

**FSR**

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April 2018

## **NON-BANK FINANCE TRENDS AND CHALLENGES**

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**Non-bank finance:  
trends and challenges**

**22**



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# **Introductory article**



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

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Governor  
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Non-bank finance is growing rapidly worldwide. According to the Financial Stability Board (FSB), it amounted to USD 160 trillion at end-2016, i.e. 48% of the financial assets held by financial institutions worldwide.<sup>1</sup> Within non-bank finance, certain credit intermediation activities are frequently grouped together under the term “shadow banking”. Although it is difficult to clearly determine the scope of shadow banking, two measures provided by the FSB enable us to sketch its outlines. According to the broadest entity-based measure, shadow banking amounted to USD 99 trillion at end-2016.<sup>2</sup> This includes all financial institutions other than central banks, banks, insurers, pension funds, public financial institutions and financial auxiliaries – in other words it covers entities such as investment funds, finance companies and investment firms. However, according to a narrower measure, based exclusively on activities<sup>3</sup> likely to pose a risk for financial stability, it amounted to USD 45 trillion at end-2016.

Beyond the figures, the terms used also count: should we refer to it as “shadow” banking, with its negative connotations, or rather as market-based finance or non-bank credit intermediation? So far, no consensus on the appropriate terminology has been reached. However, these semantic debates should not distract from the real risks associated with the growth of unregulated sources of financing, nor serve as a pretext for questioning the regulatory efforts made since the crisis with the sole purpose of promoting market financing.

While it is essential to complete the regulatory framework to ensure financial stability,<sup>4</sup> the role played by non-bank finance in promoting growth and innovation should not be overlooked. This 2018 edition of the Banque de France’s *Financial Stability Review* is therefore timely in that it sheds light on a much discussed – even disputed – topic. As a forum for dialogue and exchange, this review offers leading personalities from diverse backgrounds – academics, institutional and industry representatives – the opportunity of having an open debate.

We should now work towards a balanced development of non-bank finance. European companies need more capital to innovate. It is therefore essential to diversify sources of financing in Europe (1). However, non-bank intermediation can be a source of systemic risk, which must be prevented (2). This is why three priorities should guide regulators’ actions: understanding, testing and regulating (3).

## 11 Diversifying financing in Europe: more options and, above all, more equity

The banking system plays a central role in the financing of the real economy in the euro area: bank lending accounted for a little over 80% of the debt of non-financial corporations in 2017. The remaining 20% came from financial markets which, in Europe, are still the preserve of large companies. These proportions are reversed

1 See FSB, March 2018, *Global Shadow Banking Monitoring Report 2017*, data covering 29 jurisdictions accounting for over 80% of global GDP.

2 This scope corresponds to the other financial institutions (OFIs) category as defined by the FSB.

3 Outside the bank consolidation scope.

4 See the FSB’s work on mapping, the reform of money market funds, transparency of securitisation, reducing procyclicality in securities financing transactions and the interconnections with the banking sector.

in the United States, where market financing is more widespread and banks provide only 30% of total non-financial corporation debt.<sup>5</sup> Let us first do away with this pointless debate about market-based versus bank-based finance, and the misconception that the US system should be replicated in Europe: the idea is simply to give companies the choice of diversifying their sources of debt financing. However, fundamentally, the real debate lies elsewhere: it is about switching from debt to equity.

Catching-up economies, such as Europe in the post-war era or emerging countries today, finance themselves with debt because it is a well-established method. However, in economies that are close to the “technological frontier”, such as the United States and Europe, the key to growth lies in corporate innovation, and therefore in long-term equity financing: since it is riskier to finance innovation, it should indeed offer higher returns. Thus, the purpose of expanding capital markets is not to replace bank financing but to complement it: it must not only serve to diversify companies’ financing choices, but also and above all to promote equity financing for all companies, whether they are start-ups or growing businesses. The euro area is lagging far behind in this area: equity only accounted for 73% of GDP in the euro area at end-2017,<sup>6</sup> compared with 123% in the United States.

This welcome diversification of financing can be achieved through the development of sound securitisation in order to free up banks’ balance sheets and thus encourage the issuance of new loans, while providing safe assets to investors and offering bond market exposure to borrowers who generally do not have access to this form of financing, such as small and medium-sized enterprises. At the same time, the development of new forms of debt such as microcredit, solidarity-based finance and marketplace lending are filling some gaps, especially for micro-enterprises.

The diversification of financing also and above all requires an ambitious European framework.

We need to build a real “Financing Union for Investment and Innovation” to better channel our resources – a savings surplus of EUR 400 billion in the euro area<sup>7</sup> – into equity financing and innovation. This Financing Union must unite and amplify the existing initiatives, first and foremost the Capital Markets Union, but also the Banking Union and the Juncker Investment Plan. It requires making concrete progress in several areas: the revision of accounting rules, taxation and insolvency laws in order to facilitate cross-border investment, mainly in equity; the European-wide development of long-term savings products and investment vehicles such as venture capital funds; the completion of the Banking Union; and finally, the control of financial activities and risks that are of vital importance for the euro area, such as super-systemic central counterparties.

## 21 Preventing risks linked to non-bank intermediation

The extension of market financing in Europe should not, however, be to the detriment of financial stability. Certain activities in non-bank finance are intrinsically risky. The global financial crisis of 2007-08 brought to light the credit, liquidity, leverage and maturity risks associated with shadow banking, as well as the potential for these risks to spread to the rest of the financial system. Within shadow banking, open-end fixed income or money market funds, for example, face a high liquidity risk and are thus susceptible to runs, i.e. massive and sudden outflows of funds in the event of market turmoil.

It is therefore essential to set up a regulatory framework that preserves both the security of the financial system and ensures a level playing field. It is not a question of favouring one sector over another, be it banks or shadow banking. The existence of regulatory arbitrage opportunities could lead to the transfer of capital-intensive activities to less regulated, or even unregulated, entities, which would be counterproductive. Nor is there

<sup>5</sup> Sources: European Central Bank (ECB) for the euro area and Federal Reserve for the United States. The share of bank financing is calculated as the ratio of bank loans over total loans and debt securities. Loans are net of resident intragroup loans. Debt securities are expressed at nominal value.

<sup>6</sup> As at Q3 2017.

<sup>7</sup> 12-month current account surplus for the period ending in January 2018. Source: ECB.

any question of imposing banking regulations on shadow banking: since the risks are not the same in banking and shadow banking, capital requirements cannot be the same.

With the completion of the Basel III reform in December 2017, **the priority for financial regulation is no longer bank solvency, but the liquidity of non-banks.** This goal is all the more important as the latter are a growing source of financing for non-financial corporations in some European countries. This is notably the case in France, where the increase in the debt ratios of large non-financial corporations is being fuelled by market debt.

### 31 Priorities: monitoring, testing, regulating

#### Monitoring

Regulators' first priority is to gain a better understanding of who the shadow banking players are, in particular through the production of detailed data on this sector. The FSB's annual *Global Shadow Banking Monitoring Report* contributes to this approach by providing a detailed mapping of shadow banking entities. There is great diversity among entities and business models whose characteristics can differ greatly from one country to another. The particularly sophisticated structures of certain major non-bank players pose an even more complex challenge, as they render their operation opaque and call for an in-depth analysis. The priority now is to acquire a more precise knowledge of shadow banking data, in order to better understand the numerous interconnections between this sphere and the traditional players in banking and insurance, be they capital links or cross-holdings.

#### Testing

The second priority is to deepen, through the use of specific tools, the analysis of these interconnections, which are of a systemic nature. In particular, the

development of the non-bank sector raises the need for contagion models that extend to the entire financial system. It is also necessary to set up a framework for macro stress testing liquidity risk in order to measure the overall impact of shocks. This exercise would primarily cover investment funds, which are potentially susceptible to runs if they are open-end funds. These ambitious and complex models should be developed in a concerted manner at the international level in order to pave the way for a harmonised systemic stress testing framework: the FSB endorsed this principle in 2017; but there is a real risk that this will remain in the realm of wishful thinking and that no action will be taken.

#### Regulating

Lastly, the third priority is to develop a proportionate and consistent regulatory framework at the international level. The non-bank sector must be provided with micro-prudential and macro-prudential regulations tailored to its business model and risks, without strictly replicating the tools already in place for banks and insurance companies. At the macro-prudential level, extending the scope of risk assessment and prevention to the entire financial system is particularly important. However, our experience of macro-prudential measures outside the banking sector is still very limited: France is a pioneer in this area with its decision to introduce, as of 1 July 2018, a measure for large enterprises that also takes into account their market debt. Developing liquidity management tools for investment funds, as well as refining the measurement of their leverage is also one of the key projects being conducted by the FSB. It is also necessary to improve the transparency of shadow banking activities. In this respect, the entry into force in spring 2018 of two European regulations, the European Market Infrastructure Regulation (EMIR II) and the Securities Financing Transactions Regulation (SFTR), will provide a more detailed picture of derivatives and securities financing transactions in Europe, two market segments at the heart of financial interconnections.

#### **4| Conclusion**

After the considerable regulatory progress that has been achieved with the completion of Basel III, it is now time to look beyond banking. Market financing should not give rise to irrational fears, but nor should it be over-idealised. Rather, it should be seen as an essential addition to bank

financing for the efficient financing of the economy, including equity. The challenge now is to strike a balance between the development of long-term market financing and the management of financial risks; here too, closer international cooperation is essential, in order to take full measure of the interactions that exist between the different national financial systems.

# **Overview of the shadow banking sector**



# Shadow banking and market-based finance

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*Variants of non-bank credit intermediation differ greatly. We provide a conceptual framework to help distinguish various characteristics – structural features, economic motivations, and risk implications – associated with different forms of non-bank credit intermediation. Anchored by this framework, we take stock of the evolution of shadow banking and the extent of its transformation into market-based finance since the global financial crisis. In light of the substantial regulatory and supervisory responses of recent years, we highlight key areas of progress while drawing attention to elements where work still needs to be done. Case studies of policy challenges arising in different jurisdictions are also discussed. While many of the amplification forces that were at play during the global financial crisis have diminished, the post-crisis reform agenda is not yet complete, and policymakers must remain attentive to new challenges looming on the horizon.*

NB: This paper is an abridged version of Adrian and Jones (2018), which contains an extensive set of references. The views expressed in this publication are those of the authors, and do not necessarily represent the views of the International Monetary Fund (IMF), its management, or its Executive Board.

By helping to complete markets – for instance, by giving issuers new outlets for capital-raising when bank lending is unavailable, and providing lenders more avenues for portfolio diversification – innovations in non-bank credit intermediation (NBCI) might yield greater efficiencies and risk-sharing capacity. However, the global financial crisis and ensuing aftershocks have also brought into focus the risks to financial stability associated with NBCI. As such, this paper begins by laying out a conceptual framework for distinguishing features of shadow banking that make it a less resilient form of market-based finance, before addressing the following issues: how have the different forms of shadow banking and market-based finance evolved in the wake of the global financial crisis? Given the concerted regulatory and supervisory response since, where has most progress been made and where is there still work to be done? And, from a regional financial stability perspective, what are some of the more pressing policy challenges posed by emerging trends in NBCI?

### 11 Non-bank credit intermediation – a conceptual framework

An important policy question relates to the particular features of shadow banking that can make it a less resilient form of market-based finance. We present a stylised framework below that seeks to set out these differences along three dimensions: structural characteristics (see Table 1), economic motivations for intermediaries, and financial stability implications.

#### 11.1 Structural characteristics

- *Transformations of risk characteristics* – shadow banking activities can involve extensive transformation of risk characteristics. Key in this regard is credit enhancement associated with the pooling and tranching of risk, and/or implicit guarantees. While maturity and/or liquidity transformation is typically associated with all types of credit intermediation, leverage,

complexity, and opaqueness tend to be most prominent in the case of shadow banking.

