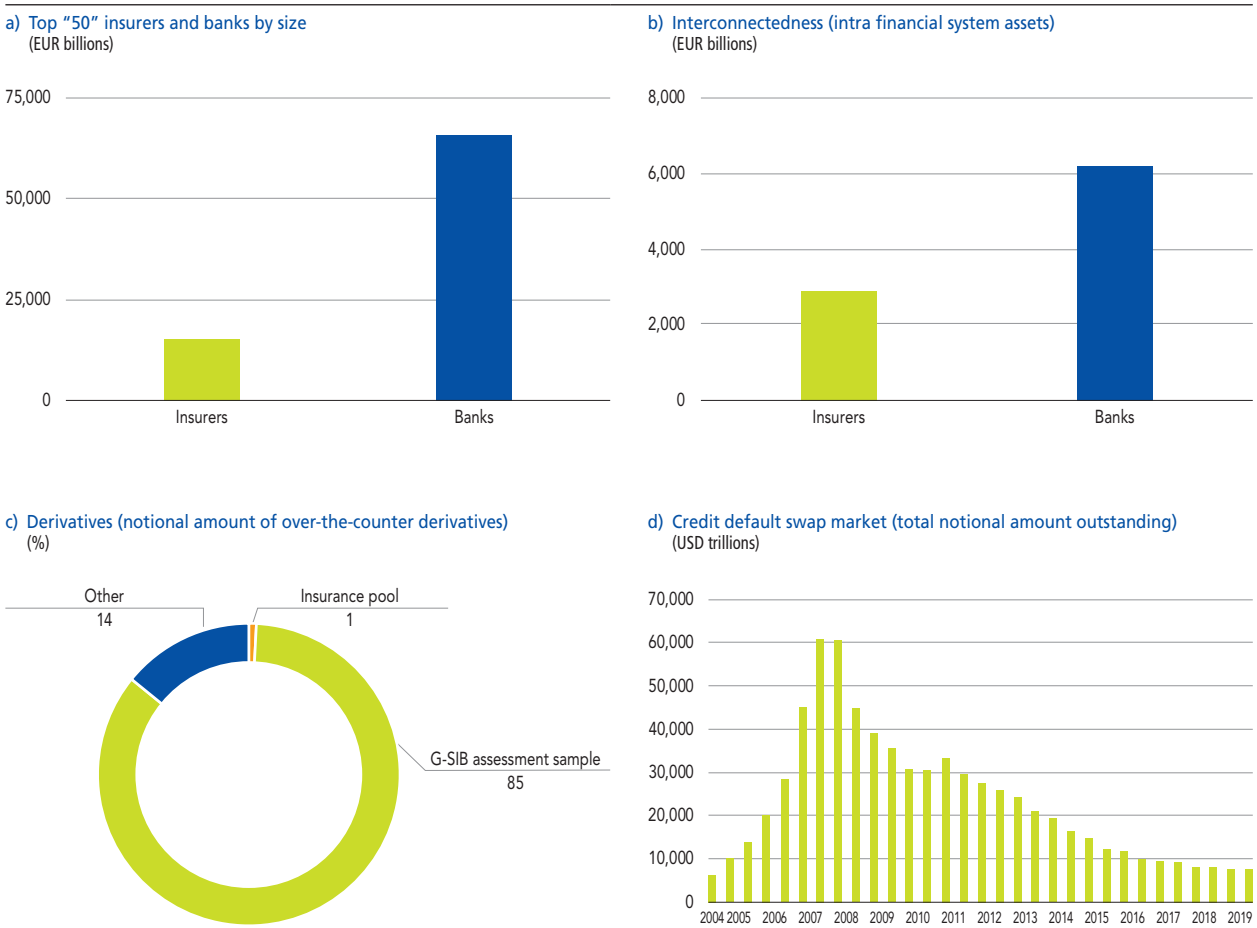
Consistent with this reinforcing cycle of IAIS activities, the Holistic Framework for the assessment and mitigation of systemic risk in the global insurance sector ("Holistic Framework")[1], adopted in November 2019, consists of the following key pillars:

- macroprudential monitoring at a global level (the GME);[2]
- supervisory and supporting material, including more stringent requirements to a broader portion of the insurance sector;[3] and
- assessing consistent implementation of IAIS standards.

In doing so, the IAIS takes a holistic approach at various levels. Firstly, it recognises that systemic risk in the insurance sector may arise not only from the distress or disorderly failure of an individual insurer but also from the collective exposures and activities of insurers at a sector-wide level. Secondly, since insurers form an integral component of the financial system, the Holistic Framework contributes to a cross-sectoral view when assessing systemic risk. In the development phase of the framework, the IAIS and the Financial Stability Board (FSB) collaborated closely and the framework also benefited from cross-sectoral work undertaken in conjunction with the Basel Committee on Banking Supervision (BCBS). Thirdly, the Holistic Framework takes into account the time-varying nature of systemic risk, e.g. the state of the overall economy or the stability of certain financial markets.

Chart 1 provides four illustrations of the relevance of taking a holistic perspective. While insurers play a crucial role within the global financial system, the scale and interconnectedness of insurers compared to banks is quite limited, as illustrated by the total balance sheet size and total financial system assets of the top 50 insurers worldwide relative to that of the top 50 banks (by size). Hence, the issue of "too big to fail", or "too interconnected to fail", at an individual insurer level is limited compared to that of individual banks. Similarly, in the global over-the-counter (OTC) derivatives market, the share of the approximately largest 50 insurers worldwide is less than 1%. Finally, the relevance of taking a time-varying view can be illustrated by looking at the development over time of the derivatives trading market (credit default swaps – CDSs); a market that played a crucial role in the great financial crisis. At its peak in 2007, insurance group American International Group's (AIG) notional portfolio of CDS commitments amounted to USD 530 billion.[4] By end-2019 the total CDS market shrank by more than 85%. To summarise, taking a holistic view supports a systemic risk assessment that is proportionate

C1 Insurers within the broader financial system



Sources: International Association of Insurance Supervisors (2019d), Basel Committee on Banking Supervision (2019), Bank for International Settlements (2019).
Notes: All data per year end 2018, except for the data on credit default swap market which is from year end 2019.
The top 50 insurers is based on 2019 global systemically important insurer (G-SII) data collection exercise in which around 50 insurers participated ("Insurance Pool").
The top 50 banks is based on the top 50 banks (ranked by size) participating in the global systemically important banks (G-SIB) exercise.
The G-SIB Assessment Sample consists of all 75 banks participating in the G-SIB exercise.

to the actual risk, and takes into consideration that the systemic impact of the insurance sector may also depend on the functioning of other elements within the wider financial system.

This holistic approach is consistent with that of other standard setting bodies (SSBs), that have also carefully considered the appropriate balance between a focus on individual entities and a focus on sectoral or activities.[5] For the banking sector, this has resulted in a combination of additional requirements for global systemically important banks (G-SIBs) and the integration of various macroprudential tools into the sector-wide Basel III Framework, such as a leverage ratio, liquidity requirements or the countercyclical buffer. For the asset management sector, this consideration has instead resulted in a principal focus on activities, aimed at addressing structural vulnerabilities from asset management activities. Any further work by the FSB and International Organization of Securities Commissions (IOSCO), in the case of asset management, will be on any residual entity-based sources of systemic risk from distress or disorderly failure that cannot be effectively addressed by market-wide activities-based policies.[6]

1 See IAIS (2019a).
2 See IAIS (2019b).
3 See IAIS (2019c).
4 See AIG (2007).
5 See Saporta (2016).
6 See FSB (2017).

2 Global Monitoring Exercise (GME)

The first step in any macroprudential policy framework is the monitoring and assessment of risks and developments that may ultimately affect financial stability. The IAIS is undertaking this monitoring exercise at the global level. The IAIS' GME involves an annual data collection (plus additional deeper dive data collections as need be) of insurance market trends and developments to determine any potential build-up of systemic risk in the global insurance sector. The IAIS' GME serves as a complement to the macroprudential surveillance at the jurisdictional or regional level by supervisors aimed at monitoring systemic risks building up within jurisdictions *(see next section)*. This enables a feedback loop between the global monitoring by the IAIS and the macroprudential surveillance by supervisors. For instance, vulnerabilities building up in certain jurisdictions may have cross-jurisdictional implications. Correspondingly, the interpretation of global trends will benefit from having a better understanding of the underlying trends at the jurisdictional or regional level.

The GME takes a holistic approach by collecting data at both the individual insurer level and at an aggregate, jurisdictional level: it covers quantitative information from around 50 of the largest international insurers as well as from IAIS member jurisdictions that account for about 90% of the global market (in gross written premiums, 2019). This is complemented by a qualitative survey that covers supervisors' assessments of macroprudential risks, in terms of probability, impact and trends, and supervisory responses, as applicable. Potential sources of systemic risk that are analysed include counterparty exposures, macroeconomic exposure and liquidity risk.

Under the Holistic Framework, data collection is no longer focussed on identifying prospective Global Systemically Important Insurers (G-SIIs), but rather aims to support a comprehensive and forward-looking assessment of the potential build-up of systemic risk in the insurance sector. The data analysis and qualitative input from supervisors, together with engagements with key stakeholders such as Chief Risk Officers (CROs) of the global insurance groups, will be used to inform an annual collective discussion amongst IAIS members on the potential global systemic risk in the insurance sector and a coordinated supervisory response, if necessary. The discussion of appropriate supervisory responses will include the consideration of enhanced supervisory policy measures and/or powers of intervention, taking into account the IAIS' assessment of those supervisory policy measures and/or powers of intervention that have already been implemented.

The IAIS will share the outcomes of the GME each year with participants in the GME (participating insurers and IAIS members), the FSB and the general public.

Key success factors and challenges

Data gaps

The GME relies on the quality, completeness and timely submission of the requested data as well as on the use of appropriate analytical tools to assess the data. While the IAIS has been collecting and analysing data on an individual insurer level since 2013 (as part of the G-SII data collection exercise), the data collection at a sector-wide jurisdictional level is a newer development. An important component of the GME is the assessment of interplays between these two complementary data collections, recognising the challenge that while both data collections target the same risks, they take a different perspective and consolidation approach (group-level versus legal-entity level).

Responding to emerging risks

As part of the GME, and in line with its strategic plan,[7] the IAIS will also explore emerging and accelerating risks such as climate change and cyber risks. These trends deserve further investigation to assess their potential impact on insurance markets and the wider financial system and real economy, in terms of opportunities, challenges and risks. Under the GME, such further analysis can be undertaken via ad-hoc deep dive data collections and qualitative assessments.

The first deep dive is on the potential financial stability impact of climate change on the insurance sector, which will be focussed on insurers' investment exposures to climate-related risks. The analysis is supported by an ad-hoc data collection amongst IAIS members, aimed at gathering information on relevant exposures on insurers' balance sheets as well as on supervisory risk assessments. The results of the analysis are due to be published in mid-2021.

Forward-looking collective discussion

The collective discussion at the IAIS level of the results of the quantitative data collection and qualitative input from supervisors is a crucial element of the GME as it is the basis for a globally-coordinated response to the potential build-up of systemic risk. This global coordination is a complement to macroprudential supervision at the jurisdictional or regional level.