- *Lengthy networks* – the risk transformations inherent to shadow banking are often performed along a chain of specialised and interconnected intermediaries, and can thereby involve the balance sheets of many entities. Other forms of market-based finance have reduced scope for spillovers as interconnectedness across financial institutions is much reduced.
- *Implicit private sponsor support* – while shadow banking activity often benefits from the presumption of private sponsor support (such as an implied credit guarantee or a credit line to an off-balance-sheet entity), the more resilient aspect of market-based finance finds expression in a self-supporting financing structure which does not require subsidised risk absorption.
- *Formal vs. indirect access to official backstops* – neither shadow banking nor market-based finance entities have formal access to official-sector backstops (i.e. discount window access and deposit insurance) in the manner of a traditional deposit-taking bank; however, shadow banks tend to benefit from indirect (backdoor) access due to their closer linkages with traditional banks.
- *Funding base* – the dominant feature of shadow banking liabilities is that they are principally short-term runnable instruments, while the more resilient funding base of market-based activity is reflected in longer-term and less-runnable financing.

#### 11.2 Economic motivations for intermediaries

- *Agency frictions and informational asymmetries* – misaligned incentive problems can be magnified in certain shadow banking contexts in the presence of a high degree of complexity, specialisation and opaqueness. These features afford agents scope to exploit informational asymmetries in a manner capable of generating

T1 A stylised view of the structural characteristics of credit intermediation

Characteristic	Traditional banking	Riskier elements of shadow banking activity	Resilient elements of market-based finance
<i>Examples</i>	<i>Commercial bank</i>	<i>Synthetic collateralised debt obligation (CDO), structured investment vehicle, constant net asset value money market fund (CNAV MMF), asset-backed commercial paper (ABCP) conduit</i>	<i>Direct lending by pension or sovereign wealth fund (SWF), distressed debt or private equity (PE) partnerships</i>
Key risk transformations	Liquidity, maturity, leverage	Credit enhancement, liquidity, maturity, leverage	Less emphasis on credit enhancement and less opaque vs. shadow banking
Institutions involved in intermediation	Single entity	Can be many entities, interconnected through collateral chains and credit guarantees	Single/few entities
Formal official backstop	Yes	No, but possibly indirect access	No
Implied private sponsor support	n.a.	Yes, can sometimes be contingent liabilities	No, insolvency remote for sponsor
Key features of funding base	Mix of debt and deposits, wholesale and retail-financed	Highly runnable	Less runnable

Source: International Monetary Fund.

negative externalities. The predatory lending practices of originators, and the adverse selection problems that allowed securitisation arrangers to retain high-quality loans while securitising the “lemons”, were prominent shadow banking examples prior to the global financial crisis.

- *Mispriced sponsor backstops and contingent liabilities* – because commercial banks benefit from direct access to official-sector backstops, their credit support lines to shadow banking affiliates can reduce the cost of the latter’s liabilities and leave investors with the presumption they are “money good”. Both features stimulate investment demand. In its purest form, resilient market-based finance has no need to exploit sponsor backstops or give rise to contingent liabilities.
- *Regulatory arbitrage* – shadow banking activities can also be motivated by the circumvention of capital, liquidity, taxation or information requirements to make activities profitable that might otherwise not be. A notable example

prior to the crisis was seen in the provision of bank guarantees to asset-backed commercial paper (ABCP) conduits that were structured as liquidity-enhancing guarantees, rather than credit guarantees, thus reducing regulatory capital charges by significant amounts.

### 113 Financial stability implications

Arguably the most consequential distinction between market-based finance in general, and relatively less resilient forms of shadow banking, is that the latter are more amenable to giving rise to systemic risk (not just contributing to variability in the market price of risk). While shifts in the price of risk induced by market-based financial frictions (like the herding of investors in response to past performance) can be an ingredient in systemic risk, other amplification mechanisms, like leverage and institutional interconnectedness, can be needed to generate systemic implications.

The mechanisms by which shadow banking activity gives rise to systemic risk can be traced back to its

structural characteristics and economic motivations. For instance, extensive risk transformations inherent in some shadow banking activities can act as stress accelerants and increase uncertainty premiums where the true nature of underlying risk is obscured; a high degree of interconnectedness opens up the path for stress transmission and cascade effects across institutions; the role of implicit sponsor backstops means that stresses experienced by some shadow banking entities can quickly metastasise into contingent liabilities for their sponsors, who may not have the capital or liquidity to absorb them; and the heavy reliance of some shadow banking vehicles on runnable forms of financing (including but not limited to wholesale markets) leaves them exposed to refinancing risk during periods of risk aversion.

The vulnerabilities associated with these structural features can be magnified under two conditions. First, where intermediating agents are incentivised to exploit regulatory loopholes and asymmetric information. And second, where policymakers do not have adequate policy instruments to address them (at least not in a timely manner). Severing the adverse feedback loop may require the ultimate backstop – the sovereign balance sheet – to be deployed to put out the ensuing blaze. This is a contingency that may only be available at great cost.

## 2I The post-crisis evolution

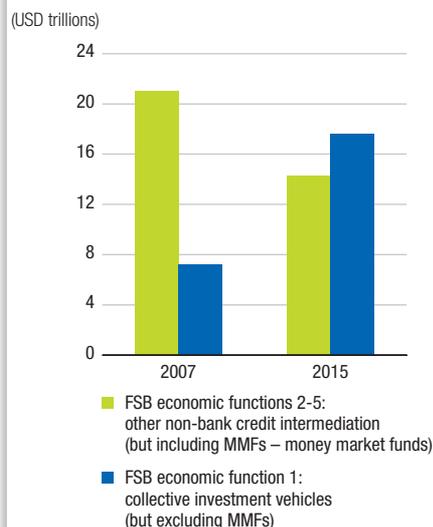
Among the key changes to have unfolded in global patterns of NBCI since the financial crisis, two stand out. At the activity level, there has been a material swing away from the riskier elements of shadow banking. And, at the geographical level, NBCI activity in emerging markets (EMs) has become increasingly prominent.

### 2I1 Less “toxic” shadow banking

The first notable trend, most pronounced in advanced economies, has been a reduction in the types of so-called “toxic” shadow banking activities that amplified the effects of the global financial

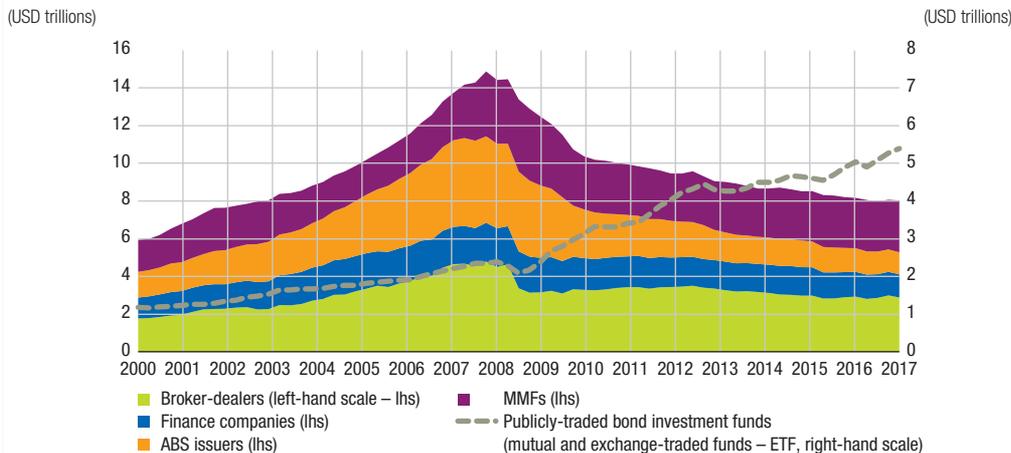
crisis. This has been reflected in a generalised flight to simplicity and transparency in the intermediation of non-bank credit, spurred by regulatory changes and a reorientation in intermediary business models. Because data inconsistencies and definitional issues at the cross-country level make attempts at precisely quantifying the size of this shift problematic, two sets of data help to make the general point. By one measure – based on the Financial Stability Board’s Flow of Funds data – a roughly USD 10 trillion swing toward standard collective investment vehicles can be inferred between 2007 and 2015, and a USD 6-7 trillion swing against all other types of NBCI (including some forms of undesirable shadow banking that created significant problems a decade ago – see Chart 1).

**C1 Global non-bank credit intermediation, by FSB economic function**



Sources: Financial Stability Board (2017a) and IMF staff.  
 Notes: Economic functions (EFs) as per the “narrow” measure in Financial Stability Board (2017a), but with MMFs moved from EF1 to the EF2-5 grouping. EF1 = collective investment vehicles (fixed income funds, hedge funds, real estate funds, fund of funds, mixed funds, pooled funds, and other funds). EF2 = finance companies, leasing companies, real estate credit companies, consumer credit companies, factoring companies, non-bank credit card issuers. EF3 = broker-dealers and securities finance companies. EF4 = financial guaranty insurers, mutual guarantee societies, mortgage guarantee insurers, insurance corporations, loan guarantee co-ops. EF5 = asset-backed and structured finance vehicles.

C2 US non-bank credit intermediation, by vehicle type



Source: Federal Reserve Board, Flow of Funds.

By another measure – focusing exclusively on the US Flow of Funds – a broadly similar trend emerges. This is evident in the fact that assets intermediated through (relatively simple, insolvency-remote) collective investment vehicles like bond mutual funds and exchange-traded funds have more than doubled since 2007, while the assets of broker-dealers, finance companies, asset-backed securities issuers and money market funds (MMFs) have almost halved (see Chart 2). Importantly, interconnectedness has also reduced.

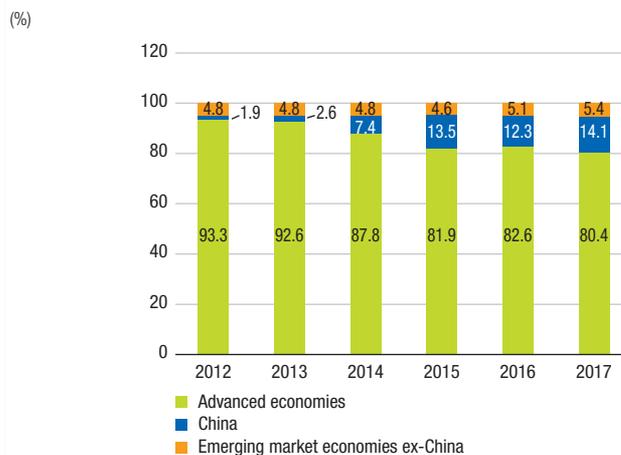
and MMF assets (see Chart 3), where the EM share of the global total has increased from 7% to 20% between 2012 and 2017 (largely accounted for by constant net asset value money market funds [CNAV MMFs] in China). One implication, addressed further below, is that, as NBCI in EM economies continues to increase in size and scope, ensuring that regulation and supervision is globally coordinated will take on increasing importance.

1 This measure includes financial system assets outside of those held by banks, central banks, public financial institutions, insurers, pension funds and financial auxiliaries.

2|2 Deepening in emerging markets

A second trend is the relative rise of NBCI activity in EM economies, consistent with the broader process of financial deepening. One (albeit imperfect) proxy for this can be seen in comparing the growth in assets of “other financial intermediaries” (OFIs) as compiled by the FSB,<sup>1</sup> where the EM share of the global total has increased from just 4% in 2011 to 11% in 2015. The upward trend has been observed both in China and across EMs more generally, while, among advanced economies, the United States and the United Kingdom have seen the largest relative declines. Different data sets point to broadly similar trends in the relative growth of NBCI in EM, such as non-core liabilities,

C3 Share of worldwide money market fund assets



Source: European Fund and Asset Management Association (EFAMA).

### 3I The strengthening supervision and regulation

#### 3I1 Taking stock of progress

Since the crisis, a concerted policy effort has been undertaken to strengthen the regulation and oversight of NBCI, with the aim of promoting more resilient forms of market-based finance. This effort has found expression in a variety of initiatives. Having designated shadow banking as one of its priority areas, the FSB has created a system-wide monitoring framework to track developments in the global shadow banking system, with a view to identifying the build-up of systemic risks and initiating corrective actions where necessary. The annual *Global Shadow Banking Monitoring Report* is a feature of this work. In Europe, the European Systemic Risk Board (ESRB) has begun a mapping of the EU shadow banking system, which feeds into the ESRB's Risk Dashboard, internal risk assessment processes and the formulation and implementation of related macroprudential policies. The International Monetary Fund (IMF) has been similarly engaged, by intensifying its supervision under the auspices of bilateral Financial Sector Assessment Programs (FSAPs) and Article IV Consultations, in addition to its multilateral surveillance work featured in the *Global Financial Stability Report*.

While an exhaustive review of all related regulatory reforms is beyond the scope of this paper (see FSB, 2017a, 2017b), a few elements of the reform agenda deserve mention. Among the most consequential have been the Basel III reforms, designed in part to ensure better recognition and capitalisation of banks' explicit and contingent exposures to shadow banking entities. Largely as a result, the off-balance-sheet provision of credit insurance by deposit-taking institutions has declined, helping to reverse the pre-crisis trend of growing interconnectedness between the traditional and shadow banking systems. Other important shadow banking reform priorities have focused on dampening risks associated with securities financing transactions (SFTs) and over-the-counter (OTC)

derivatives. These have included, for instance, reducing liquidity mismatches arising from nonbanks' use of SFTs; constraining excessive build-up of non-bank leverage with the imposition of haircuts on non-centrally-cleared SFTs; and reducing risks in OTC derivatives and tri-party repo markets through market infrastructure reforms. Two examples of shadow banking activities that caused significant problems during the crisis – MFs and securitisations – have since been placed on a sturdier footing by virtue of important reforms. Nevertheless, with much of the reform agenda still rolling out or in early stages of implementation, it is still too early to form concrete assessments of effectiveness.

#### 3I2 Outstanding priorities

What can be said with more certainty is that the job is far from done. Implementation of the policy framework for shadow banking entities remains at a relatively early stage. There are still lingering questions about whether some of the earlier-discussed economic motivations for shadow banking activities have been fully addressed, and whether risk has simply shifted toward corners of the financial system where policymakers have less visibility and fewer instruments to deploy. This is grounds for caution given the fact that systemic risk stems from market failures such as moral hazard, information frictions, agency problems, and coordination failures that afflict large institutions.

The issues of information asymmetries and agency problems are instructive in this regard. While some pre-crisis behaviours that exploited informational asymmetries and misaligned incentives in the mortgage market have been at least partially addressed, other incentive problems have proven more challenging to overcome. Credit rating agencies (CRAs) still overwhelmingly operate under the "issuer pays" model, in which incentives exist to assign more favourable ratings than warranted in order to win business. The potential for conflicts of interest to influence the ratings process remains most acute for structured finance products where

information asymmetries, barriers to entry and thus profit margins are highest. A number of proposals that could potentially make a difference to the CRA business model have yet to be implemented. In addition, while many countries have taken steps to reduce the mechanistic reliance of investors on CRA ratings, some elements of the Basel III capital rules continue to be based on them.

Other incentive-related issues in structured finance have proven similarly difficult to iron out, with the result that regulatory arbitrage remains a persistent threat, including at the cross-border level. For instance, many countries outside the EU and US are either yet to put into effect “skin in the game” rules, or have maintained exemptions that can dilute their effectiveness. There has also been only limited use of tools to address cross-border impacts in regimes where incentive alignment requirements governing securitisation activity have been introduced (International Organization of Securities Commissions [IOSCO], 2015). In addition, even in the two largest markets for structured finance, there are questions about whether the coverage of new retention rules has been adequate. And cross-border regulatory arbitrage risk continues to loom large in securities financing transactions where reforms enacted in the US have not been replicated elsewhere.<sup>2</sup>

As to the issue of mispriced implicit backstops – one of the key features of riskier forms of shadow banking – progress here has also been mixed. Supervisory guidelines to address banks’ “step-in risks” for non-contractual and reputational exposures will only be implemented in 2020. In the United States, reform of the US government sponsored enterprises appears to have stalled at a time where their share of mortgage-backed security (MBS) activity has expanded to 86%, up from 61% in 2006. The issue of implicit backstops has also become more pressing in some larger EMs, where all forms of NBCI, including shadow banking activity, is growing most briskly. And although regulators are now striving to support the issuance of higher-quality, more

standardised and more transparent securitisations as a means of contributing to a healthier overall credit mix,<sup>3</sup> the market response has generally been less than hoped for. Revitalised securitisation markets could play a more prominent role in addressing Europe’s non-performing loan overhang, for instance.

## 4I Regional case studies – policy challenges on the horizon

### 4I1 Credit intermediation in China

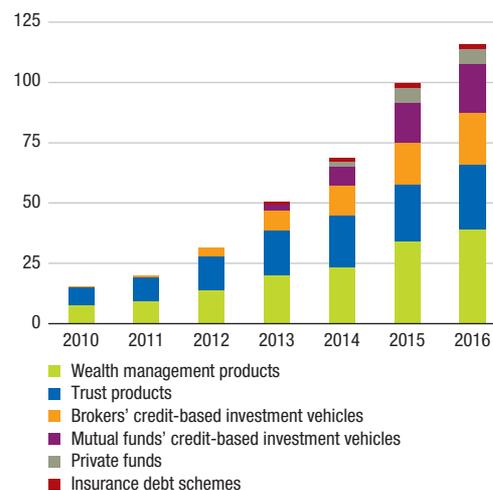
Fuelled by a high savings rate and liberalising reforms, China’s system of credit intermediation has become more inclusive and facilitated remarkably high and stable growth rates. However, the emergence of a relatively high credit-to-GDP ratio and a large credit gap – the product of rapid credit intermediation both in and outside the traditional banking system – is now attracting increasing attention from policymakers. Select NBCI activities have expanded by around 100% of GDP since 2010 (see Chart 4), a faster pace than for traditional bank loans.

<sup>2</sup> These reforms have culminated in the supervision of the two key tri-party service providers and a substantial reduction in potential financial stability risks associated with repo market infrastructure. For example, the share of tri-party repo volume that is financed with intraday credit from a clearing bank has declined from 100% as recently as 2012, to around 5% more recently (FSB, 2017a).

<sup>3</sup> See Bank of England and European Central Bank (2014), and European Banking Authority (2014, 2015).

### C4 Non-bank credit intermediation in China

(as a share of GDP, %)



Sources: CEIC, China Trusttree Association; IMF staff calculations.

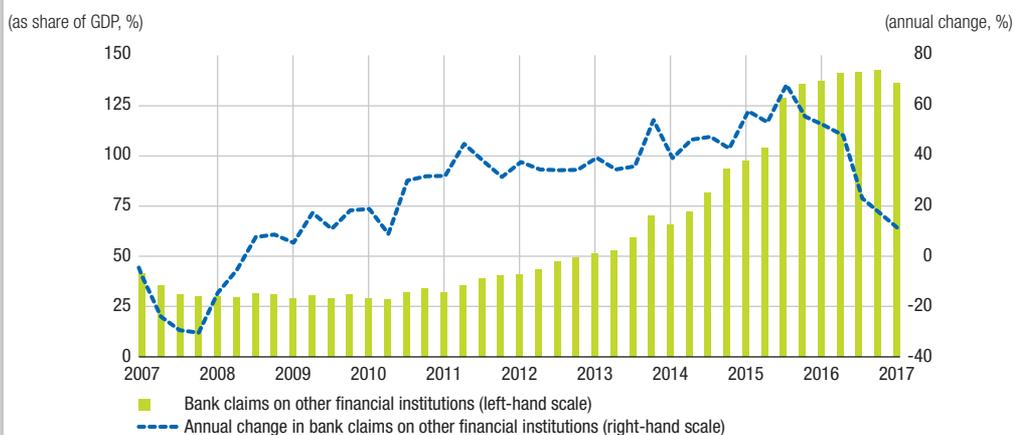
Aside from the sheer volume and growth of credit in China, certain features of NBCI activities are noteworthy in the context of our earlier framework. Extensive risk transformations are an important feature of NBCI in China: notably, credit enhancement and liquidity transformation. For instance, investors tend to perceive the expected returns discussed in investment prospectuses – which comfortably exceed those available on bank deposits – as guaranteed, even though the price of the underlying collateral that is backing such products (often corporate loans) is embedded with credit risk. These perceptions may be hardened by the unusually high proportion of securities and financial products that are assigned an AAA-credit rating by China’s domestic credit rating agencies. Additionally, credit intermediation in China is increasingly financed through short-term wholesale borrowing. Some of these risk transformations have also taken place across an increasingly interconnected and complex intermediation chain. Bank claims on other financial institutions have risen from less than 30% of GDP in 2010 to more than 130% currently (see Chart 5). As a share of their total assets, bank claims on non-bank financial institutions have doubled over the past decade to 25%, and their funding dependency on nonbanks has also risen notably. Furthermore, complexity and opacity in the shadow banking system has been exacerbated by the

numerous stages of loan channelling and layering of leverage, which makes “seeing through” to the risks of the underlying asset more difficult to assess for both investors and regulators (IMF, 2017a, 2017b).

As to the issue of official backstops, because the balance sheets of deposit-taking banks have become more closely intertwined with those of non-bank financial institutions, the latter have greater scope to avail themselves, indirectly, of the benefit from the official-sector safety nets – central bank liquidity and deposit insurance – that are only formally available to traditional banks. It is notable that many large non-bank financial institutions in China belong to the same financial holding group as traditional banks.

Although the growth of some forms of NBCI in China reflects the process of financial deepening, the motivation for some of these activities is potentially more troubling. For instance, capital charges imposed on banks for holding AAA-rated tranches of loan securitisations can be as little as one-quarter of those associated with retaining the underlying loans themselves. By selling these loans to off-balance-sheet vehicles and recategorising their economic exposure as investment claims, banks are afforded capital relief and able to circumvent regulatory ceilings on

**C5 Depository institution claims on other financial institutions in China**



Sources: People’s Bank of China and Haver.

loan volumes. Agency frictions and implied sponsor support can be similarly powerful motivators for NBCI activity. As a case in point, reputational concerns mean losses incurred on wealth management products – which are mostly off-balance-sheet and thus solvency-remote – might ultimately need to be absorbed by the distributing bank, given the preponderance of implicit guarantees. China’s MMF industry – now the world’s second largest – offers vivid illustration of many of these themes.

Encouragingly, policymakers have recently taken steps in response to the rising vulnerabilities. Most notable have been efforts to reduce avenues for arbitrage between the traditional and non-traditional banking sector; a strengthening of the enforcement of existing regulations; and a gradual unwinding in the presumption of sponsor support for wealth management products. Some of these efforts are bearing fruit, as shown by the deceleration in bank claims on non-bank financial institutions and off-balance-sheet wealth management products. Nevertheless, continued careful sequencing of reforms will be critical in facilitating an orderly adjustment to more sustainable modes of financing (IMF, 2017a and IMF, 2017b).

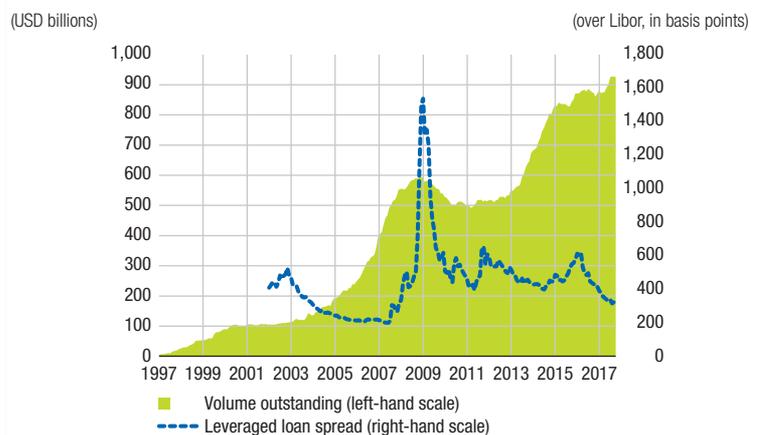
#### 4I2 Structured leveraged finance in the United States

While far fewer subprime mortgage loans are now issued and securitised, and the volume of complex securitisations is much reduced, select areas of the US structured finance markets have become notably buoyant in recent times. This is particularly evident in new issuance and pricing patterns in relatively low-rated leveraged and subprime auto loans.