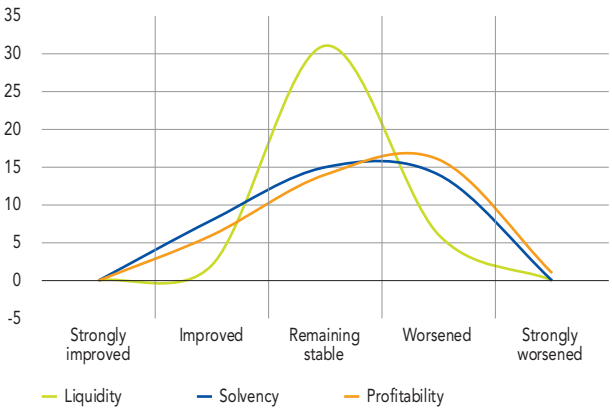
In order to ensure a forward-looking and comprehensive discussion, the IAIS has agreed on quantitative criteria to assist the annual determination of the focus of the collective discussion. These include trend and outlier

criteria to indicate the build-up of potential systemic risks. The use of quantitative criteria is complemented by expert judgement, acknowledging that relevant developments may be overlooked when only using a defined set of quantitative criteria, given the dynamic nature of systemic risk. Finally, the IAIS identified a level criterion to provide an indication of a situation in which potentially systemic activities or exposures become concentrated in an individual insurer, such that its distress or disorderly failure would pose an actual and serious threat to global financial stability.

Assessing the impact of Covid-19

Utilising the GME framework, the IAIS was able to quickly adapt and repurposed the GME to assess the impact of Covid-19 on the global insurance sector's solvency, profitability, liquidity, assets and liabilities. Both individual insurers and supervisors participated in the exercise by providing data and qualitative information on the risk assessment (*see Chart 2*) and forward-looking outlook.

C2 Qualitative supervisory assessment of the impact of Covid-19, Q2 2020
(number of respondents)



Source: International Association of Insurance Supervisors (2020a).

High-level results indicate that although the financial market volatility caused by the Covid-19 crisis in the first half of 2020 did affect the global insurance sector's solvency and profitability (primarily through its impact on assets), insurers' available capital resources generally remained well above requirements. Following a significant initial shock to the financial market, the global insurance sector has demonstrated both operational and financial resilience, aided by supervisory measures providing operational relief and by monetary and fiscal support measures in financial markets in certain regions. However, vulnerabilities remain, given the uncertainty about the duration and ongoing impact of the Covid-19 crisis. These vulnerabilities include the potential for the credit quality of insurers' fixed-income portfolios (*see Chart 3*) to decrease and the impact of the deepened low-yield environment. Overall, the vast majority of insurers' portfolios of corporate and sovereign bonds are investment grade. However, some insurers have experienced rating downgrades in their corporate bond portfolios.[8]

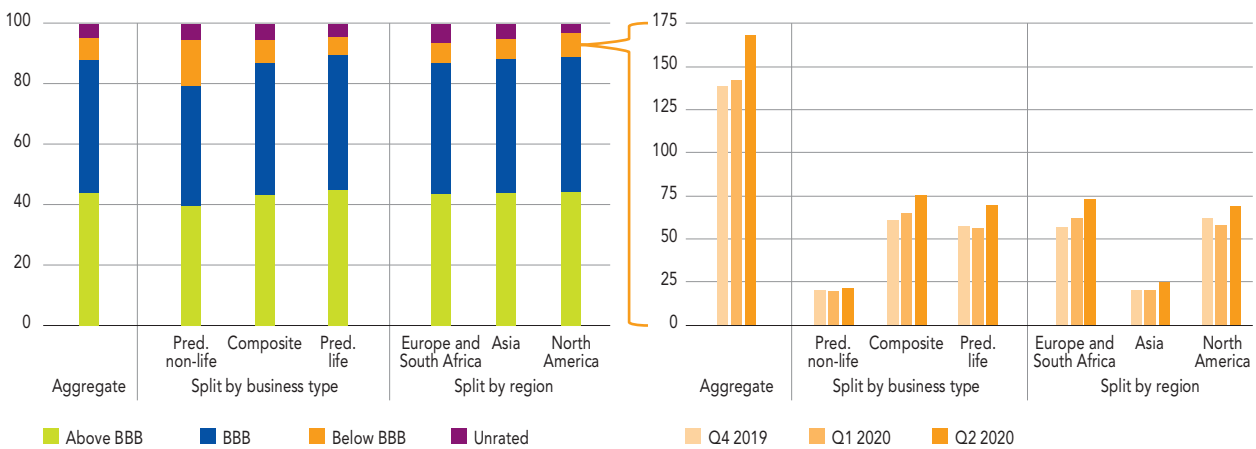
7 See IAIS (2019e).

8 See IAIS (2020a).

C3 Corporate debt holdings (composition by rating; change in non-investment grade exposure)

a) Credit quality of corporate debt holdings, Q2 2020
(%, allocation of corporate debt)

b) Corporate debt: Below BBB, Q4 2019 - Q2 2020
(USD billions)



Source: International Association of Insurance Supervisors (2020a).
Note: Pred. life = insurance groups predominantly active in life insurance business; similar for "pred. non-life".

3 Supervisory and supporting material

The IAIS supervisory material, consisting of the Insurance Core Principles (ICPs) and the Common Framework for the Supervision of Internationally Active Insurance Groups (IAIGs; "ComFrame"), aims to protect policyholders and to contribute to global financial stability through the maintenance of consistently high supervisory standards in IAIS Member jurisdictions. The ICPs apply to insurance supervision of all insurers, whereas ComFrame applies to IAIGs only.

In developing the Holistic Framework, the IAIS adopted revisions to the ICPs and ComFrame by enhancing or adding supervisory policy measures specifically designed to assess and mitigate potential systemic risk building up in the insurance sector. The policy measures are deliberately not labelled as either microprudential or macroprudential measures. By mitigating certain risk exposures, policy measures that primarily have a microprudential perspective may also help increase the resilience of the insurance sector as a whole and/or decrease the probability and magnitude of any negative systemic impact. Likewise, many measures that are primarily aimed at macroprudential analysis, such as supervisory sector-wide stress testing, are also microprudential tools.

With this, the IAIS has moved away from the previous binary approach, in which certain pre-determined policy measures applied only to a small set of identified G-SIIs. Instead, it promotes a proportionate application of supervisory material for macroprudential purposes to a broader portion of the insurance sector.

The supervisory material includes:

- ongoing supervisory requirements applied to insurers, targeted at key potential systemic exposures: liquidity risk, macroeconomic exposure and counterparty exposure;
- macroprudential supervision, aimed at identifying vulnerabilities and addressing the build-up of systemic risk at the individual insurer and sector-wide levels; and
- crisis management and planning, which includes requirements on recovery and resolution planning, as well as the establishment of crisis management groups.

In terms of powers of intervention, supervisors are required to have a sufficiently broad set of preventive and corrective measures in place to enable a prompt and appropriate response when a potential systemic risk is detected.

T1 Overview of supervisory policy measures

Thematic area	High-level description	Scope of application		G-SII policy measures
		Legal entity/group	IAIG	
Macroprudential supervision	Enhance the link of macroprudential supervision to supervisory review and reporting	●	●	
	Requirements on macroprudential supervision	●	●	
Requirements on insurers	Enterprise risk management requirements related to: • liquidity risk, • counterparty exposures, and • macroeconomic exposure.	[●]	●	[●] (liquidity management and planning only)
	Public disclosure requirement for liquidity risk	●	●	
Crisis management and planning	Coordination of crisis management preparations	●	●	
	including the establishment of crisis management groups		●	[●]
	Requirement on recovery planning	[●]	●	[●]
	Resolution framework including resolution powers	●	●	[●]
	Requirement on resolution planning		[●]	[●]
Powers of intervention	Preventive and corrective measures	[●]	[●]	[●] (systemic risk management plan)

[ ] Not applicable.
[●] Applicable/required.
[●] Applicable/required as necessary only.
[●] Comparable G-SII policy measure.
Source: International Association of Insurance Supervisors (2019a).
Note: IAIG – Internationally Active Insurance Group, G-SII – Global Systemically Important Insurer.

A full overview of the policy measures is depicted in Table 1, showing also how the Holistic Framework supervisory policy measures have a wider scope than the G-SII policy measures, both in terms of scope of application and range of the measures.

Practical application of supervisory measures during Covid-19

Many of these policy measures are being implemented in practice during the Covid-19 crisis. The IAIS has facilitated the sharing of information and discussion amongst its membership on supervisory responses to the impact of Covid-19. To this end, the IAIS developed a repository of regulatory, supervisory, financial and other policy measures being taken or planned by IAIS members in response to Covid-19. In response to identified vulnerabilities, insurance supervisors have taken a variety of measures. These include measures related to the Holistic Framework, such as:

- enhanced supervisory reporting on solvency, liquidity and profitability;
- scenario analysis and stress testing, while also requesting updates of insurers' own risk and solvency assessments (ORSA); and
- measures to limit or delay dividend payments and variable remuneration.

Supporting material

As referenced in the introduction, one of the key IAIS activities is supporting supervisors to put supervisory material into practice, for instance by developing application papers. These provide further advice, illustrations, recommendations or examples of good practice to supervisors on how supervisory material may be implemented. Related to the Holistic Framework, the following application papers are worth mentioning.

- Liquidity risk management
  This paper provides guidance and examples of considerations in applying liquidity risk management measures and on integrating this into an insurer's enterprise risk management. This notably relates to requirements around liquidity stress testing; maintenance of a portfolio of unencumbered highly-liquid assets; a contingency funding plan; and the submission of a liquidity risk management report to the supervisor. The paper was published in June 2020.[9]
- Macroprudential supervision
  The objective is to provide support to supervisors for the implementation of ICP 24 (macroprudential supervision), in designing processes and procedures for macroprudential supervision, including monitoring and analysis activities. The paper will also provide examples on the use of macroprudential surveillance tools, including supervisory stress testing. The draft Paper is planned to be published for consultation in March 2021.
- Resolution powers and planning
  The objective is to provide support to supervisors in setting up a resolution framework for insurers, including the resolution powers, resolution planning and management information systems. It also discusses good practice on (cross-border) crisis management and planning with other involved supervisors. The draft paper was published for consultation in November 2020 and is planned to be finalised by mid-2021.[10]

4 Implementation assessment

The assessment of consistent implementation of the supervisory material is the final key element of the Holistic Framework. Credible and independent assessment of implementation of the IAIS supervisory material is critically important to supporting effective and globally consistent supervision, thereby contributing to financial stability. Increasing the transparency around implementation gaps and challenges is equally important in supporting observance of the supervisory material.

In line with the IAIS Assessment Methodology for ICPs and ComFrame, the Holistic Framework implementation assessment determines whether the supervisor has and exercises, when required, the legal authority and supervisory practices to effectively perform and enforce the requirements of the relevant Holistic Framework supervisory material.

The implementation assessment of the Holistic Framework proceeds in phases, beginning with a baseline assessment in 2020 and moving to more intensive jurisdictional assessments from 2021. The baseline assessment aims to determine the extent to which supervisors have implemented the Holistic Framework supervisory material

9 See IAIS (2020b).

10 See IAIS (2020c).

and relies for a large part on jurisdictional self-assessments. The second phase will consist of more intensive targeted jurisdictional assessments, which will include in-depth verification of supervisory practices.

As part of the baseline assessment, and acknowledging that the framework was adopted just last year, IAIS Member jurisdictions were also asked to report on their implementation progress and to share their implementation plans where there are gaps. A total of 25 jurisdictions participated in the assessment, covering over 90% of the global insurance market and representing a geographically-balanced sample. A public report will be issued in March 2021.