In the case of the leveraged loan market, outstanding volumes are now more than 50% above the 2008 peak (see Chart 6). The share of loans at the riskier end of the rating distribution (B+ or below) has reaccelerated to near-record levels, along with the covenant-light share, and the average debt/earnings before interest, taxes, depreciation,

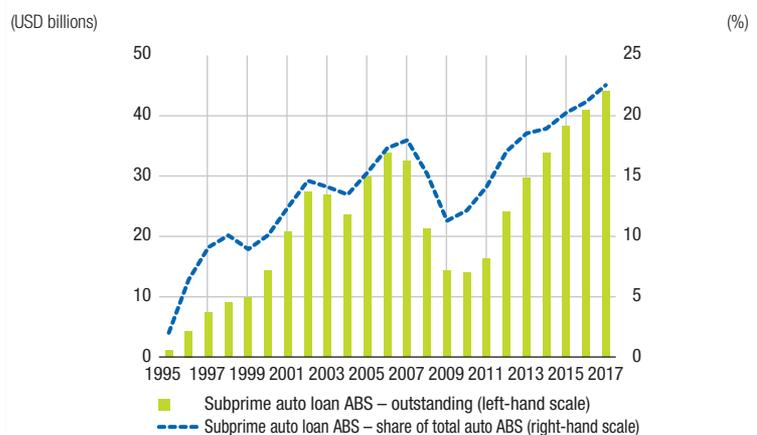
and amortisation (EBITDA) multiple on leveraged loans is at new highs. In response to a decline in underwriting standards, downgrades and default rates are picking up. Yet spreads remain at the low end of their historical range. A broadly similar set of dynamics – rising lower-quality issuance amidst a downgrade cycle and tight pricing – also appears to be at play in the US subprime auto loan asset backed securities market (see Chart 7).

C6 US leveraged loans: outstanding volume and spreads



Source: Standard & Poor’s, Leveraged Commentary & Data (LCD).

C7 Subprime auto loan asset backed securities



Source: Securities Industry and Financial Markets Association (SIFMA).

Nevertheless, while these developments suggest investors may be accepting risk premiums that are unusually low by historical standards, it is not clear that a repricing would have systemic implications. One reason is that the leveraged loan market is still only equivalent to around 5% of US GDP and, in absolute terms, is half the size of the subprime mortgage market at its peak. Another is that the distribution of leveraged loan exposure across investor types is better calibrated to risk absorption capacity than was the case for subprime mortgages, with the bank share of leveraged loans declining from around 25% a decade ago to less than 10% now,<sup>4</sup> a trend that may have been at least partly reinforced by stricter guidance issued by financial regulatory agencies in 2013. In the case of the subprime auto loan market, the relatively modest volumes involved – the stock of subprime auto loan ABS stands at around USD 50 billion (0.3% of GDP) – also means that the vulnerabilities remain sector-specific for the moment, rather than systemic.

### 4I3 The asset management industry – a European case study

The potential risks to financial stability posed by the largest segment of market-based finance, the asset management industry, have attracted growing attention in recent years. The FSB recently issued a set of policy recommendations to address structural vulnerabilities arising from asset management activities, relating particularly to liquidity transformation by investment funds; leverage within funds; operational risk and challenges in transferring investment mandates in stressed conditions; and securities lending activities of asset managers and funds (FSB, 2017c). Recent Financial Sector Assessment Programs (FSAPs) have also taken stock of these risks at the country level.<sup>5</sup>

The asset management industry presents some unique policy challenges. From the standpoint of financial stability, it is a greenfield area compared to banks. Even though collective investment vehicles like mutual funds have been in existence for decades,

the emphasis of regulation and supervision has traditionally been on consumer protection, not system-wide financial stability. And because asset managers are fundamentally different to banks – they are highly heterogeneous, typically act in an agency capacity rather than as principals, their vehicles are generally insolvency-remote, and they cannot avail themselves of an official backstop – the prudential policy framework developed for banks cannot be imposed on asset management firms or their activities. In addition to those issues raised in a recent FSB consultation, issues like the macroprudential effectiveness of liquidity management tools, the potential role of central banks as market makers of last resort, and the macroprudential targeting of asset owners rather than just asset managers, are just some of the areas of continuing analysis.

However, an informed assessment of potential stress amplification mechanisms first requires policymakers to have the right type of data. On this front, much remains to be done. While data gaps are common to all jurisdictions, three are highlighted below in the case of Europe's undertakings for collective investment in transferable securities (UCITS) industry, which increasingly represents the most widely recognised and widely adopted legal form of collective investment around the world.<sup>6</sup> First, it is difficult for supervisors to know the composition of fund unit liabilities once they are distributed by intermediaries (i.e. whether the beneficial owners are concentrated by geography or investor type), and thus know whether some funds are more vulnerable than others to synchronised runs. Second, the manner in which leverage data are collected in the funds management industry also makes it difficult to distinguish gross from net exposure, and whether derivatives are used for hedging or speculative purposes. These are not mere accounting semantics, but rather are quite fundamental to any assessment of possible risk accelerants. And more broadly, for special purpose vehicles established for activities other than securitisation, information available to European supervisors has also been limited, as these vehicles

4 In the context of the rising influence of institutional investors in the leveraged loan market, collateralised loan obligation (CLO) funds have become prominent. Although CLOs have generally performed well (vis-à-vis corporate credit and other structured finance products) over recent decades, their rapid recent growth and high rates of embedded leverage should keep regulators attuned to related stability risks.

5 Luxembourg, Ireland, the United Kingdom, Sweden, and the Netherlands are European examples.

6 It is important to note that it is the global reach of the European UCITS regime that motivates its inclusion in the discussion here, not because the issues cited are unique to it. Indeed the relative rigour of the UCITS regulatory regime is why it enjoys global support. UCITS are now available for distribution in non-EU countries including Switzerland, Hong Kong, Singapore, Taiwan, Chile, Peru, Bahrain, South Africa and Japan.

have typically resided just outside the regulatory perimeter. Encouragingly, European authorities now have a number of initiatives in train to help address these gaps. For instance, efforts are underway to provide more clarity on the categories of beneficial owners, and the use of leverage by investment funds. But a sustained and coordinated effort will be required to allow policymakers to collect and categorise data in a way most helpful in macro-financial surveillance.

## 51 Conclusion

This paper has sought to identify the particular features of NBCI which can make shadow banking a less resilient version of market-based finance. In addition, two broad conclusions can be drawn from our analysis.

First, much progress has been made, most notably in advanced economies, to ensure that many of the types of activities that amplified the impact of the global financial crisis no longer pose a systemic threat to financial stability. Securitisation practices have been strengthened, repo market activities have been overhauled, the MMF industry has been placed on a sturdier footing, and interconnectedness between banks and shadow banks has declined. Reform efforts have aimed at transforming the

structural characteristics of riskier aspects of shadow banking, as well as the underlying economic incentives. The business models and resilience of intermediaries have fundamentally changed as a result.

Second, policymakers and market participants should not be lulled into any false comfort that the job is done. In certain areas, like harmonising retention rules, reforming rating agency practices, and winding back implicit official backstops, there is still more to do. And important data gaps remain with respect to measuring cross-border interconnectedness, potential vulnerabilities associated with collective investment vehicles, and risk concentrations across institutions within specific industries (i.e. insurance). A key related priority is to ensure that regulation and supervision is globally coordinated and synchronised, as a defence against the return of cross-border arbitrage. Moreover, policymakers must stay attentive to the emergence of new challenges. The rapid growth of NBCI in EM economies, and new financial technologies,<sup>7</sup> stand out in this regard. For all the progress that has been made since the global financial crisis, it remains an open-ended challenge to mitigate the risks while preserving the benefits of all forms of credit growth, thus ensuring it supports productive risk-taking and economic growth well into the future.

<sup>7</sup> For a related treatment on FinTech, which is beyond the scope of this paper, see FSB (2017d), He et al. (2017), and Adrian and Jones (2018).

# References

### Adrian (T.) and Jones (B.) (2018)

“Shadow banking and market-based finance”, *IMF Departmental Paper*, January.

### Bank of England and European Central Bank (2014)

*The case for a better functioning securitisation market in the European Union*, May.

### European Banking Authority – EBA (2014)

*Discussion paper on simple standard and transparent securitizations*, October.

### EBA (2015)

*Report on qualifying securitisation*, July.

### Financial Stability Board – FSB (2017a)

*Assessment of shadow banking activities, risks and the adequacy of post-crisis policy tools to address financial stability concerns*, July.

### FSB (2017b)

*Implementation and effects of the G20 financial regulatory reforms – 3<sup>rd</sup> Annual Report*, July.

### FSB (2017c)

*Policy recommendations to address structural vulnerabilities from asset management activities*, January.

### FSB (2017d)

*Financial stability implications from FinTech: supervisory and regulatory issues that merit authorities’ attention*, June.

### He (D.), Leckow (R.), Haksar (V.), Mancini Griffoli (T.), Jenkinson (N.), Kashima (M.), Khiaonarong (T.), Rochon (C.) and Tourpe (H.) (2017)

“FinTech and financial services: initial considerations”, *IMF Staff Discussion Note*, 17/05, June.

### International Monetary Fund – IMF (2017a)

“Article IV Consultation – China”, *IMF Country Report*, No. 17/247.

### IMF (2017b)

“Financial Sector Stability Assessment – China”, *IMF Country Report*, No. 17/358.

### International Organization of Securities Commissions – IOSCO (2015)

*Peer review of implementation of incentive alignment recommendations for securitisation: final report*, September.

# Interconnectedness: mapping the shadow banking system

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*Systemic risk is the risk of collapse of the financial system resulting from interlinkages, such that the failure of individual entities or the collapse of an individual market can cause a cascading failure. The essence of systemic risk is interconnectedness. Theory gives some guidance: if negative shocks are small, a more densely connected financial network spreads risk and enhances financial stability. But beyond a certain point, dense interconnections support transmission and propagation of shocks, hence a more fragile financial system. Direct interconnectedness may arise from counterparty relationships and exposures, whether on the asset or the liability side. Indirect interconnectedness may arise when entities have common exposures, so that if one is forced into fire sales, the fall in asset prices affects the balance sheets of others. Indirect interconnectedness is also a feature of collateral chains, in which entities that have no direct relationship are nevertheless linked because one holds collateral originating from the other. Reputational risk can also connect an entity whose reputation suffers a blow (e.g. suspicion of illegal activity) to others believed to share similar characteristics, though they have no direct institutional or transactional relationship. In many such cases, there may be a danger of contagion. Particular concerns arise in derivatives markets, securities financing transactions (SFTs), wholesale funding markets, leveraged open-ended funds doing significant maturity or liquidity transformation, and central counterparties. In all these cases, the first step must be to get data that document the interconnectedness. This amounts to “mapping” the shadow banking system, i.e. documenting and analysing interconnectedness. That is essential to advance our understanding not only of shadow banking, but also of the overall environment within which Capital Markets Union (CMU) is to progress.*

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Nothing in this article represents the view of the Advisory Scientific Committee of the European Systemic Risk Board (ESRB), of which the author is Chair, nor of the ESRB Joint Expert Group on Shadow Banking, of which the author is Co-Chair. He receives an honorarium for his attendance at meetings of these bodies; and he receives a fee for his service on the Advisory Board of Nevastar Finance, for which the same disclaimer applies.

This paper will discuss interconnectedness among financial institutions (entities) and across financial markets, with particular attention to the shadow banking system. Even the term “system” here suggests a range of interconnections and interdependencies, which are deep and complex. Our data on these entities and activities are still very limited and are often accumulating unprocessed, despite major initiatives to throw light on the shadows. I shall focus primarily on the European Union (EU), where the latest collection and analysis of the data are in the *EU Shadow Banking Monitor* (European Systemic Risk Board, 2017). Some of the issues are closely related to the EU drive for Capital Markets Union (CMU) launched with an action plan in 2015 (European Commission, 2015).

CMU may be broadly understood as non-bank financial integration. Both price and quantity composite indicators of the degree of financial integration in Europe, starting from 1995, show considerable rises to a peak in 2006, then disintegration accentuated by the crisis to a trough in 2012 (European Central Bank – ECB, 2017). Integration has since resumed, but the indices are still not back to their 2006 levels. Roughly the same is true for individual subindices for bond and equity markets, except that both show troughs also in 2003. The analysis here, however, will exclude bond and equity markets, with the main attention to shadow banking and derivatives markets. Also, we shall not be concerned with individual entities – from a policy viewpoint, we are concerned with macroprudential rather than microprudential oversight.

We need definitions to proceed. Unfortunately, they are not precise. CMU is the move towards deeper and more integrated capital markets to complement bank financing – a true single market for market-based finance in Europe, with no barriers at national borders. Shadow banking has been defined as “market-based (or non-bank) financial intermediation”, but this is much too broad, because taken literally it does include

bond and equity markets. The Financial Stability Board (FSB, 2017) regards shadow banking as “credit intermediation involving entities and activities (fully or partly) outside of the regular banking system”. Again, this seems very inclusive. The European Systemic Risk Board (ESRB) is considerably less so (while using the term “broad”): “The broad measure of shadow banking in the EU, comprising total assets of investment funds, including money market funds (MMFs) and other financial institutions, amounted to EUR 40 trillion at the end of the third quarter of 2016. This measure includes all entities of the financial sector except banks, insurance corporations and pension funds.” Here markets are clearly not entities, if only because they do not have assets as included in the “broad measure”. On the other hand, the exclusion of insurance corporations and pension funds may be difficult to justify, whether analytically or for policy purposes.

In contrast to the slowdown in shadow banking in the United States, the rapid growth of the sector resumed in Europe after 2007-09. The demand for its services has come mainly from institutions and corporates seeking “safe” but non-zero yields. The huge growth in managed assets has led to a major expansion of the amounts channelled into shadow banking. On the supply side, much of the activity comes from regulatory arbitrage: developing organisational forms and transaction strategies that avoid regulation. This often involves substitution of shadow banking for “traditional” banks. It poses problems because it is not formally supported by safety nets yet may require bailouts. This creates moral hazard and a form of implicit subsidy.

Section 1 considers interconnectedness and systemic risk. Section 2 specifies the costs and benefits of interconnectedness. One cost is contagion, explored in Section 3. Section 4 details the risks associated with interconnectedness. Section 5 concludes with a discussion of available and forthcoming data and their use.

## 11 Interconnectedness and systemic risk

Interconnectedness is ubiquitous in the financial system, and it is key to systemic risk. The system is endangered if stress in an individual entity or activity is transmitted widely through various forms of interconnection. This is often called contagion, and we shall consider it below. A fundamental issue in evaluating financial integration is the balance between its benefits – more efficient allocation of capital, risk sharing – and the potential dangers posed by interconnectedness. When we think in systemic terms of the build-up of financial stress and vulnerability, our concerns arise from interconnectedness. With systemic vulnerabilities, shocks may propagate across wholesale funding markets, derivatives markets, and securities financing transactions (SFT).

Systemic risk is the risk of potential collapse of financial system resulting from interlinkages such that the failure of individual entities or collapse of a market can cause a cascading failure. Individual shadow banking entities may not seem large relative to major banks (still, recall American International Group's [AIG's] credit default swap [CDS] market presence before the crisis or consider BlackRock's balance sheet now). But tremors in the money market fund (MMF) sector, for example, can easily be transmitted.

A recent theoretical analysis (Acemoglu et al., 2015) finds that if negative shocks are small, a more densely connected financial network spreads risk and enhances financial stability. But beyond a certain size of shock, dense interconnections support transmission and propagation of shocks, hence a more fragile financial system. This seems to contrast with the early paper of Allen and Gale (2000), which finds that a network in which all nodes are connected to all others – a “complete” network – will be more stable than an incomplete network. But the complete network is an extreme case, and the earlier paper does not distinguish the size of the shock, which is key to the later results. Gai and Kapadia (2010) obtain results similar to Acemoglu et al.

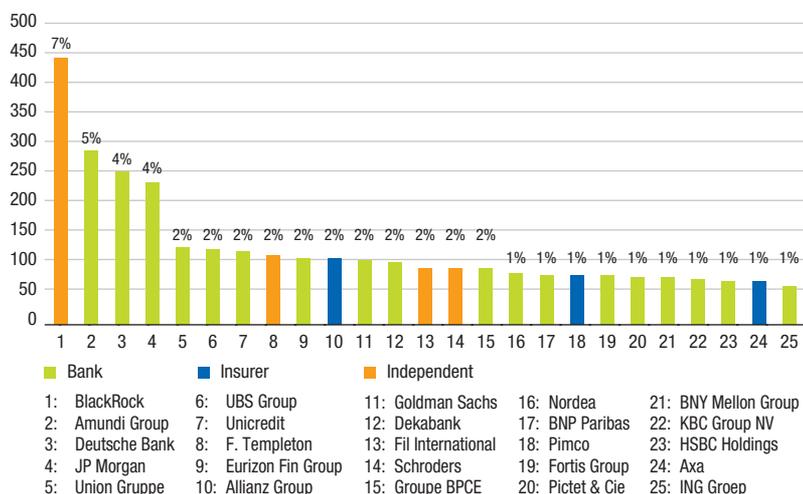
So dense interconnectedness may be a source of systemic risk if the shocks are large enough. What is “large enough”? Ex post, the failure of Lehman qualifies. But the “taper tantrum” and “flash crashes” of recent years were not, nor even the crisis in Cyprus. On the other hand, the discovery of a huge fiscal hole in Greece seemed to threaten the entire euro area financial system, to the point where the authorities were convinced of the need for a massive bailout. Suppose there had been at that time a true CMU, at least in the eurozone. Might the risks have been distributed sufficiently widely, or at least less towards banks and more towards non-bank finance, so that the expected impact of a Greek default would have been considerably less threatening? Or would asset managers holding Greek debt have been hit so hard that their European bank parents would have been imperilled? These questions suggest how important it is to have the data needed to map the European shadow banking system and its interconnections with the banks.

We must distinguish between direct and indirect interconnectedness. The former refers to direct counterparty relationships and the consequent exposures on balance sheets. The latter may include: relationships induced for entities with common exposures, when an action by entity A (e.g. “fire sale”) will affect the mark-to-market value of the assets of B; collateral chains, in which collateral offered by A to B may through a further transaction by B with C put this collateral on C's balance sheet, so we now have an indirect connection between A and C, in which A is exposed to the risk that C may not be able to deliver the collateral to B; reputational risk, when an action by A may harm the reputation of B, which is linked to it not as a counterparty, but only by having some perceived common characteristics or ownership link; and step-in risk, if A were to have to support B, to which it has perceived ties beyond contractual obligations to B that could induce reputational damage to A if B were to fail.



### C3 Top 25 asset management companies, ownership by sector

(Q3 2015; total net assets in EUR billions; share in the Lipper IM sample in %)



Source: Thomson Reuters Lipper for Investment Management (Lipper IM); European Central Bank calculations.

Notes: Asset managers are classified as held by banks/insurers when the asset manager is a subsidiary of the bank/insurer (this excludes cases where bank/insurance activities are a subordinate business of the group or where the holding company also holds banks/insurers) or have a bank/insurer as a majority shareholder.

### T1 Distribution of European Union institutions' exposures to shadow banking entities by country of domicile and type of shadow banking entity

(weighted by size of exposure)

Country/type of "shadow banking entity"	UCITS MMFs	Non-UCITS MMFs	Non-MMF investment funds	Finance companies	Broker-dealers	Credit insurers/financial guarantors	Securitisation	Non-equivalent bank/insurers	Other	Total
DE	0.0	0.0	3.7	1.0	0.0	0.0	1.2	0.0	0.4	6.3
ES	0.0	0.0	0.0	0.3	0.0	0.1	0.3	0.0	0.1	0.7
FR	0.7	0.0	0.5	0.6	0.0	0.0	2.2	0.0	0.4	4.5
GB	0.0	0.4	2.5	2.0	0.4	0.5	2.2	0.0	2.4	10.5
HK	0.1	0.0	0.5	0.0	0.6	0.0	0.0	0.0	0.1	1.3
IE	0.0	0.0	0.8	0.7	0.0	0.0	4.5	0.0	0.3	6.3
JE	0.0	0.0	0.2	0.1	0.0	0.0	2.7	0.0	0.0	3.0
JP	0.0	0.0	0.2	0.1	0.6	0.0	0.0	0.4	0.2	1.5
KR	0.0	0.0	0.0	0.2	0.0	0.0	0.0	1.9	0.5	2.6
KY	0.0	0.0	3.4	0.7	0.0	0.0	1.8	0.1	0.5	6.5
LU	0.3	0.0	2.3	0.7	0.2	0.0	1.2	0.0	0.4	5.2
NL	0.0	0.0	0.2	0.6	0.0	0.0	1.5	0.0	0.1	2.5
RU	0.0	0.0	0.0	0.1	0.0	0.0	0.0	1.7	0.1	1.9
TR	0.0	0.0	0.0	0.4	0.0	0.0	0.0	3.0	0.0	3.5
US	0.7	0.2	4.0	8.2	0.3	0.3	7.1	1.6	4.7	27.1
EU other <sup>a)</sup>	0.1	0.0	2.0	1.4	0.0	0.0	0.4	0.1	0.3	4.4
RW other <sup>b)</sup>	0.0	0.1	1.9	1.2	0.6	0.6	0.8	4.4	2.5	12.1
<b>Total</b>	<b>2.0</b>	<b>0.9</b>	<b>22.3</b>	<b>18.2</b>	<b>2.8</b>	<b>1.4</b>	<b>26.2</b>	<b>13.3</b>	<b>13.0</b>	<b>100.0</b>

Source: Abad et al. (2017).

Note: See list of countries on the previous page. GB : Great Britain.

a) Other European Union countries.

b) Rest of the world.

More seriously, there are issues regarding the regulatory perimeter. Those issues arise in acute form in Table 1, where we see that around 60% of the total exposure of euro area banks to shadow banks is with entities outside the EU.

There are many reasons for concern about the vulnerabilities of shadow banks and their interconnections among themselves and with the banks. Intermediation has gone from regulated banks to shadow banks without prudential regulation, deposit insurance, or lender of last resort (LOLR). Using volatile short-term funding (wholesale market) to finance long-maturity assets entails liquidity mismatch and maturity mismatch. Financial innovation (some generated to avoid regulation) may create opaque securities, often held in banks' off-balance-sheet vehicles. So a negative shock will come in a context where there are incentives for lenders to "run", hence borrowers may face rollover risk. Asset managers like BlackRock and Vanguard hold huge positions in a wide range of assets that are also held by other entities. If redemptions were to force them to liquidate some of these positions, the market impact could be substantial, with effects on other holders of the assets. And then we have the substantial exposures of banks to shadow banks explored by Abad et al (2017). For completeness at this stage, we should also note the particular vulnerabilities discussed in the *EU Shadow Banking Monitor 2017*: derivatives markets and synthetic leverage, securities financing transactions (SFTs), wholesale funding markets, leveraged open-ended funds doing significant maturity or liquidity transformation, and central counterparties (CCPs). There are specific reasons – in terms of liquidity transformation, maturity transformation, and leverage – for concern regarding these areas of the shadow banking system.

Finally, we note that interconnectedness (financial integration) gives rise to the "financial trilemma" discussed by Cecchetti and Schoenholtz (2017) and Berner (2017), following Schoenmaker (2011). They posit the inconsistency of three major

objectives: financial integration, financial stability, and national rather than supranational financial regulation. If we believe interconnectedness is not easily reversible, except as the consequence of a major crisis, and may indeed be desirable, then the argument suggests that we must choose supranational financial regulation if we wish to minimise financial instability. Many steps have been taken in this direction since the crisis, both through the FSB and the EU authorities, including for the latter the creation of several new supranational institutions.<sup>2</sup> But the national regulatory bodies are still very much there, and in most cases the European authorities can issue only recommendations to them, rather than binding regulations. So there is considerable "ring-fencing" and national policymaking that sometimes even stretches the limits of legality (EU regulations). The national authorities often put barriers in the way of cross-border financial flows and institutional integration – i.e. they directly limit interconnectedness. This is one source of the financial disintegration we saw after 2006 and the slow recovery of financial integration.

## 21 Costs and benefits of interconnectedness

Financial integration eases the process of financial intermediation, moving funds from savers to investors. It also promotes portfolio diversification, the erosion of home bias, and hence risk sharing across asset holders and across borders. The deeper markets and more extensive network of financial institutions should favour investment and economic growth. But as we have noted, an environment with wider and deeper interconnections in the financial system can be more sensitive to large shocks that might then threaten financial stability. Interconnections can heighten systemic risk.