Conclusion

The Holistic Framework, appropriately implemented, provides an enhanced basis for mitigating systemic risk in the insurance sector. In November 2019, the FSB welcomed the finalisation of the IAIS Holistic Framework.[11] In light of the finalised Holistic Framework, the FSB, in consultation with the IAIS and national authorities, decided to suspend G-SII identification as from the beginning of 2020. In November 2022, the FSB will, based on the initial years of implementation of the Holistic Framework, review the need to either discontinue or re-establish an annual identification of G-SIIs by the FSB in consultation with the IAIS and national authorities.

Reflecting upon the first year of implementation, which has unfolded very differently than anticipated, the Holistic Framework has already proven its value and versatility. The IAIS had to rapidly adjust its activities in light of the pandemic, and was able to rely on the key reforms adopted in 2019. The GME was repurposed to monitor the impact of the pandemic in a holistic manner, and the IAIS supervisory material sets out the necessary toolkit that insurance supervisors should be equipped with in order to help assess and mitigate systemic events like Covid-19.

11 See FSB (2019).

REFERENCES

American International Group – AIG (2007)
AIG 2007 Annual Report, form 10-K annual report for the fiscal year ended December 31: *http://www.aig.com/*

Bank for International Settlements – BIS (2019)
BIS statistics explorer, derivatives statistics, OTC credit default swaps, table D10.1 "by type of position": *https://stats.bis.org/*

Basel Committee on Banking Supervision – BCBS (2019)
GSIB tables from end-2013 to end-2018: *https://www.bis.org/*

Financial Stability Board – FSB (2017)
Policy recommendations to address structural vulnerabilities from asset management activities, January: *https://www.fsb.org/*

FSB (2019)
"Finalisation of IAIS holistic framework for the assessment and mitigation of systemic risk in the insurance sector", November: *https://www.fsb.org/*

International Association of Insurance Supervisors – IAIS (2019a)
Holistic Framework for systemic risk in the insurance sector, November: *https://www.iaisweb.org/*

IAIS (2019b)
Global monitoring exercise, November: *https://www.iaisweb.org/*

IAIS (2019c)
Insurance core principles and ComFrame, November: *https://www.iaisweb.org/*

IAIS (2019d)
G-SII disclosure – 2019 public report, December: *https://www.iaisweb.org/*

IAIS (2019e)
2020-2024 strategic plan, June: *https://www.iaisweb.org/*

IAIS (2020a)
Global insurance market report 2020, Covid-19 Edition: *https://www.iaisweb.org/*

IAIS (2020b)
Application paper on liquidity risk management, June: *https://www.iaisweb.org/*

IAIS (2020c)
Draft application paper on resolution powers and planning, November: *https://www.iaisweb.org/*

Saporta, Victoria (2016)
"Macroprudential Policy for Insurers – Speech", Bank of England, November: *https://www.bankofengland.co.uk/*

INTERNATIONAL CREDIT TO EMERGING MARKET ECONOMIES DURING THE COVID-19 CRISIS

Stefan AVDJIEV

Adviser for Financial Stability
Bank for International Settlements

Bat-el BERGER

Principal Data Scientist
Bank for International Settlements

Hyun Song SHIN

Economic Adviser and Head of Research
Bank for International Settlements

NB: The views expressed are those of the authors and not necessarily those of the Bank for International Settlements.

As the Covid-19 pandemic swept through the globe in the first half of 2020, international bank lending to emerging market economies (EMEs) held up surprisingly well, especially when compared to the 2015 EME stress period and the 2008 great financial crisis (GFC). The authors use the international financial statistics (IFS) of the Bank for International Settlements (BIS) to shed light on what made the Covid-19 episode different from previous stress periods. In contrast to the GFC, the banking sector was not the epicentre of the financial stress during the Covid-19 stress in March 2020. Traditional vulnerability indicators, such as the share of short-term international lending, did not send meaningful signals during the Covid-19 stress period. By contrast, the financial channel of exchange rates had a significant impact on international lending during the same period. The importance of the latter channel has increased considerably over the past decade against the backdrop of rapidly mounting US dollar debt in EMEs.

As the Covid-19 pandemic swept through the globe in the first half of 2020, international credit to emerging market economies (EMEs) held up surprisingly well. This stood in sharp contrast to the steep declines observed during the 2015 EME stress period (EME SP) and the 2008 great financial crisis (GFC). Notably, international bank lending, which was at the epicentre of the previous two stress episodes, held up remarkably well during the 2020 Covid-induced stress.

In this article, we use the BIS international banking statistics (IBS) and the BIS global liquidity indicators (GLIs) in order to shed light on what made the Covid-19 episode different from previous stress periods. We show that traditional vulnerability indicators, such as the share of short-term claims in international bank lending, did not send meaningful signals during the Covid-19 stress period. By contrast, the financial channel of exchange rates had a significant impact on international lending during the same period. We argue that the importance of the latter channel has increased considerably over the past decade largely due to the rapid build-up of US dollar debt in EMEs that has taken place after the GFC.

Our findings highlight the importance of the unprecedented policy measures employed by the Federal Reserve. Among other things, they prevented a sharp appreciation of the US dollar. This limited the adverse effect that a US dollar appreciation would have had on global financial conditions through the financial channel of exchange rates.

1 Data Sources

We base our analysis on the BIS IBS and the BIS GLIs. The BIS IBS consist of two main data sets: the locational banking statistics (LBS) and the consolidated banking statistics (CBS).[1] The locational banking statistics (LBS), as the name suggests, organise their information according to the residence of reporting banks. Compilation of the LBS is consistent with balance of payments principles. Under this broad heading, this data set offers two main perspectives: positions by residence of the reporting bank and by nationality of the reporting bank, meaning the jurisdiction of the bank's headquarters. So, for instance, the locational banking statistics by residence would shed light on the cross-border claims of banks doing business in Japan on borrowers in the rest of the world. An example of the locational banking statistics by nationality is the cross-border claims of Japanese banks (i.e. banks whose headquarters are in Japan), located anywhere in the world, on borrowers in the rest of the world. In both cases, LBS by residence and by nationality, positions are unconsolidated in the sense that the claims between offices of the same banking organisation (intrabank positions) are not netted out. By contrast, the intragroup positions in the BIS CBS are netted out. The CBS also have a breakdown in two main perspectives: claims on an immediate counterparty (IC) basis, or on a guarantor (G) basis. To illustrate the difference between the two (IC and G) statistical perspectives, consider an example in which a Korean bank extends a loan to a borrower China, and the loan is guaranteed by a Japanese bank. On an IC basis, the loan will be recorded as a claim of Korean banks on China. On a G basis, the loans will be reported as a claim of Korean banks on Japan.

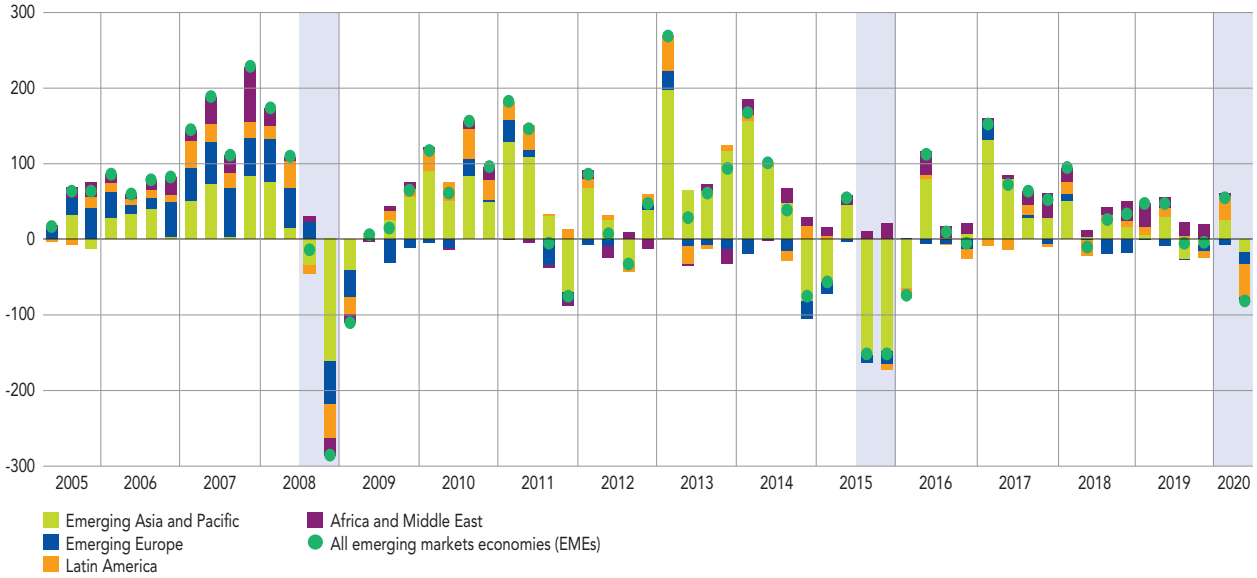
In this article, we will look mainly at cross-border claims from the LBS and international claims from the CBS. Cross-border claims are claims between residents and non-residents in the sense of the balance of payments accounts. For example, a claim booked by a bank in Japan on a counterparty residing outside Japan would be classified as a cross-border claim. International claims are the sum of cross-border claims and local claims in foreign currency. For example, the international claims of Japanese banks on counterparties in Korea include cross-border claims from Japanese banks outside Korea to borrowers in Korea, plus local lending in Korea by Japanese banks in any currency other than the Korean won.

Together, the LBS and CBS can offer complementary views on banking trends. When they are combined in a judicious manner, the two sets of statistics can be very informative. Nevertheless, there are also some caveats. Numbers from LBS and CBS cannot be compared one-to-one. This is due mainly to three wedges. Two of those wedges have already been mentioned above: (i) whereas the positions reported in the CBS are consolidated, those reported in the LBS are not, and (ii) the cross-border claims available in the LBS are defined differently from the international claims in the CBS. Finally, more countries report LBS than CBS. It is important to keep these three distinctions in mind, especially when comparing data from the same lender or on the same borrower.

We use the BIS GLIs in order to obtain information on total US dollar-denominated credit to EME residents. These series capture credit to non-bank borrowers from domestic as well as foreign sources. Total credit is defined as the sum of bank loans to non-banks and debt securities issuance by non-banks (BIS, 2015).

C1 Cross-border claims on emerging market economies (EMEs), by counterparty region

a) Quarterly adjusted changes
(USD billions)



Source: Bank for International Settlements (BIS) – locational banking statistics by residence.
Notes: Cross-border claims on emerging market economies are adjusted for breaks in series and exchange rate fluctuations. The year-on-year growth rates are calculated based on the adjusted changes for the last four quarters.
The shaded areas highlight periods of financial market distress: the great financial crisis (GFC) in 2008, the EME market unrest in 2015 and the Covid-19 pandemic in 2020.