Cross-border capital flows, facilitated by such interconnections, have long been recognised as a particular source of systemic risk. "Capital flow bonanzas" can lead to excessive domestic credit

<sup>2</sup> European Systemic Risk Board (ESRB), European Stability Mechanism (ESM), European Banking Authority (EBA), European Securities Markets Authority (ESMA), European Insurance and Occupational Pensions Authority (EIOPA), Single Supervisory Mechanism (SSM), Single Resolution Board (SRB).

growth, which the home financial system may be unable to intermediate well. The inflows then go into unproductive uses that do not create the export capacities needed to finance repayment; more important for our purposes, they may feed the accumulation of vulnerabilities in domestic financial markets that create systemic instability, and a sudden reversal of the inflows can itself lead to a crisis. Moreover, if the capital inflows go into the non-traded sectors, that will lead to an appreciation of the real exchange rate (relative price of traded and non-traded goods); real exchange rate appreciation is the single most reliable forward-looking indicator of financial crisis. And they are likely to contribute to asset price inflation, perhaps even bubbles. A common example is foreign investment in commercial real estate and housing.

Greater financial openness, integration, interconnectedness are likely to have contributed to the development of a global financial cycle, in which monetary impulses from financial centres (in particular, the United States) are transmitted to the rest of the world (Rey, 2016). This is doubtless related to the rising correlations of asset prices across financial markets. Together with the trend to passive investment (in index tracking funds and exchange-traded funds) and a fixation on short-term investment performance, this in turn creates a structural bias towards herd behaviour in asset management.

Evidently, interconnectedness is not responsible for all the ills of modern finance, nor even for all sources of systemic instability. But we must not ignore that financial integration comes with costs as well as benefits. And this is one reason for the wider acceptance post-crisis of the case for capital flow controls, as a potential macroprudential tool that could block some of the interconnections between domestic and foreign markets and the build-up of balance-sheet relationships between domestic and foreign entities. These can create special vulnerabilities if the domestic entities take on unhedged foreign currency liabilities.

Other macroprudential tools, such as limits on mortgage lending, seem to be less effective in financially more open economies and where financial systems are more sophisticated – i.e. where interconnections are deeper and more extensive (Cerutti et al., 2017). This empirical evidence on the effects of interconnectedness is directly relevant to structural vulnerabilities that might be created by CMU and efforts to mitigate such vulnerabilities.

### 31 Contagion

We must first distinguish between direct and indirect contagion, a distinction related to that between direct and indirect interconnectedness. Direct contagion occurs when following a negative shock, a counterparty to a transaction cannot or will not fulfil its commitments, so that there is a direct impact on the other counterparty. Indirect contagion can propagate through price effects or informational channels. Entities may be vulnerable to the same shocks, may have common exposures, may be perceived by markets to face related risks. If one must sell assets, others holding the same or related assets will experience a fall in their values that adversely affects their own balance sheets. Bad news about one firm may affect market perceptions of others and trigger hedging behaviour (Clerc et al., 2016). All these instances of both direct and indirect contagion operate through various forms of interconnections.

Informational contagion is of special interest in regard to asset managers. The higher the commonality of their portfolios, the greater the likelihood and extent of informational contagion, hence the greater the systemic impact of a shock perceived by one that becomes known to others (Allen et al., 2012). But there are also other systemic dangers posed by contagion that operates through bank ownership of asset managers, the extent of which we discussed above. Banks derive revenues from asset management fees and sales commissions; even if the entities in question may be off-balance sheet for the bank, it might undertake credit and

liquidity risk in respect of the asset manager that brings step-in risk; and market perceptions of problems in the asset management entity might bring reputational risk to the bank.

We note at this stage that conventional bank stress tests miss much if not all of these contagion effects, direct as well as indirect. But there is evidence that the second-round or feedback effects of a shock to an entity, operating through contagion, are considerably greater than those of the initial shock. In an agent-based model, Bookstaber et al. (2014) find that it is the “reaction to initial losses rather than the losses themselves that determine the extent of the crisis”. And because shadow banks are typically not individually as important systemically as large banks, their systemic importance derives from their interconnectedness and the contagion they can create.

### 4I Where are the risks?

Different risky shadow banking activities concentrate in different segments of the shadow banking sector (ESRB, 2017). We find liquidity transformation mainly in real estate funds and bond funds. Maturity transformation is particularly great in bond funds. Leverage is highest in real estate funds and hedge funds. And since asset managers have corporate bond funds and increasingly do direct lending to non-financial corporations, they undertake classic risks associated with credit intermediation.

There are more specific shadow banking risks, some of which are not yet well understood. One particularly opaque form of interconnectedness is the synthetic leverage created by use of derivatives. We now have the data to trace the interconnections, but the true extent of leverage created in this way is very hard to quantify in a form that gives comparability to conventional leverage. We do not even have a common definition of synthetic leverage at a global level. But ESRB (2017) clarifies it somewhat: “Synthetic leverage is a specific form of leverage which differs from financial leverage in

so far as it does not involve outright borrowings. Leverage can be created synthetically by generating unfunded exposures through derivative instruments which do not fully show up on the balance sheet, thus allowing a financial institution to control a larger amount of exposures with a smaller amount of invested capital.” The risks are the same as with conventional leverage created through borrowing.

Another growing risk in asset management, particularly important for real estate and bond funds, is the rising share of assets in “redeemable funds”, coupled with a trend decline in their liquid assets and portfolio shifts towards longer maturities (“search for yield”). Many now have redemption gates, but they have seldom been tested on a wide scale, and again interconnectedness might amplify the effects of doing so.

Perhaps the two most important examples of interconnections in the shadow banking sector are the repo markets and the central counterparty (CCP) set of entities. Much of the volume of activity in the repo markets is transactions between shadow banks and banks. Seizures in the repo markets are recognised to have been a key factor in the contagion observed after the failure of Lehman Brothers. The stated objective of CCPs is to reduce the likelihood of systemic risk arising from the failure of one counterparty and resulting chains of failure because of interconnectedness. But the size and complexity of the CCP sector and some of its individual entities, the inherent concentration risk, give cause for concern. Hence the authorities have rightly put considerable effort into designing rescue and resolution procedures for CCPs. Fortunately, they have not yet been tested.

Stress tests have not yet been applied in the shadow banking sector. We might think this a glaring omission on the part of the regulators, but the weaknesses of stress testing in the conventional banking sector suggest that it will be difficult.

Even the most sophisticated stress tests applied to banks do not take account of direct contagion

through exposures, nor of indirect contagion through deleveraging and fire-sale externalities. In the stress tests, the banks are passive, so the proxy for feedbacks is to increase the severity of the shocks (adverse scenario). This can be taken to the point of apparent absurdity. Cross-border effects are typically ignored – e.g. a bank in the jurisdiction of country A may have a major subsidiary in country B, but the stress test for this bank will focus on impact of change in macro conditions in country A. There is no attempt to incorporate the shadow banking system into bank stress tests, much less to stress test the shadow banks. In short, it is difficult to see how stress tests as currently carried out can be useful in assessing system-wide vulnerabilities.

## 5| Data

We have granular data on bank exposure to shadow banks (used in Abad et al., 2017). As yet, however, we do not have such data on the exposure of shadow banks to banks. Data that have been generated in response to the requirements of the Alternative Investment Funds Directive are in the hands of the national regulators, of which several have been dilatory in transferring them to the European Securities Markets Authority (ESMA). So there is as yet no such unified database which could be used by EU-level regulators or academic researchers. Impatience is justified, because these are granular data on the holdings of alternative investment funds, which will illuminate their interconnections with the rest of the financial system.

The role of academics here is important. These are “big data”. Manipulating them and bringing out

patterns, formulating appropriate models for empirical work and deriving results, all require the time and skills of experienced researchers. They may also be commercially sensitive, so it would not be possible to open them up to the private sector. But the possibilities have been illustrated by the success of collaborations between academics and staff from ECB and national authorities that have given rise to several papers recently published in the *ESRB Working Paper Series*. These use data generated by EMIR (European Market Infrastructure Regulation) reporting requirements. The data are collected by the ECB for every derivatives transaction effected within its jurisdiction. The research issues addressed include: “How is interest rate risk allocated within the banking sector and across other sectors?”; analysis of counterparty networks (interconnections!) in the centrally cleared interest rate derivatives markets in the EU; and measuring the systemic impact of a global adoption of multilateral portfolio compression in the EU over-the-counter (OTC) derivatives markets (interconnectedness, often explicitly in networks). These papers illustrate the tremendous potential payoffs offered by the availability of these data. The more recent Securities Financing Transactions Regulation will also generate data that can be used to understand the interconnections among banks and shadow banks in securities lending and repos.

This will enable us to map the shadow banking sector, i.e. to document and analyse interconnectedness. This work is essential to advance our understanding not only of shadow banking, but also of the overall environment within which CMU is to progress.

# References

- Abad (J.), D’Errico (M.), Killeen (N.), Luz (V.), Peltonen (T.), Portes (R.) and Urbano (T.) (2017) “Mapping the interconnectedness between EU banks and shadow banking entities”, *ESRB Working Paper Series*, No. 40, March.
- Acemoglu (D.), Ozdaglar (A.) and Tahbaz-Salehi (A.) (2015) “Systemic risk and stability in financial networks”, *American Economic Review*, Vol. 105, No. 2, February, pp. 564-608.
- Allen (F.), Babus (A.) and Carletti (E.) (2012) “Asset commonality, debt maturity and systemic risk”, *Journal of Financial Economics*, Vol. 104, No. 3, pp. 519-534.
- Allen (F.) and Gale (D.) (2000) “Financial contagion”, *Journal of Political Economy*, Vol. 108, No. 1, February, pp. 1-33.
- Berner (R.) (2017) “Globalization and financial stability”, Remarks delivered at the IMF 18th Jacques Polak Annual Research Conference, 2 November.
- Bookstaber (R.), Padrik (M.) and Tivnan (B.) (2014) “An agent-based model for financial vulnerability”, *Office of Financial Research Working Paper*, 14-05, September.
- Cecchetti (S.) and Schoenholtz (K.) (2017) “The other trilemma: governing global finance”, moneyandbanking.com, 24 July: <https://www.moneyandbanking.com/commentary/2017/7/23/the-other-trilemma-governing-global-finance>
- Cerutti (E.), Claessens (S.) and Laeven (L.) (2017) “The use and effectiveness of macroprudential policies: new evidence”, *Journal of Financial Stability*, Vol. 28, Issue C, pp. 203-224.
- Clerc (L.), Giovannini (A.), Langfield (S.), Peltonen (T.), Portes (R.) and Scheicher (M.) (2016) “Indirect contagion: the policy problem”, *ESRB Occasional Paper Series*, No. 9, January.
- European Central Bank (2017) *Financial integration in Europe*, May.
- European Commission (2015) *Action plan on building a Capital Markets Union: [https://ec.europa.eu/info/publications/action-plan-building-capital-markets-union\\_en](https://ec.europa.eu/info/publications/action-plan-building-capital-markets-union_en)*
- European Systemic Risk Board (2017) *EU Shadow Banking Monitor*, No. 2, May.
- Financial Stability Board (2017) *Global Shadow Banking Monitoring Report 2016*, May.
- Gai (P.) and Kapadia (S.) (2010) “Contagion in financial networks”, *Bank of England Working Paper*, No. 383, March.
- Rey (H.) (2016) “International channels of transmission of monetary policy and the Mundellian trilemma”, *IMF Economic Review*, Vol. 64, No. 6, May, pp. 6-35.
- Schoenmaker (D.) (2011) “The financial trilemma”, *Economics Letters*, Vol. 111, pp. 57-59.

# Insights into the shadow banking system

*Shadow banking is taking an increasingly significant role in financing the economy. For a long time, it was poorly understood. However, efforts were stepped up to better measure and oversee the shadow banking sector and it is now the focus of significant attention. Against this backdrop, the Financial Stability Board developed a regular shadow banking monitoring exercise tailored to the level of risk associated with non-bank entities and their intermediation activities. Thanks to this work, we now have a more precise picture of shadow banking in France, which notably sheds light on the importance of investment funds. Several regulatory initiatives are also being carried out concurrently to ensure that shadow banking risks are properly regulated and supervised.*

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The gradual development of a financial system that operated in parallel to the banking sector was at the heart of the push for disintermediation, decompartmentalisation and deregulation launched in the 1980s. The system, commonly referred to as shadow banking, relied on extensive use of securitisations and the expansion of securities lending activities.

The shadow banking system was thrust into the spotlight by the 2008 financial crisis, as it was accused of playing a central role in triggering it. Mid-2007, in the United States, the net assets of non-bank financial entities<sup>1</sup> exceeded bank assets by 48%. However, due to their systemic importance, it was the banks that first focused the attention of the authorities looking to improve the regulation of the financial system. It was only at the G20 Seoul Summit at the end of 2010 that the FSB was mandated with strengthening the supervision of the shadow banking system, consequently prompting work to identify the entities posing a risk to financial stability. Today, the results obtained mark the emergence of a harmonised definition that favours a more precise measure of shadow banking, and highlight the action taken by authorities to strengthen the oversight and regulation of risks.

## 11 The emergence of a harmonised definition

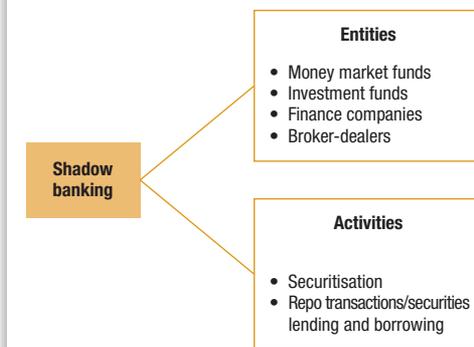
### 111 Entity-based approach vs. activity-based approach

Numerous authors and organisations have sought to define and map the shadow banking system. For example, the work of Pozsar et al. (2013) hinges on an entity-based approach that applies the two criteria of public sector credit guarantees and access to central bank liquidity. In the absence of these two criteria, the entity concerned is categorised as a “shadow bank”. Indeed, an inherent fragility is generated in a financial entity by the lack of access to central bank funding. Generally speaking,

<sup>1</sup> Government agencies or government-sponsored enterprises (GSE), financial companies, broker-dealers, issuers of asset-backed securities and agency-GSE backed mortgage pool.

<sup>2</sup> See ESRB (2017).

Diagram 1 Two approaches to defining the shadow banking system



Source: Banque de France.

the work undertaken has focused on identifying the best approach to take, i.e. an entity-based approach or an activity-based approach.

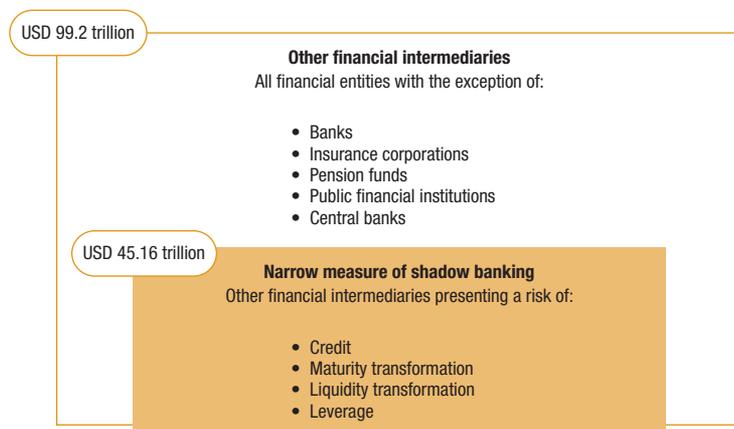
The entity-based approach appears inadequate due to the limitations of balance sheet data in terms of risk analysis, as they fail to provide accurate measurements of derivative instrument exposures, and also because it does not account for interactions between entities. Moreover, the entity-based approach is prone to a risk of discrimination against certain entities. Therefore, the activity-based approach is commonly applied. However, it has the advantage of providing a better picture of interactions between shadow banking entities and regular banking system entities.

In practice, the work of the FSB, and also of the European Systemic Risk Board (ESRB),<sup>2</sup> which has become the reference in terms of shadow banking mapping, overcomes the conflict between the entity-based and activity-based approaches by superimposing the two.

### 112 The work of the FSB: a more precise definition of the shadow banking system

The Financial Stability Board defines shadow banking as “credit intermediation involving entities and activities outside the regular banking system”.

Diagram 2 The scope of shadow banking according to the FSB definition



Sources: Banque de France and Financial Stability Board figures for 2016 (see FSB, 2018).

This credit intermediation activity traditionally refers to the type of financing provided by banks, which involves collecting deposits in order to grant loans to the real economy (households, corporates and government) or other financial institutions. This financing method generally involves:

- credit transformation on unsecured loans;
- maturity transformation, which consists of collecting short-term funds (bank deposits) to provide long-term financing (loans);
- liquidity transformation, in that banks use liquid liabilities (deposits) to grant less liquid or even illiquid loans;
- leverage, with banks granting more loans than they hold in equity.

In some respects, shadow banking entities amount to financial intermediaries that are not regulated in the same way as banks, even though they have bank-like financing activities (collecting funds rather than collecting deposits, transforming liquidity and/or maturity and, in certain cases, creating leverage). Shadow banking also includes

activities that play both short-term (for example repo transactions and securities lending) and medium to long-term financing roles (such as securitisations).

In 2015, the FSB sought to provide greater clarification by introducing a new measure to improve the monitoring of shadow banking developments. The underlying concept was that defining shadow banking as financial intermediaries other than banks, insurance companies and pension funds (other financial intermediaries) was inaccurate in that some of these actors were not involved in maturity or liquidity transformation. The FSB therefore set about “narrowing” the scope to all non-bank entities that are involved in intermediation activities and that may give rise to financial stability risks.

The “narrow measure of shadow banking” refers only to non-bank financial institutions whose intermediation activities pose a risk in terms of maturity or liquidity transformation, credit or leverage. On this basis, the FSB defined five economic functions (EFs) used to identify and classify shadow banking entities (see Table 1 and Box 1).

### T1 The five economic functions of the shadow banking system

Economic function	Entities concerned
EF1: Management of collective investment vehicles with features that make them susceptible to runs	Money market funds, fixed income funds, mixed funds, credit hedge funds, real estate funds
EF2: Loan provision that is dependent on short-term funding or secured funding of assets	Finance companies, leasing companies, factoring companies, consumer credit companies
EF3: Intermediation of market activities that is dependent on short-term funding or on secured funding of client assets	Investment firms that provide investment services (broker-dealers, etc.)
EF4: Facilitation of credit creation	Credit insurance companies, financial guarantors, monolines
EF5: Securitisation-based credit intermediation and funding of financial entities	Securitisation vehicles, structured finance vehicles, asset-backed securities

Source: Financial Stability Board.

#### Box 1

### Frequently asked questions on the shadow banking system

#### 1) Do all investment funds belong to the shadow banking system?

Shadow banking only encompasses funds subject to maturity, liquidity, credit and/or leverage risk, and therefore susceptible to run risks, or that introduce leverage in their management. Consequently, a specific framework is required in order to map the funds, identify and quantify their inherent risks (stress tests) and apply tailored supervisory measures (liquidity management tools such as withdrawal suspensions, lists of less liquid assets, reporting requirements, etc.).

#### 2) How should real estate funds be interpreted vis-à-vis the shadow banking system?

There are two types of real estate funds.

- **Closed-ended real estate funds** have a locked-in asset amount and their valuation is based solely on fund performance (no new capital injections after closing). Investors must find a buyer willing to purchase their units should they wish to withdraw from this type of fund.
- **Open-ended real estate funds** are subject to the same performance-related fluctuations but their assets are also exposed to changes resulting from additional investments in the fund or redemptions of units. In the case of net inflows (investments exceeding redemptions), fund managers have to acquire new real estate assets, although they do have a certain degree of freedom as to the timing of their purchases. In the case of net outflows, managers have to sell assets to meet investors' demands for liquidity. Open-ended real estate funds are therefore prone to liquidity risk as they are susceptible to runs. Some real estate funds can also take leveraged positions and therefore present an additional level of risk. Consequently, these funds fall within the scope of the narrow measure of shadow banking.

#### 3) Can a regulated entity belong to the shadow banking system?

Whether an entity is regulated or not is not a criterion for narrow measure inclusion or exclusion. In other words, an entity is not considered to be outside the narrow measure of shadow banking simply because it is regulated. For example, investment firms in France, with the exception of those that belong to a banking group, are included in the shadow banking system.

Based on this analysis, the following are excluded from the shadow banking system:

- non-bank entities not involved in credit and liquidity intermediation: for example other financial intermediaries without credit and liquidity intermediation activities such as equity funds and closed-end funds;
- entities that are consolidated into a banking group for prudential purposes and are therefore already subject to regulation, i.e. broker-dealers, finance companies and securitisation vehicles.

This approach involves a major mapping exercise that is updated annually on the basis of data collected from 29 member jurisdictions.<sup>3</sup>

## 21 Measuring shadow banking

Cooperation between FSB members facilitates information-sharing that allows the shadow banking economic functions to be identified in a more precise and homogeneous manner and standardised tools to be implemented across different jurisdictions.

### 211 USD 45.16 trillion unevenly distributed across countries

The annual monitoring exercise carried out by the FSB provides a consolidated picture of the size of the shadow banking system. Globally, it represented more than USD 45 trillion in 2016, or around 13.4% of total financial assets, compared with 40.1% for the banking sector.

The shadow banking system is primarily made up of collective investment vehicles (EF1), which account for the majority of activities in 24 of the 29 jurisdictions and represent more than 71% of total global shadow banking assets.

A large part of shadow banking is hosted by the United States, with 31.3% of total global

## T2 The main shadow banking countries

(assets in USD trillions, share in %)

	Shadow banking assets	Share of global shadow banking	Share of shadow banking in domestic total financial assets
Germany	1.7	3.8	11.0
China	7.0	15.5	14.3
United States	14.1	31.3	15.6
France	1.4	3.1	9.3
Cayman Islands	4.7	10.3	61.8
Ireland	2.3	5.2	46.2
Japan	2.8	6.1	8.2
Luxembourg	3.2	7.2	21.2
United Kingdom	1.5	3.2	5.4
<b>Total</b>	<b>45.2</b>		<b>13.4</b>

Source: Financial Stability Board, *Global Shadow Banking Monitoring Report 2017*.

assets, followed by China and the Cayman Islands with 15.5% and 10.3% respectively.

Furthermore, the weight of shadow banking in the financial sector varies considerably from country to country, representing 15.6% of the financial sector in the United States, 46.2% in Ireland and 61.8% in the Cayman Islands, for example (see Table 2).

### 212 Three structural factors behind the expansion of the shadow banking system

Shadow banking has taken off in recent years as a result of the combined impact of a valuation effect (see the *Autorité des marchés financiers* article [*infra*] on the increase in the value of assets under management in relation to expansionary monetary policies) and three key structural factors<sup>4</sup> (see Chart 1 *infra*).

- The first factor is regulatory arbitrage. As banks were eager to limit the increase in cost of capital resulting from the new banking regulations, they transferred a significant part of their capital intensive activities (securitisations that are not deconsolidated or securities financing) to third-party entities that were not subject to banking regulations. This transformation of their business model was intended to maintain bank profitability in the face of increasing costs of capital.

<sup>3</sup> See FSB (2018). The study covers 29 countries: Argentina, Australia, Belgium, Brazil, Canada, the Cayman Islands, Chile, China, France, Germany, Hong Kong, India, Indonesia, Ireland, Italy, Japan, Luxembourg, Mexico, the Netherlands, Russia, Saudi Arabia, Singapore, South Africa, South Korea, Spain, Switzerland, Turkey, the United Kingdom and the United States.

<sup>4</sup> See Clerc (2013).

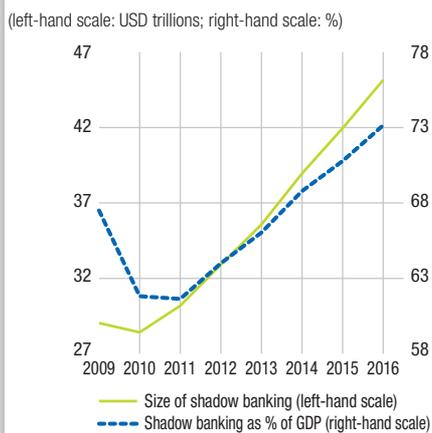
### Box 2

#### Difficulties of measuring shadow banking: the balance sheet approach and differences between accounting standards

While the FSB's annual mapping exercise is becoming increasingly precise and comprehensive, certain limitations remain.