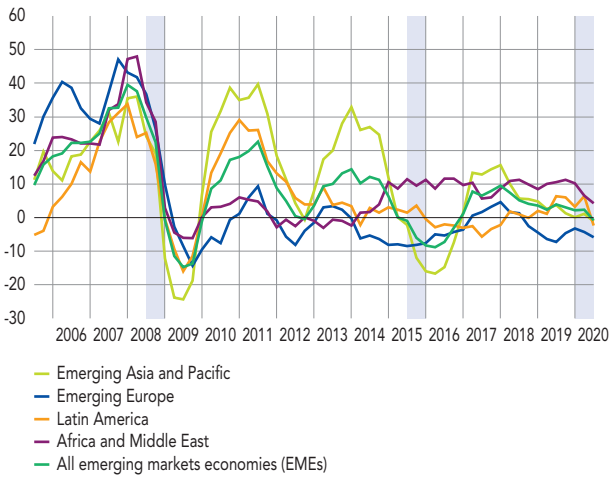
2 International credit dynamics: Covid-19 versus previous stress episodes

The BIS Locational Banking Statistics (LBS) reveal that cross-border bank lending to EMEs during the initial phase of the Covid-19 pandemic was much more stable than during the 2008 GFC and during the 2015 EME SP. Cross-border bank claims on EMEs fell by only about 30 billion USD (-1%) during the first half of 2020 (*see Chart 1a*). This compares with contractions of about 300 billion USD in the second half of 2015 (-8%) and in the last six months of 2008 (-11%). The decline in the annual growth rate of international lending to EMEs during the first half of 2020 (from +2% to -1%) was also much milder than the corresponding declines during the EME SP (from -1% to -9%) and the 2008 GFC (from +30% to -1%; *see Chart 1b*).

The overall figures for cross-border bank lending to EMEs conceal considerable heterogeneity among EME regions. Claims on Latin America and the Caribbean fell by 12 billion USD during H1 2020, while those on emerging

C1 Cross-border claims on emerging market economies, by counterparty region (continued)

b) Year-on-year growth
(%)



Source: Bank for International Settlements (BIS) – locational banking statistics by residence.
Notes: Cross-border claims on emerging market economies are adjusted for breaks in series and exchange rate fluctuations. The year-on-year growth rates are calculated based on the adjusted changes for the last four quarters.
The shaded areas highlight periods of financial market distress: the great financial crisis (GFC) in 2008, the EME market unrest in 2015 and the Covid-19 pandemic in 2020.

1 The description of the BIS LBS and the BIS CBS in this section draws heavily from Avdjiev et al. (2018).

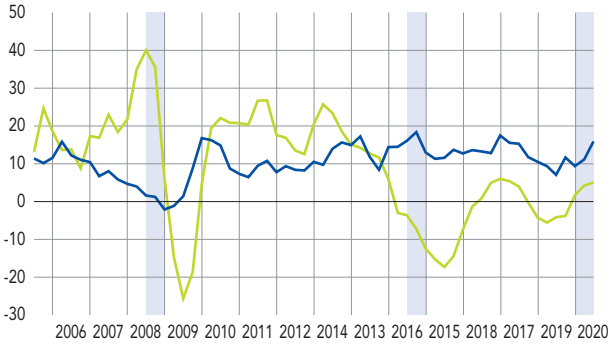
Europe declined by 23 billion USD). Meanwhile, cross-border lending to emerging Asia actually rose slightly (by 8 billion USD). By contrast, claims on the region had contracted by nearly 300 billion USD (-16%) during the 2015 EME SP and almost 200 billion USD (-21%) during the GFC. Correspondingly, the annual growth rate of lending to the region (-1% as of mid-2020) during the Covid-19 period held up much better than during the previous two crisis periods (-16% as of end-2015 and -12% as of end-2008).

The BIS GLIs reveal that total USD credit to EMEs (another key international credit metric) held up well during the first half of 2020. USD bond issuance remained much stronger than bank lending in all EME regions. This development can be viewed as an extension of the "second phase of global liquidity" – the post-GFC shift in financial intermediation from banks to capital markets, especially through the issuance of fixed income instruments (Shin,2013). Chart 2 shows the growth rate of US dollar-denominated bank loans (green lines) and bonds (blue lines) for the three EME regions in which foreign currency credit is predominantly denominated in US dollar.[2] Despite the financial turbulence caused by the pandemic, the growth rate of US dollar-denominated bonds increased sharply in all EME regions, with the exception of emerging Europe (where the euro plays a larger role than the dollar). It appears that the surge in bond issuance was mainly driven by large non-financial corporates, which took advantage of central banks' corporate bond purchase facilities in order to not only meet their liquidity shortfalls, but to also build up their cash buffers (Goel and Serena, 2020).

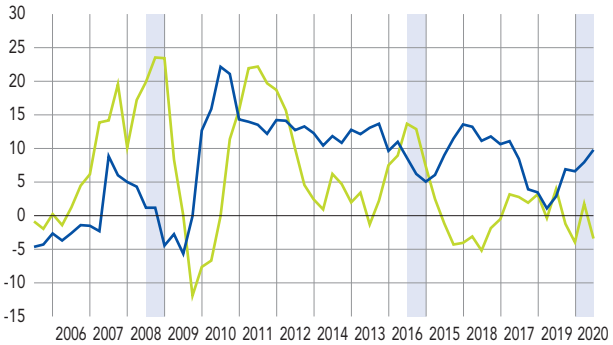
Although the loan component of US dollar credit to EMEs was not as strong as its bond counterpart, its annual growth rates also remained considerably above its 2008 GFC and 2015 EME SP levels.[3] This pattern was most pronounced in emerging Asia (*see Chart 2a*). The growth rates of bank lending to Africa and the Middle East and Latin America during the Covid-19 turmoil were a bit lower than during the 2015 EME SP (which had little impact on these two regions). Nevertheless, in both cases the 2020 growth rates were considerably higher than their 2008 GFC counterparts.

C2 Dollar credit to non-bank borrowers in selected EME regions
(%, year-on-year growth)

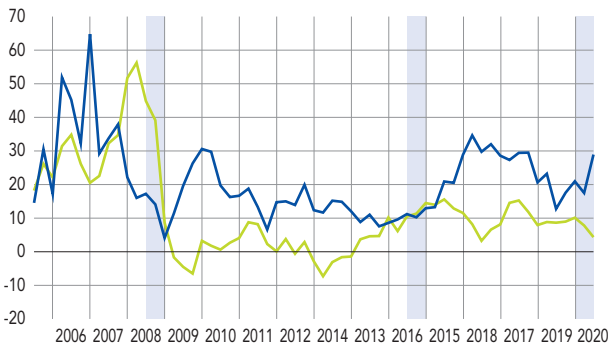
a) Emerging Asia and Pacific



b) Latin America



c) Africa and Middle East



Source: Bank for International Settlements (BIS) – global liquidity indicators.
Note: The shaded areas highlight periods of distress: the Great Financial Crisis (GFC) in 2008, the EME (emerging market economies) market unrest in 2015 and the Covid-19 pandemic in 2020.

3 Drivers of cross-border lending to EMEs during the Covid-19 period

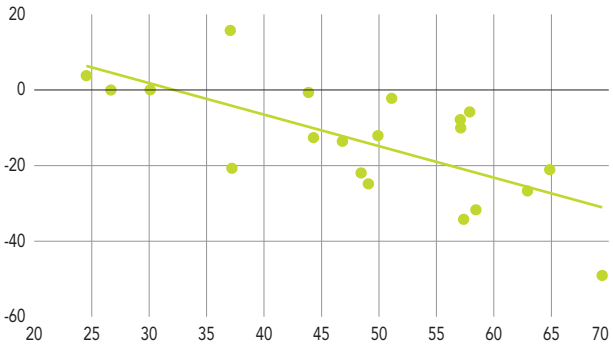
Existing research has identified several factors related to the country-level variation in cross-border bank claims on EMEs during the Covid-19 stress period (Hardy and Takats, 2020). More concretely, cross-border lending held up better for EMEs with higher levels of economic activity, lower pre-existing financial vulnerabilities and stricter lockdown measures. Moreover, lending was more stable for EMEs that tended to borrow primarily from banking systems that were better capitalised and had extended more credit commitments.

In this section, we examine a couple of additional potential determinants of cross-border lending to EMEs during the Covid-19 episode. The first one is the share of short-term international lending to a given EME, which has been linked with contractions in international credit during several previous crises episodes (Avdjiev, Berger and Shin, 2018). The second potential determinant we examine is the US dollar exchange rate, which has been shown to be a key driver of international credit flows through the financial channel of exchange rates (Bruno and Shin,2015b; Hofmann et al., 2019; and Avdjiev et al., 2019b).

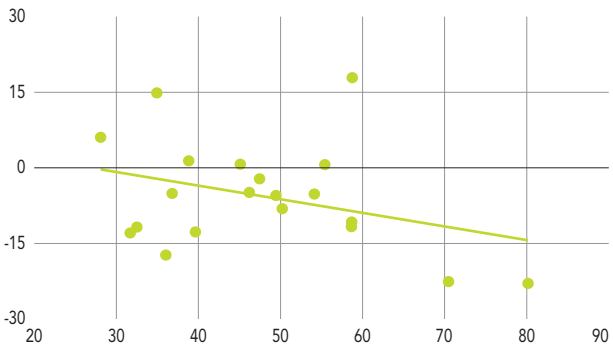
The share of short-term international lending was not nearly as important factor during the Covid-19 episode as during the previous two stress episodes (*see Chart 3*). There was a strong negative correlation between the share of short-term lending on the eve of the GFC and the contraction in international banking lending during the GFC (*see Chart 3a*). The same pattern held, albeit to a lesser extent, during the EME SP in 2015 (*see Chart 3b*). By contrast, there was no such negative relationship during the Covid-19 crisis episode (*see Chart 3c*).

C3 Short term claims share versus international lending during selected stress periods, for the top 20 borrowing EMEs

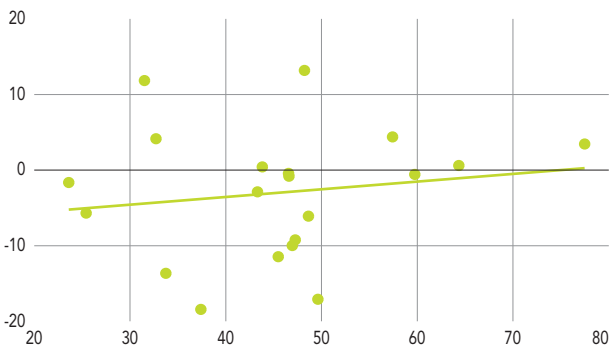
a) Great financial crisis
(%, x-axes: share of short-term credit at end-June 2008, y-axes: change in international claims in H2 2008)



b) 2015 EME stress period
(%, x-axes: share of short-term credit at end-June 2015, y-axes: change in international claims in H2 2015)



c) Covid-19 crisis
(%, x-axes: share of short-term credit at end-December 2019, y-axes: change in international claims in H1 2020)



Source: Bank for International Settlements (BIS) – consolidated banking statistics on an immediate counterparty basis (CBS/IC).
Note: The top 20 borrowing emerging market economies (EMEs) selection is based on largest EME counterparties for cross-border claims at end-June 2020: United Arab Emirates, Brazil, Chile, China, Czech Republic, Hungary, Indonesia, India, South Korea, Mexico, Malaysia, Poland, Qatar, Russia, Saudi Arabia, Thailand, Turkey, Taiwan, Vietnam and South Africa.

2 For the fourth EME region, emerging Europe, foreign currency credit is primarily denominated in euros: *https://www.bis.org/*

3 In the context of the GLIs, USD bank loans include both cross-border loans and loans extended locally.

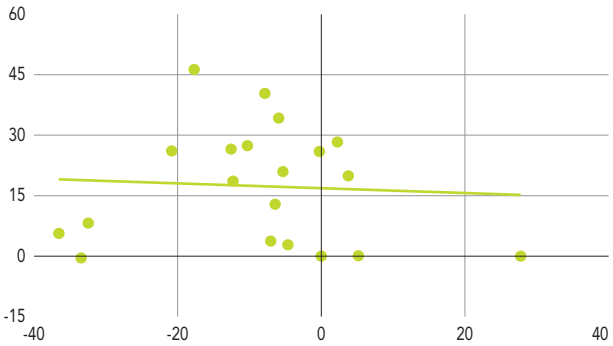
The US dollar exchange rate was a key determinant of cross-border lending to EMEs during the Covid-19 stress period (*see Chart 4*). More concretely, the more an EME's currency depreciated against the US dollar, the higher was the decline in cross-border lending to that EME during the first half of 2020 (*see Chart 4c*). Furthermore, the above negative relationship appears to have strengthened relative to the 2015 EME SP (*see Chart 4b*) and the 2008 GFC (*see Chart 4a*).

The above negative relationships are manifestations of the financial channel of exchange rates (Bruno and Shin, 2015a; Hofmann et al., 2019; and Avdjiev et al., 2019a). When there is the potential for valuation mismatches on borrowers' balance sheets arising from exchange rate fluctuations, a weaker dollar strengthens the balance sheets of dollar borrowers, whose liabilities fall relative to assets. From the standpoint of creditors, the stronger credit position of the borrowers reduces tail risk in the credit portfolio and creates spare capacity for additional credit extension even with a fixed exposure limit as given by a value-at-risk constraint or an economic capital constraint.

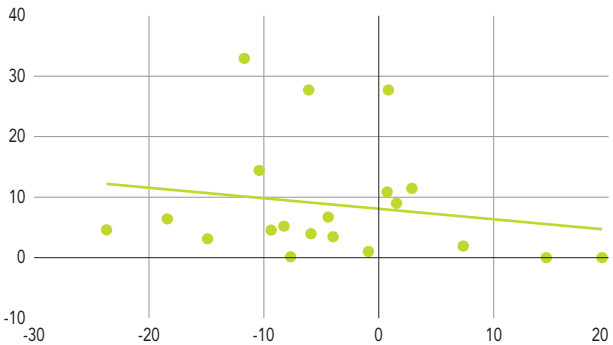
There is evidence that the financial channel of exchange rates has a significant impact not only on financial conditions, but also on macroeconomic outcomes. Hofmann and Park (2020) find that an appreciation in the broad dollar index reduces growth in EMEs and that this effect is amplified in economies with high dollar debt. Avdjiev et al. (2019b) show that a US dollar appreciation is associated not only with a reduction in cross-border bank lending flows, but also with a decline in real investment in EMEs.

C4 USD exchange rate and cross-border bank lending during selected stress periods, for the top 20 borrowing EMEs
(%, x-axes: change in cross-border claims, y-axes: change in exchange rate)

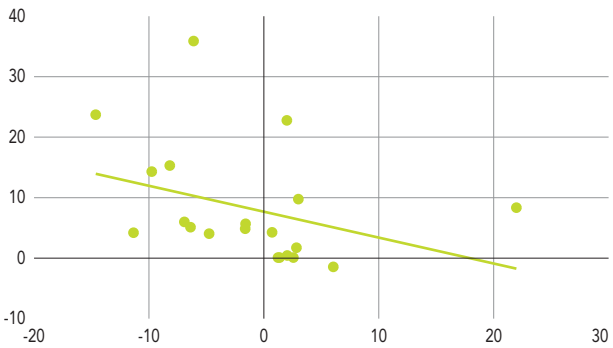
a) Great financial crisis, H2 2008



b) 2015 EME stress period, H2 2015



c) Covid-19 crisis, H1 2020



Source: Bank for International Settlements (BIS) – nominal exchange rate statistics and locational banking statistics by residence.
Note: The top 20 borrowing emerging market economies (EMEs) selection is based on largest EME counterparties for cross-border claims at end-June 2020: United Arab Emirates, Brazil, Chile, China, Czech Republic, Hungary, Indonesia, India, South Korea, Mexico, Malaysia, Poland, Qatar, Russia, Saudi Arabia, Thailand, Turkey, Taiwan, Vietnam and South Africa.

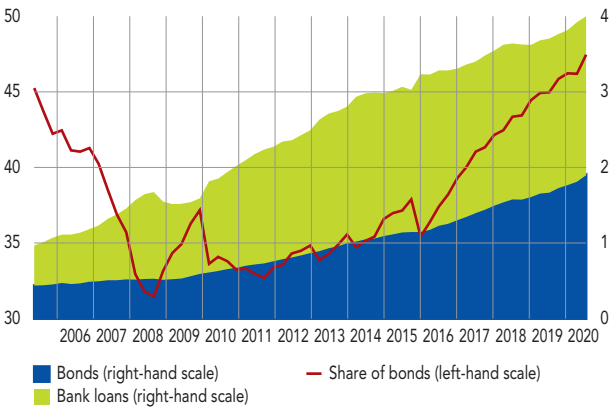
The strength of the financial channel of exchange rates has increased over time. As discussed above, the relationship between the US dollar exchange rate and cross-border lending to EMEs was much stronger during the Covid-19 crisis than during the 2015 EME SP and the 2008 GFC. This is most likely due to the fact that the amount of US dollar debt in EMEs has increased rapidly over the past decade and stood at approximately 4 trillion USD on the eve of the Covid-19 stress period (*see Chart 5*). This is likely to have exacerbated the currency mismatches on the balance sheets of EME borrowers, which has in turn strengthened the financial channel of exchange rates.

Against the above backdrop, the policy response of advanced economy central banks played a crucial role in alleviating the financial strains on EMEs. Most notably, when pressure in offshore dollar markets became extremely high in March 2020, the Federal Reserve decided to reactivate and expand its dollar liquidity swap lines with several other central banks (Federal Reserve Board, 2020). This most likely prevented a steep appreciation of the US dollar, which could have resulted in sharp contractions in international bank lending to EMEs through the financial channel of exchange rates.

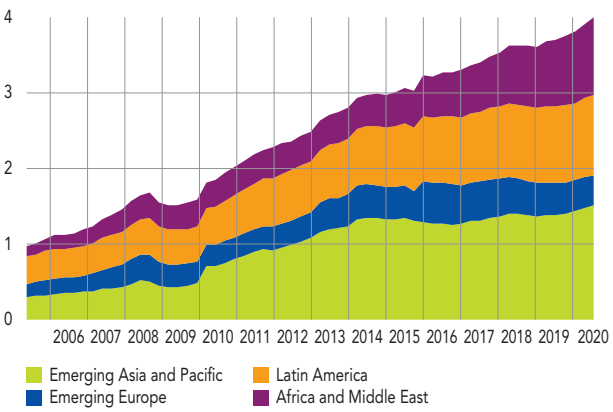
Several additional factors made the Covid-19 episodes different from previous stress periods (Aguilar and Cantú, 2020). First, the fact that EMEs were at a low point in the business cycle allowed them to loosen monetary policy. On top of that, the aggressive monetary easing in advanced economies gave EMEs even more space to cut interest rates. Last but not least, structural changes in EMEs improved inflation anchoring and limited exchange rate pass-through.

C5 US dollar-denominated credit to non-banks in emerging market economies (EMEs)

a) By instrument
(left-hand scale: %, right-hand scale: amounts outstanding in USD trillions)



b) By counterparty region
(USD trillions)



Source: Bank for International Settlements (BIS) – global liquidity indicators.

REFERENCES

Aguilar (A.) and Cantú (C.) (2020)
"Monetary policy response in emerging market economies: why was it different this time?", *BIS Bulletin*, No. 32: *https://www.bis.org/*

Avdjiev (S.), Berger (B.) and Shin (H. S.) (2018)
"Gauging procyclicality and financial vulnerability in Asia through the BIS banking and financial statistics", *BIS Working Papers*, No. 735: *https://www.bis.org/*

Avdjiev (S.), Bruno (V.), Koch (C.) and Shin (H. S.) (2019b)
"The dollar exchange rate as a global risk factor: evidence from investment", *IMF Economic Review*, Vol. 67, No. 1, pp. 151-173, February: *https://link.springer.com/*

Avdjiev (S.), Du (W.), Koch (C.) and Shin (H. S.) (2019a)
"The dollar, bank leverage and the deviation from covered interest parity", *American Economic Review: Insights*, Vol. 1, No. 2, pp. 193-208, September: *https://www.aeaweb.org/*

Bank for International Settlements – BIS (2015)
"Global liquidity indicators: background and interpretation", *Quarterly Review*, March, pp. 20-21: *https://www.bis.org/*

Board of Governors of the Federal Reserve System (2020)
Financial Stability Report, May: *https://www.federalreserve.gov/*

Bruno (V.) and Shin (H. S.) (2015a)
"Cross-border banking and global liquidity", *Review of Economic Studies*, Vol. 82, No. 2, pp. 535-64: *https://academic.oup.com/*

Bruno (V.) and Shin (H. S.) (2015b)
"Capital flows and the risk-taking channel of monetary policy", *Journal of Monetary Economics*, Vol. 71, pp. 119-132: *https://www.sciencedirect.com/*

Goel (T.) and Serena (J. M.) (2020)
"Bonds and syndicated loans during the Covid-19 crisis: decoupled again?", *BIS Bulletin*, No. 29: *https://www.bis.org/*

Hardy (B.) and Takáts (E.) (2020)
"International banking amidst Covid-19: resilience and drivers", *BIS Quarterly Review*, December, pp. 89-99: *https://www.bis.org/*

Hofmann (B.) and Park (T.) (2020)
"The broad dollar exchange rate as an EME risk factor", *BIS Quarterly Review,* December, pp. 13-26: *https://www.bis.org/*

Hofmann (B.), Shim (I.) and Shin (H. S.) (2019)
"Bond risk premia and the exchange rate", *BIS Working Papers*, No. 775: *https://www.bis.org/*

Shin (H. S.) (2013)
"The second phase of global liquidity and its impact on emerging economies", keynote address at the Federal Reserve Bank of San Francisco Asia Economic Policy Conference, November 3-5: *https://www.frbsf.org/*

MACROPRUDENTIAL POLICY IN THE WAKE OF THE COVID-19 CRISIS: INTERNATIONAL SPILLOVERS AND COORDINATION ISSUES

Claudia M. BUCH

Vice-President
Deutsche Bundesbank

Matthieu BUSSIÈRE

Director, Monetary and Financial Analysis
Banque de France

Linda GOLDBERG

Senior Vice President
Federal Reserve Bank of New York

NB: The authors would like to thank Jean Boissinot, Justine Pedrono, Dennis Reinhardt, Ursula Vogel and Benjamin Weigert for helpful comments on an earlier draft. The views expressed in this paper are solely those of the authors and should not be interpreted as reflecting those of the Banque de France, the Federal Reserve Bank of New York, the Federal Reserve System, the Deutsche Bundesbank or the Eurosystem. All errors and inconsistencies are their own.

Banks are key for the transmission of many monetary, fiscal and regulatory measures that have been taken to dampen the economic consequences of the Covid-19 crisis. This article reviews evidence on the international spillovers of macroprudential policies, focusing on the transmission through bank credit flows and how this varies depending on the characteristics of banking organisations. While authorities reacted to the common negative economic shock with fairly symmetric policy responses, asymmetric speeds of recovery across countries and sectors may imply asymmetric normalisation of policy. At that stage, long-standing questions about the international spillovers of monetary policy, fiscal policy and macroprudential measures, and the case for coordinating such measures, will take on renewed relevance. Global banks can generate positive spillovers and support the recovery in the locations they serve. Some features of global banks, such as their capitalisation and credit provision to borrowers, require particular attention during the economic recovery phase. Cross-country coordination arguments may find support if international spillovers weaken the ability of countries to recover from the Covid-19 crisis.

The global economic decline triggered by the Covid-19 sanitary crisis was met by an unprecedented policy reaction. Policymakers used all available levers to dampen the adverse economic and financial consequences of the crisis for the real economy. Banks have played a key role for the transmission of fiscal support to the real economy and of expansionary monetary policy during the initial phase of the crisis. Continued access to credit for the real economy was crucial in order to reduce corporate bankruptcies and defaults, thus helping to contain some of the long-term economic scarring from the crisis period. Banks were well positioned to maintain lending, given that they were better capitalised as a result of financial sector reforms following the global financial crisis. In addition, flexibility within the new regulatory framework has been used by temporarily relaxing regulatory constraints and thus making capital regulation less procyclical.

As the Covid-19 shock was global and fairly synchronised across regions and across sectors, policy responses were also quite similar. Depending on the initial policy space, national authorities turned to a more accommodative stance on multiple fronts, with reinforcing positive spillover effects across countries. Overall, the impact of the Covid-19 shock on the financial system and on global banking flows has been fairly contained so far.

While the economic consequences of the crisis are still far from being over, governments are looking beyond the first phase of the crisis, characterised by very strict social distancing measures and a sharp contraction in economic activity, towards the future recovery. Near-term uncertainty about macroeconomic developments, the severity of the late 2020 and early 2021 virus infections, and potential structural changes triggered by the pandemic are weighing on the outlook. However, the availability of vaccines and the experience gained over the course of 2020 in managing infections, raise the prospect of economic recovery later in 2021. The stance of different types of policy support will need to be adapted to the evolving situation of firms, households, public finances and financial institutions.

As speeds of recovery may differ substantially across countries and sectors, along with the needs of different constituencies, attention will turn to the progressive normalisation of policies. This policy normalisation is likely to be less synchronised than the initial policy response. International policy coordination may be needed in order to mitigate negative spillovers or to exploit policy synergies across countries. Understanding the nature of such policy spillovers and their impact on the economic recovery will thus be crucial.

As banking sectors remain critical for supporting the recovery, conditions in different bank sectors and the way these interact with different policies will be important focal points. Prior to the pandemic, banks had made progress in raising capital ratios *(see Chart 1)* and lowering non-performing loans *(see Chart 2)*. In response to the crisis, regulatory constraints were relaxed temporarily to facilitate bank support for economic activity. Monitored closely by international organisations, the massive loosening often utilized bank capital and liquidity tools, but also some borrower-based tools *(see Chart 3)*. For example, macroprudential capital buffers, including the countercyclical buffer, were relaxed by between 25 basis points and 300 basis points across countries *(see Chart 4)*.[1] Banks' support for economic recovery, both at home and abroad, will depend on their ability to continue lending and to rebuild capital buffers that may have been used to absorb losses, and on the ability of banking sectors to support structural change in the real economy.

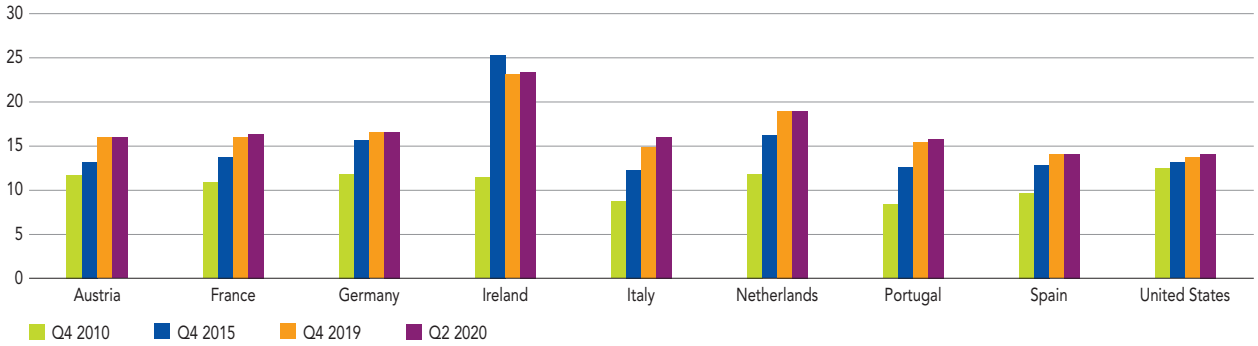
This article draws on lessons from recent research, much of it performed by central banks participating in the International Banking Research Network (IBRN),[2] into how asymmetric recoveries and policy normalisation across countries can induce shifting patterns of international lending through banks. Under certain conditions, including the level of capitalisation of banks, these international bank flows can supplement local banks' ability to fund economic recovery.

Section 1 summarises relevant empirical evidence on international spillovers of prudential policies through bank lending. Research shows that such spillovers are significant, while their magnitude depends on many factors, including the nature of the prudential measure, home and foreign macroeconomic environments, and bank-specific characteristics. Section 2 discusses issues related to policy coordination, paying particular attention to the euro area, a constituency with a common monetary policy and where responsibility for prudential policies is shared between the national and supranational – or European – levels.

1 The interested reader will find complementary information on this topic in the Bank of England blog: *https://bankunderground.co.uk/*

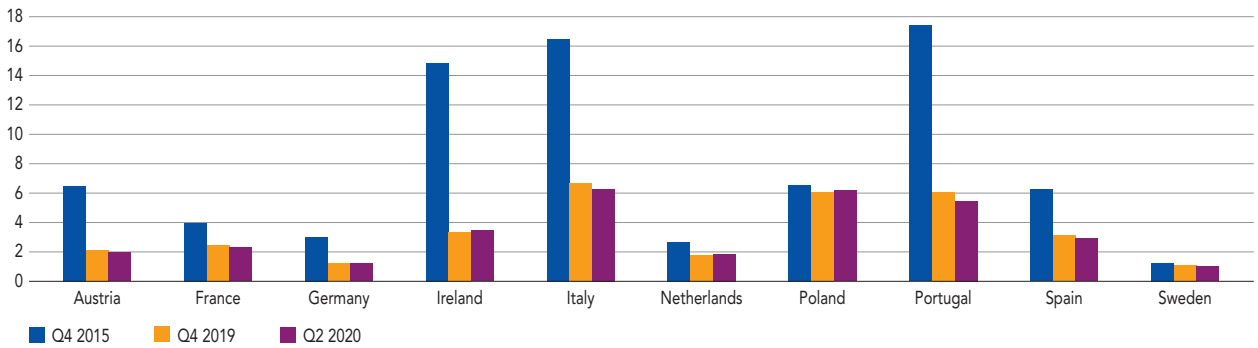
2 Information on IBRN can be found on the main website: *https://www.newyorkfed.org/ibrn*

C1 Bank capital ratio, selected economies
(regulatory Tier 1 ratio, % of risk weighted assets)



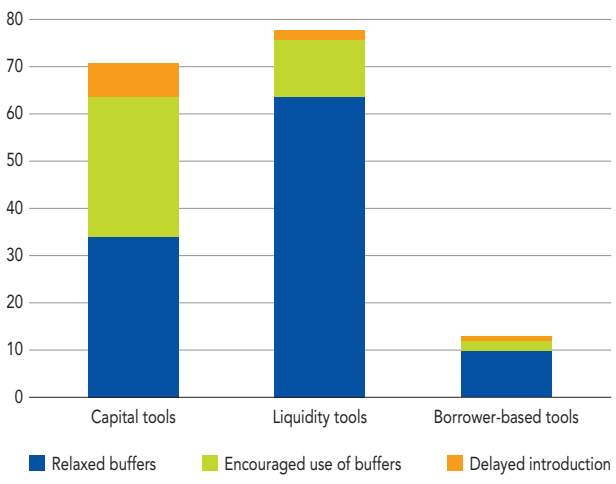
Sources: International Monetary Fund – Financial Soundness Indicators (Q4 2010, Q4 2015 and Q4 2019), European Central Bank – Statistical Data Warehouse (Q2 2020).

C2 Non-performing loan ratio, selected economies
(% of total gross loans and advances)



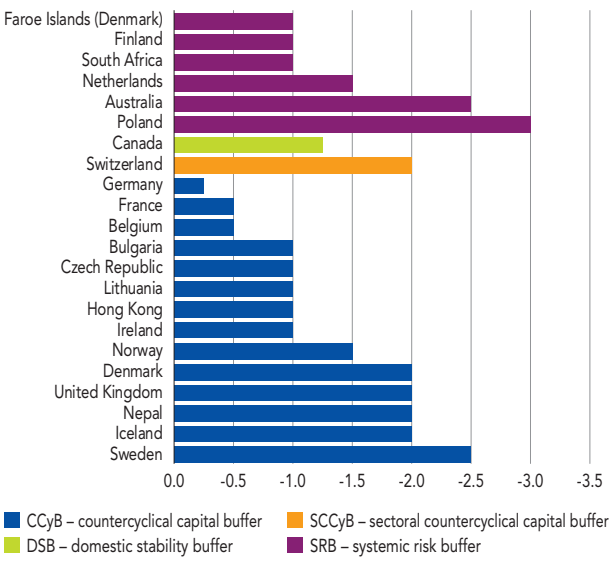
Source: European Central Bank – Statistical Data Warehouse.

C3 Relaxation of macroprudential policy tools, end-August 2020
(number of countries)



Source: Nier and Olafsson (2020).
Note: Liquidity tools include reserve requirements. For borrower-based tools: blue, green and yellow reflect a relaxation of loan-to-value (LTV), debt-service-to-income (DSTI) or debt-to income (DTI), and other tools, respectively.

C4 Relaxation of macroprudential capital buffers
(percentage points)



Source: Nier and Olafsson (2020).

1 International bank flows and macroprudential policy

The Covid-19 crisis has so far mostly affected the real economy, with very different effects across sectors. Credit markets have continued functioning, and the role of large global banks has been particularly important. Risks to financial stability have thus far been contained.

Contrary to the 2008-09 global financial crisis, there has not been a massive retrenchment of international bank flows. The crisis was inherently a financial crisis, originating in the financial sector, and affecting advanced economies relatively more than emerging markets. The financial system repairs that ensued, including through comprehensive reforms to bank capital, liquidity and risk management, have made the financial system more resilient. Resolution reforms have improved the ability of authorities to deal with banks in distress. In response to these reforms, global banks repositioned their activities, and market shares tended to increase for better-capitalised banks but also for non-bank financial intermediaries (Financial Stability Board – FSB, 2019, 2020). Generally, better-capitalised banks tend to be less flighty lenders and have more risk-absorbing capacity (Avdjiev et al., 2020). This investment in robust banks, the global nature of the crisis, alongside the massive policy response to support the real economy, including via central bank swap lines and lending through international organisations, made sudden stops in banking capital flows during the pandemic more limited than initially feared for most countries.

Research on the effects of the global financial crisis also shows that adjustment to shocks and policies can be very different across banks and markets. As the phases of the pandemic evolve, macroprudential authorities will have to take bank heterogeneity and country characteristics into account when managing financial stability risks. Policy responses will also have implications for cross-border capital flows, and for policy spillovers through banks as well as through other financial intermediaries. We present these lessons and discuss possible asymmetric recovery scenarios, focusing in particular on the roles of global banks.

Prudential policy spillovers through global banks

Changes in prudential measures can be a factor in international spillovers of lending through banks. "Spillovers" can reduce the effectiveness of domestic policy measures if, for example, higher inflows of credit are triggered at a time when authorities are trying to reduce already high credit growth domestically. Yet, under some conditions, international spillovers through global banks can also present an opportunity.

Consider a situation where policies that are needed to maintain financial stability might be in conflict with policies that are needed to support economic recovery. This is not an unlikely scenario. During the Covid-19 crisis, banks were encouraged to lend and to draw down their capital buffers if needed. Fiscal guarantee schemes supporting the real economy were used extensively, delaying or moderating loan losses on bank balance sheets. During the recovery phase, regulators need to decide on the timing and the level to which depleted capital buffers need to be restored. Once large credit losses materialise, the domestic banking sector might have to focus on rebuilding capital and on further balance sheet repair. This in turn could temporarily weaken the ability of domestic banks to support domestic growth and recovery.

International capital inflows from foreign banks may partly offset the weakened ability of domestic banks to support recovery: foreign banks with stronger capital positions could substitute domestic banks in lending and supporting the domestic recovery. This could be accomplished through cross-border capital flows, either directly to domestic borrowers or via internal capital market flows to affiliated branches that engage in lending. Such positive spillover effects in support of growth are stronger when global banks have stronger capital and liquidity positions. However, if tighter capital requirements restrict financing flows from global banks, policy trade-offs at the domestic level between economic and financial stability can be larger.

In addition, the nature of the prudential measure matters. Suppose policy measures focus on borrower-based measures such as loan-to-value (LTV) ratios on mortgage lending, tightening ratios in order to address the risk of overheating mortgage markets. This is also not an unlikely scenario as, in many countries, real estate prices have continued to surge even during the pandemic. In this case, authorities may want to restrict lending to overheated domestic markets from both domestic and foreign banks.

These examples highlight that spillover effects of prudential measures on cross-border lending can be positive or negative. To properly assess spillover effects, one must take into account the stance and nature of the prudential tools applied and the characteristics of the lending institutions. This in turn requires granular data on the policy instruments and the banks affected.

Predicting macroeconomic developments and future policy responses is, of course, not possible at the current juncture. However, evidence from the past can provide some insights into the potential effects of policy changes. The IBRN organised a cross-country effort on prudential policy spillovers through global banks, consisting of research by 15 country teams and two cross-country studies with researchers working in close coordination to use comparable data and methods. This work utilised a new database on prudential instruments covering 64 countries with quarterly data for the period 2000 to 2014, and recently updated through to 2018, jointly built by IBRN, the Federal Reserve and the International Monetary Fund (Cerutti et al., 2017).

Buch and Goldberg (2017) summarise the main conclusions of this joint research effort. This research shows that spillovers through lending growth cannot be ignored: they are significant in one third of the regressions conducted across 17 studies. Also, spillovers vary across prudential instruments and are heterogeneous across banks. For example, well-capitalised banks for which tighter prudential requirements are less binding, tend to expand their market shares and lend more than weaker banks.[3]

Country studies allow us to dig deeper into the mechanisms that are at work. For example, studies for German and US banks show that when foreign capital requirements were tightened, global banks expanded lending in their home locations (Berrospide et al., 2017; Ohls, Pramor, and Tonzer, 2017). German banks also tended to reduce lending abroad. For US banks, the reaction varied across types of policy instruments. In both countries, lending by hosted affiliates of foreign banks did not change significantly when the foreign parent country tightened capital requirements. For banks from both countries, the type of policy change matters: for example, global banks reduced lending to foreign localities that raised local reserve requirements, while they did not react much to changes in LTV ratios or concentration ratios abroad.

Changes in prudential instruments can also lead to market share repositioning across global and domestic banks. Studies for Canadian, French, Italian, and Dutch banks confirm a positive spillover effect: as prudential instruments abroad tightened, the banks tended to increase their foreign lending (Bussière, Schmidt, and Vinas, 2017; Caccavaio, Carpinelli, and Marinelli, 2017; Damar and Mordel, 2017; Frost, de Haan, and van Horen, 2017). Foreign banks thus acquired market share during a tightening episode, either because they were not directly affected by the tighter regulations or because the regulations were less binding. For example, well-capitalised banks may have been poised to expand their international presence when other countries increased capital ratios and constrained the activities of their own local banks. Some of the positioning and tendencies might be sensitive to the organisational form of a country's global bank exposures to foreign locations.

Overall, these findings suggest that changes in domestic prudential policies in response to the next phases of the pandemic could lead to spillover effects. The likely direction of these spillovers depends on the nature of the policy instrument used, the characteristics of banking sectors and types of banks affected, and the impact of the instrument on the ability of banks to lend.

Interaction between prudential policy and monetary policy

Prudential measures can also affect the transmission of monetary policy in various ways. Tighter prudential measures can, *ceteris paribus*, hamper the transmission of looser monetary policy,[4] which is one of the reasons why the macroprudential stance was relaxed in the wake of the Covid-19 crisis. Prudential policy can allow monetary policy to be more accommodative than would otherwise be the case: in the absence of macroprudential tools that address risks to financial stability, there may be constellations in which monetary policy is excessively restrictive in order to address side-effects on financial stability.

One channel through which macroprudential policy interacts with monetary policy can be the activities of global banks. In a research project by IBRN, six studies conducted jointly by 11 central banks and international organisations focused on how macroprudential policy affects the transmission of monetary policy and the propagation of shocks across borders. The results indicate that the interactions between monetary and macroprudential policies significantly alter cross-border bank flows (Bussière et al., 2020a). For example, there is evidence that US stress tests affect monetary policy spillovers to emerging market economies – EMEs (Liu, Niepmann, and Schmidt-Eisenlohr, 2021): while US banks lend more to EMEs when US monetary policy becomes

3 Other studies find similar results. For example, Norring (2019) uses a gravity model framework to evaluate spillovers from macroprudential measures for 157 countries. Her findings support the existence of cross-border spillovers from macroprudential policy. In addition, she also finds significant heterogeneity across countries.

4 A study for German banks shows, for example, that an increase in capital requirements is likely to attenuate the effect of monetary policy on interest rates, as it modifies domestic banks' lending abilities (Imbierowicz, Löffler, and Vogel, 2021).

more accommodative, this effect is stronger for banks with balance sheets that have fewer capital constraints according to scenarios embedded in the US stress tests. Avdjiev et al. (2021) take a cross-country perspective, using international banking statistics from the Bank for International Settlements (BIS), to distinguish the role of home and host factors in assessing prudential and monetary policy spillovers. The results indicate that not only the magnitude, but also the sign of the effects of prudential measures, can depend on the nature of the measures.[5] Finally, bank-level characteristics matter: in particular, the size of the bank (its global systemically important bank status specifically) plays a key role in the transmission of domestic monetary policy and its interaction with macroprudential policy in recipient countries (Bussière et al., 2020b).

2 Asynchronous recoveries and prudential policy: is coordination needed?

While authorities responded in a fairly synchronised way to the Covid-19 shock by using the flexibility in the existing regulatory frameworks, decisions need to be taken on when and how to tighten regulatory requirements. Looking ahead, the normalisation of prudential measures could occur at different speeds. Policy decisions need to take into account the uneven positions of banking systems, depending on the severity of the economic downturn, the business models of the banks and the types of fiscal programmes being channeled through banks. Prudential policy decisions will be even more complex in economies that do not recover quickly from the crisis. In such a situation, fiscal policy support might be required for longer, the capital buffers that banks have available to absorb losses may become exhausted, and prudential policy may have limited options to support economic recovery.

Does policy transmission across countries, potentially amplified by bank-level frictions, require international coordination of macroprudential policy? Deciding which policy changes are appropriate, and whether coordination is needed, is not a trivial task. The mere fact that cross-border banking activity responds to policy and liquidity shocks carries no normative policy implications: spillovers can be a sign that markets are integrated but they can also signal the contagion of shocks.

It is thus necessary to assess whether cross-border bank flows and global shocks can give rise to (positive or negative) externalities (IMF-FSB-BIS, 2016): there can be positive externalities if domestic macroprudential policy supports financial stability and lending abroad, but national policies can also be subject to leakage that weakens their effectiveness. Negative externalities can arise if, in response to a tightening of domestic regulation, risky activities migrate to other countries, or if individual market participants do not internalise their contribution to aggregate financial stability (Korinek, 2011). Likewise, negative externalities arise for countries if domestic regulatory policy tightening reduces the supply of credit to foreign countries needing this intermediation.

If negative externalities prevail, national policies alone may be insufficient, and collective action problems can arise that require international coordination (Viñals and Nier, 2014). If financial activity and financial stress cross national borders, collective action problems can lead to "too little" macroprudential policy action, from both a national and a global perspective. Coordination and the appropriate communication of policies is needed to define common minimum standards for resilience,[6] and decisions need to be taken on whether to coordinate and reciprocate policies at the bilateral, regional or multilateral level.

The European Systemic Risk Board (ESRB) provides an example of policy coordination and a designated regime for reciprocity.[7] While most of the responsibility for macroprudential policy lies at the national level with national macroprudential authorities and financial stability committees, in the case of the European Banking Union, the ECB has both coordination and asymmetric top-up power. Reciprocity rules apply to national measures; some are mandatory and some follow a "comply or explain" procedure. When implementing macroprudential measures, financial linkages among economies have to be taken into account as cross-border bank flows might lead to spillovers of macroprudential policies to other countries. The framework has been applied to several macroprudential policy measures, including the regulation of mortgage loans in Belgium, Finland and Sweden.

Recognising the importance of policy surveillance and coordination in the European context, the ESRB has also established a common monitoring framework for the financial stability implications of national fiscal measures.[8] During the first phase of the pandemic, fiscal tools have been used in a heterogeneous way, reflecting differences in the needs of national economies and in exposures to the Covid-19 shock, differences in fiscal space but also a potential lack of policy coordination.[9] Going forward, this may have implications for cross-border financial flows and financial stability, thus requiring coordination of policy across areas and countries.

Conclusion

Banking sectors have played an important role in the initial phase of the pandemic. Fiscal and monetary policies have been transmitted to the real economy through banks; supervisory policy has relaxed balance sheet constraints. This policy response has been bold and fairly symmetric across countries. As a result, banks have continued to lend domestically and the impact of the crisis on cross-border flows by more robust global banks has remained limited.

Going forward, the recovery is likely to be asymmetric across countries and sectors, requiring asymmetric national macroprudential policy responses. As corporate insolvencies resulting from the pandemic potentially increase in many countries, banks will need to play an important role for the recovery while potentially dealing with increasing loan losses and the restructuring of their loan portfolios. Policymakers will thus face difficult trade-offs when deciding on when and how to normalise policies. Normalising too soon may run the risk of cliff effects, while normalising too late may delay the necessary structural change both for banks and the real economy. Flows through strong and resilient global banks can potentially relax the credit supply constraints that otherwise might prevail in some locations they serve. Depending on bank and country conditions, cross-border effects of national policies and effects on financial stability abroad need to be considered and in some cases coordination of macroprudential policy responses could be warranted.

Surveillance of global banks will be particularly important during the next phase of the pandemic in order to improve our understanding of the impact of diversified business activities and of capital and liquidity positions on banks' ability to lend. Surveillance should also pay attention to the risks around a re-nationalisation of banks, as national authorities might be under pressure to protect domestic banking sectors from foreign competition and to use moral suasion to ensure that domestic banks continue lending to domestic firms. This may, ultimately, affect cross-border credit provision.

Recent research by the International Banking Research Network (IBRN) shows that monitoring the response of global banks to changes in policy requires taking a differentiated view. Policy spillovers through global banks are shaped by bank-level characteristics and the macroeconomic environment, and they differ across policy instruments. Surveillance of these issues can build on the extensive infrastructures and institutions that have been put in place since the global financial crisis in terms of access to microdata, stress-testing frameworks, methodological improvement, networks of international researchers, and established modes of cooperation among national authorities.

5 As BIS international banking statistics indicate both a bank's nationality (home country) and where it operates (host country), Avdjiev et al. (2021) can distinguish home and host policies. They find that home policies have larger spillover effects on cross-border US dollar lending than host policies. More specifically, the results suggest that the most important sources of spillovers for the home countries are interbank exposure and concentration limits, while for the host countries it is LTV caps.

6 All this may call for a benchmark standard for financial stability regimes, and regimes to preserve stability that are global, not local (Cecchetti and Tucker, 2015; Tucker, 2016). For discussions on the international policy coordination and the role of domestic policies, see also Rodrik (2019).

7 A recommendation for a framework on the voluntary reciprocation of macroprudential policy measures was published by the European Systemic Risk Board in 2015. See the website of the ESRB for details: *https://www.esrb.europa.eu/*

8 See *https://www.esrb.europa.eu/home/search/coronavirus/html/index.en.html#item1*

9 See *https://www.esrb.europa.eu/*

REFERENCES

Avdjiev (S.), Gambacorta (L.), Goldberg (L. S.) and Schiaffi (S.) (2020)
"The shifting drivers of global liquidity", *Journal of International Economics*, Vol. 125, July: *https://www.sciencedirect.com/*

Avdjiev (S.), Hardy (B.), McGuire (P.) and von Peter (G.) (2021)
"Home sweet host: a cross-country perspective on prudential and monetary policy spillovers through global banks", *Review of International Economics*, Vol. 29, No. 1, February, pp. 20-36: *https://onlinelibrary.wiley.com/*

Berrospide (J.), Correa (R.), Goldberg (L. S.) and Niepmann (F.) (2017)
"International banking and cross-border effects of regulation: lessons from the United States", *International Journal of Central Banking*, Vol. 13, No. 2, March, pp. 435-476: *https://www.ijcb.org/*

Buch (C. M.) and Goldberg (L. S.) (2017)
"Cross-border prudential policy spillovers: how much? How important? Evidence from the International Banking Research Network", *International Journal of Central Banking*, Vol. 13, No. 2, March, pp. 505-558: *https://www.ijcb.org/*

Bussière (M.), Cao (J.), de Haan (J.), Hills (R.), Lloyd (S.), Meunier (M.), Pedrono (J.), Reinhardt (R.), Sinha (S.), Sowerbutts (R.) and Styrin (K.) (2020a)
"The interaction between macroprudential policy and monetary policy: overview", *Bank of England working papers*, No. 886, Bank of England: *https://www.bankofengland.co.uk/*

Bussière (M.), Hills (R.), Lloyd (S.), Meunier (B.), Pedrono (J.), Reinhardt (D.) and Sowerbutts (R.) (2020b)
"Le Pont de Londres: interactions between monetary and prudential policies in cross-border lending", *Bank of England working papers*, No. 850: *https://www.bankofengland.co.uk/*

Bussière (M.), Schmidt (J.) and Vinas (F.) (2017)
"International banking and cross-border effects of regulation: lessons from France", *International Journal of Central Banking*, Vol. 13, No. 2, March, pp. 163-193: *https://www.ijcb.org/*

Caccavaio (M.), Carpinelli (L.) and Marinelli (G.) (2017)
"International banking and cross-border effects of regulation: lessons from Italy", *International Journal of Central Banking*, Vol. 13, No. 2, March, pp. 223-247: *https://www.ijcb.org/*

Cecchetti (S. G.) and Tucker (P.) (2016)
"Is there macroprudential policy without international cooperation?", *Center for Economic and Policy Research Discussion Paper*, No. DP11042, January: *https://cepr.org/*

Cerutti (E.), Correa (R.), Fiorentino (E.) and Segalla (E.) (2017)
"Changes in prudential policy instruments – a new cross-country database", *International Journal of Central Banking*, Vol. 13, No. 2, March, pp. 477-503: *https://www.ijcb.org/*

Damar (H. E.) and Mordel (A.) (2017)
"International banking and cross-border effects of regulation: lessons from Canada", *International Journal of Central Banking*, Vol. 13, No. 2, March, pp. 35-46: *https://www.ijcb.org/*

Financial Stability Board – FSB (2019)
"Evaluation of the effects of financial regulatory reforms on small and medium-sized enterprise (SME) financing": *https://www.fsb.org/*

FSB (2020)
"Evaluation of the effects of too-big-to-fail reforms": *https://www.fsb.org/*

Frost (J.), de Haan (J.) and van Horen (N.) (2017)
"International banking and cross-border effects of regulation: lessons from the Netherlands", *International Journal of Central Banking*, Vol. 13, No. 2, March: *https://www.ijcb.org/*

Imbierowicz (B.), Löffler (A.) and Vogel (U.) (2021)
"The transmission of bank capital requirements and monetary policy to bank lending in Germany", *Review of International Economics*, Vol. 29, No. 1, February, pp. 144-164: *https://onlinelibrary.wiley.com/*

International Monetary Fund, FSB and Bank for International Settlements (2016)
"Elements of effective macroprudential policies – lessons from international experience": *https://www.imf.org/*

Korinek (A.) (2011)
"The new economics of prudential capital controls: a research agenda", *International Monetary Fund Economic Review*, Vol. 59, No. 3, November, pp. 523-561: *https://link.springer.com/*

Liu (E.), Niepmann (F.) and Schmidt-Eisenlohr (T.) (2021)
"The effect of U.S. stress tests on monetary policy spillovers to emerging markets", *Review of International Economics*, Vol. 29, No. 1, February, pp. 165-194: *https://onlinelibrary.wiley.com/*

Nier (E.) and Olafsson (T. T.) (2020)
"Main operational aspects for macroprudential policy relaxation", *International Monetary Fund Special Series on COVID-19*, September 10: *https://www.imf.org/*

Norring (A.) (2019)
"Macroprudential policy spillovers and international banking - taking the gravity approach" *ESRB – European Systemic Risk Board Working Paper Series*, No. 101, September: *https://www.esrb.europa.eu/*

Ohls (J.), Pramor (M.) and Tonzer (L.) (2017)
"International banking and cross-border effects of regulation: lessons from Germany", *International Journal of Central Banking*, Vol. 13, No. 2, March, pp. 129-162: *https://www.ijcb.org/*

Rodrik (D.) (2019)
"Putting Global Governance in its Place" *NBER – National Bureau of Economic Research Working Papers*, No. 26213: *https://www.nber.org/*

Tucker (P.) (2016)
"The design and governance of financial stability regimes common-resource problem that challenges technical know-how, democratic accountability and international coordination", *Essays on International Finance*, Vol. 3, CIGI – Centre for International Governance Innovation, September: *https://www.cigionline.org/*

Viñals (J.) and Nier (E.) (2014)
"Collective action problems in macroprudential policy and the need for international coordination", *Financial Stability Review*, Banque de France, No. 18, April, pp. 39-46: *https://publications.banque-france.fr/*

PUBLISHED ARTICLES

Below are listed all of the articles published in the *Financial Stability Review* since 2015.
These studies are available on the Banque de France's website (*https://publications.banque-france.fr/en/*).

APRIL 2015 Financing the economy: new avenues for growth

The financing of the economy in the post-crisis period: challenges and risks for financial stability

Completing the single market in capital

What does the new face of international financial intermediation mean for emerging market economies?

Financing solutions to sustain the growth of SMEs and MTEs and lay the foundations for future competitiveness

Reviving securitisation

Supporting sustainable growth: the role of safe and stable banking systems

How a supplemental leverage ratio can improve financial stability, traditional lending and economic growth

Key initiatives to unlock bank lending to the European corporate sector

The impact of the new regulatory paradigm on the role of banks in financing the economy

Impact of financial regulation on the long-term financing of the economy by banks

Global banks and the adoption of the new regulatory framework: effects on the financing of emerging markets and developing economies

The opportunity cost of collateral pledged: derivatives market reform and bank lending

APRIL 2016 Financial stability in the digital era

Constructing the possible trinity of innovation, stability and regulation for digital finance

Digital banking and market disruption: a sense of *déjà vu*?

Digital risk: a strategic challenge and a growth opportunity for insurers

Systemic risk in payments

Financial institutions and cyber crime – Between vulnerability and security

Where are the risks in high frequency trading?

Making Europe's financial market infrastructure a bulwark of financial stability

Beyond technology – Adequate regulation and oversight in the age of FinTechs

The rise of fintechs and their regulation

The migration to online lending and the rise of private regulation of online financial transactions with business customers

Money and payments in the digital age: innovations and challenges

Future evolution of electronic trading in European bond markets

Emergence of big data: how will it impact the economic model of insurance?

Big data challenges and opportunities in financial stability monitoring

Implementation of real-time settlement for banks using decentralised ledger technology: policy and legal implications

High-frequency trading, geography concerns and the curvature of the Earth

APRIL 2017 The impact of financial reforms

Towards financial stability: A common good that needs to be consolidated and reinforced

Ten years on: fixing the fault lines of the global financial crisis

Safer than ever before? An assessment of the impact of regulation on banks' resilience eight years on

Measuring the impact of Basel III

The impact of financial regulation: a G-SIB perspective

Bank health post-crisis

Implementing an efficient resolution framework in the Banking Union:
lessons from the crisis and challenges ahead

Building a strong financial sector

National and supranational banking regulators: between delayed intervention and time inconsistency

Central clearing: reaping the benefits, controlling the risks

A systemic risk assessment of OTC derivatives reforms and skin-in-the-game for CCPs

Central clearing and risk transformation

Have post-crisis financial reforms crimped market liquidity?

A stability perspective of market-based finance: designing new prudential tools?

Macroprudential measures and capital controls: towards a framework for policy evaluation

APRIL 2018 Non-bank finance: trends and challenges

Between shadow banking and an angelic vision of the market: towards a balanced development of non-bank finance

Shadow banking and market-based finance

Interconnectedness: mapping the shadow banking system

Insights into the shadow banking system

Trends in global asset management: the rise of index investing

Market-based finance: Ireland as a host for international financial intermediation

Collateral damage

Changes in market-making: impact of technology and regulation

Back to the future: the increasing role of institutional investors in the Dutch mortgage market

Marketplace lending in the United States: changing patterns in access to credit through innovation

Corporate financing in the euro area and France: an analysis of developments

What risks do exchange-traded funds pose?

Moving beyond the shadow banking concept

Achieving the G20 goal of resilient market-based finance

JUNE 2019 Greening the financial system: the new frontier

Climate change: central banks are taking action

Climate risks: why each half-degree matters

Unlocking the strategic economic opportunity of clean and inclusive growth

The importance of being forward-looking: managing financial stability in the face of climate risk

Financial exposure: climate data deficit

Green finance, at the heart of the ecological transition

PGGM: a pension investor's perspective on accelerating sustainable finance

The European Commission's action plan on sustainable finance:
promoting a sustainable future in the European Union and beyond

Greater transparency and better policy for climate finance

Green finance: an African perspective

Financial Stability Review

Editor
Banque de France
39 rue Croix-des-Petits-Champs
75001 Paris

Publishing Director
Gilles Vaysset

Editorial Committee
Emmanuelle Assouan
Valère Fourel
Julien Idier
Dominique Rougès
Aurore Schilte
Edouard Vidon

Technical Production
Studio Création
Direction de la Communication

Printed by
Banque de France – SG - DISG

Registration of copyright
March 2021
ISSN 1637-4681

Internet
https://publications.banque-france.fr/en

The *Financial Stability Review* can be downloaded for free on the Banque de France's website
https://publications.banque-france.fr/en/liste-chronologique/financial-stability-review