- First, the approach relies heavily on balance sheet data at the expense of taking the risk level of the assets into consideration. Indeed, the data collected reveals the volume of assets for each economic function, but does not take account of the risk weighting that may be associated with those assets. Therefore, combined with the poor visibility of interactions between entities, it is currently difficult to clearly identify exposures that may exist between them. Efforts have certainly been made to address this, but for the moment they remain relatively limited. The ESRB in particular has taken an interest in the interconnectedness of shadow banking entities and regular European banking entities in order to better grasp the risks of possible contagion in the event of a shock (ESRB, 2017).
- Second, due to the different accounting standards applied by countries, it is difficult to harmonise the approaches. This is particularly clear, for example, in the case of EF3 (broker-dealers) where the methods used by France and the United States to calculate leverage ratios diverge significantly. Leverage is systematically higher in jurisdictions where International Financial Reporting Standards (IFRS) are applied, such as Europe and France, as the asset value used in the calculation is higher than that used when Generally Accepted Accounting Principles (GAAP) – and particularly US GAAP – are employed. This is the result of the different accounting treatment of derivative transactions. Under US accounting regulations (US GAAP), offsetting payables and receivables between two counterparties (and recording a net balance in the balance sheet) may not be automatic, but is common practise, on condition that a master netting agreement is in place. The IFRS are stricter: offsetting is only permitted if the agreement is legally enforceable in the country concerned; and above all, the agreement must impose precise guidelines for the right of set-off that exclude default due to bankruptcy of one of the counterparties, bind both parties to the agreement and forbid the transfer of the asset or liability concerned. This conflicting treatment reflects the long-standing debate between accounting and economic perspectives.

#### C1 Change in the size of the shadow banking system



- The second factor is related to changing investor profiles. Investors sought to diversify their risks away from the banking system and benefit from

an alternative to bank deposits that, moreover, earned them poor returns. Furthermore, the specific requirements of certain investors looking for “safe” assets led to a supply of alternative structured financing arrangements such as securitisations. By pooling fragmented savings and redistributing the risk via a complex structured arrangement (tranching of risk into low and high-risk portions to be marketed to investors based on their different risk profiles), the shadow banking system helped to finance banks and the real economy.

- The third factor is indivisible from shadow banking's role in collateral intermediation. Due to the relative scarcity of good quality collateral to meet the growing demand from financial agents seeking to reduce counterparty risk, the shadow banking system developed transactions that consist of lending out securities held in their portfolio as collateral against cash (repo transactions, securities lending

and borrowing) or re-using (rehypothecation) collateral received from other financial institutions (particularly banks) in other transactions.

Ultimately, the goal of these transactions is to obtain large volumes of secured funding that would otherwise be difficult for banks to raise by relying on deposits and unsecured funding alone.

### 2|3 Shadow banking in France: EUR 1,740 billion of assets and four major characteristics

Shadow banking in France represented EUR 1,740 billion, or 9.3% of total financial assets in 2016, of which 66% were held in investment funds (see Table 3).

The vast majority of shadow banking is regulated by the *Autorité des marchés financiers* (AMF – the French Financial Markets Authority) or the *Autorité de contrôle prudentiel et de résolution* (ACPR – the French Prudential Supervision and Resolution Authority), depending on the activity. Shadow banking in France has four major characteristics.

- Investment funds form a significant part of the shadow banking system in France. They also participate in credit intermediation through the purchase of debt securities or the acquisition of capital interests, thereby transforming maturities

and liquidity and/or using leverage. Depending on the underlying asset, they can take the form of money market funds, fixed income funds or mixed funds, but the weight of money market funds is particularly noteworthy. Money market fund liabilities are held in the short term for cash management purposes and their level of liquidity means they are considered equivalent to cash. They finance the banking sector and companies through the purchase of short-term securities, mainly certificates of deposit and negotiable debt securities. The main risk associated with investment funds is a possible loss of confidence that could lead to unit redemptions, forcing funds into distress sales of assets and thereby creating liquidity risk in the event of high sale volumes.

- Investment firms or broker-dealers (EF3) – that replaced the brokerage firms, securities firms and money market brokers – are often an extension of investment banks' market activities. There are two types:
  - entities prudentially consolidated into banking groups, and therefore already subject to ACPR supervision (91% of EF3 entities);
  - non-consolidated entities subject to equivalent prudential regulations (CRD IV) and ACPR supervision (9% of EF3 entities).

### T3 Breakdown of the shadow banking system in France in 2016

(amount in EUR billions, share in %)

Economic function	Entity	Amount	2016	
			Share of French shadow banking	Share of global shadow banking
EF1	Money market funds	351.7	20.1	18.4
	Fixed income funds	301.8	17.2	32.7
	Mixed funds	403.8	23.0	21.3
	Other funds	97.3	5.8	7.5
	<b>Subtotal</b>	<b>1,154.5</b>	<b>66,1</b>	
EF3	Broker-dealers	335.3	19.5	11.1
EF4	Mutual guarantee companies	23.2	1.2	0.4
EF5	Structured financial vehicles	226.8	13.2	8.9
<b>Total</b>		<b>1,739.9</b>		

Source: Banque de France, data submitted to the Financial Stability Board for its *Global Shadow Banking Monitoring Report 2017*.

It should be noted that the FSB's approach, which makes no connection between the regulatory status of an entity and its classification within the shadow banking system, is particularly appropriate in this case.

- Credit insurance companies and mutual guarantee companies are classified in EF4.<sup>5</sup>
- Structured financial vehicles in France (EF5) contribute to bank refinancing through the use of internal transactions.

<sup>5</sup> "EF4 entities facilitate the creation of credit, for example, when financial guarantors or monoline insurers extend various forms of guarantees to bank and non-bank financial entities, such as off-balance sheet commitments and derivatives." Source: *Global Shadow Banking Monitoring Report 2017*.

### 3I Action taken by the authorities to strengthen the oversight and regulation of risks

Over the past ten years, the FSB has worked under the impetus of the G20 on major projects to better prevent and control shadow banking risks. In

addition to the shadow banking mapping exercise described previously, four major priority areas structure the work undertaken to enhance oversight and regulation of risks.

#### 3I1 Reducing money market funds run risks

The United States and the European Union, in 2016 and 2017 respectively, adopted and implemented new money market fund regulations that were primarily intended to limit run risks during periods of financial market stress (see Box 3).

#### 3I2 Improving transparency and aligning information on securitisations communicated to investors

The European Union, with a view to greater capital market integration in Europe and acting on the basis of the work of the International Organization of Securities Commissions (IOSCO) and the Basel Committee

### Box 3

#### Money market fund reform

**In the United States**, the reform, adopted in July 2014 and implemented in October 2016, mainly covers the following aspects:

- conversion to floating net asset value (FNAV) from constant net asset value (CNAV) required for all money market funds (MMFs) other than those invested in sovereign securities (government MMFs);<sup>1</sup>
- implementation of tools such as liquidity fees (making redemptions more costly during times of market stress) and redemption gates (suspending withdrawals).

**In the European Union**, Regulation (EU) 2017/1131 on money market funds was published on 30 June 2017 and shall come into effect in July 2018, with the exception of certain articles that will come into effect in 2019. It imposes a number of requirements:

- rules on portfolio composition, exposure limits and asset valuation in order to ensure the stability of fund structures and guarantee that they invest in well diversified assets of good credit quality;
- common rules to ensure that fund managers have a sound knowledge of investor behaviour (regular stress tests) and that appropriate information is disclosed to investors and to the competent supervisory authorities (regular reporting of fund assets and liabilities);
- introduction of a new type of fund: low volatility net asset value MMFs (LVNAV MMFs) with extra safeguards to prevent runs.

<sup>1</sup> This decision led to massive shifts out of prime funds (mixed funds that invest in corporate or bank-issued short-term debt) and into government MMFs. As a result, US and European banks (the latter account for half of the prime fund banking sector exposure) that issued certificates of deposit in the United States saw the source of their financing dry up and turned mechanically towards other types of investors. They were thus forced to offer more attractive yields, which was reflected in an increase in LIBOR.

**Box 4**

**The European Union: simple, transparent, comparable securitisations**

The agreement between the European Parliament and the European Commission in May 2017 set out the following changes:

- Implementing STC (“simple, transparent, comparable”) securitisations:
  - simplicity refers to the homogeneity of underlying assets with simple characteristics and a conduit structure that is not overly complex;
  - transparency refers to providing sufficient information on underlying assets, the conduit structure and the transaction stakeholders to allow investors to properly assess the risks incurred; to further enhance market transparency, the introduction of a securitisation database is also planned;
  - comparability refers to more straightforward comparisons across securitisation products within an asset class.
- Introducing lower capital requirements for STC securitisations compared with non-STC securitisations.
- Strengthening market supervision under the joint responsibility of the ESRB and the European Securities and Markets Authority (ESMA).

to develop criteria to make securitisations simple and transparent, is in the process of adopting a STC (“simple, transparent, comparable”) regulation for securitisation activities (see Box 4).

**313 Reducing the risks associated with securities lending and borrowing and repo transactions**

These transactions present three types of risk: build-up of leverage; pro-cyclical effects; and contagion. At the end of 2015, the European Union

**Box 5**

**The European Union: securities lending activities**

Regulation (EU) 2015/2365 of November 2015, which came into effect in January 2016, imposed three new binding requirements:

- obligation to report securities financing transactions (SFTs) to central trade repositories;
- obligation to publish information on the use of SFTs and total return swaps;
- regulation of the reuse of financial instruments received under a collateral arrangement under three conditions:
  - the providing counterparty has been informed of the risks and consequences of reuse;
  - the providing counterparty has granted prior express consent;
  - the reused financial instruments are transferred from the account of the providing counterparty.

adopted a new regulation to improve the transparency of transactions and the reuse of financial instruments (see Box 5).

**314 Limiting interactions between banks and shadow banking entities**

The Basel Committee has issued guidelines on the identification and management of step-in risk (i.e. the risk that results from a bank providing financial support to a financial entity in difficulty, in the absence of any legal or ownership-based obligation, in order to avoid potential reputational risk). The aim is notably to:

- encourage banks to assess their external relationships and quantify, for entities where potential step-in risk exists, the potential impact on liquidity and capital in order to determine appropriate risk management action;

### Box 6

#### Basel Committee: step-in risk

The Basel Committee addresses the following objectives:

- ensuring that better account is taken of banks' investment in funds;
  - expanding the supervisory framework used to measure and monitor significant counterparty exposures to shadow banking entities;
  - ensuring that all banking activity interactions with the shadow banking system are properly captured within the prudential regimes.
- have a supporting supervisory monitoring framework in place;
  - impose, when a step-in risk is identified, a capital surplus measure. Moreover, the supervisory framework used to measure and monitor significant counterparty exposures was expanded to shadow banking entities (see Box 6).

## 4I Conclusion

Defining a suitable framework for the monitoring and prevention of shadow banking risks is at the core of regulators' concerns. Consequently, the

annual monitoring exercise carried out by the FSB is of great help in better understanding the sector and its challenges. In particular, thanks to the contribution made by French authorities, we now have a quite detailed picture of the entities that make up the shadow banking system in France.

Clearly, there is no shortage of challenges. Harmonising the scope of entities in the shadow banking system between countries continues to be difficult, the study of interconnectedness is still in its infancy and the various quantification exercises must be enhanced with a risk-based approach intended to better identify the possibilities of contagion to the financial system.

The key objective is to make shadow banking a robust and safe financing tool that works alongside the banking sector to support economic growth, rather than being in competition with it. Completing the initiatives underway and finalising the comprehensive collection of data are therefore essential. It is also vital to better identify and regulate the sector's structural vulnerabilities to liquidity risk and leverage build-up in particular. The Banque de France therefore fully supports the goal of developing macro stress testing exercises, which would provide a better understanding of shadow banking risks in general and the behaviour of investment funds during periods of significant financial market stress in particular.

## References

Claessens (S.), Pozsar (Z.), Ratnovski (L.) and Singh (M.) (2012)

“Shadow banking: economics and policy”, *IMF Staff Discussion Note*, 4 December: <https://www.imf.org/en/Publications/Staff-Discussion-Notes/Issues/2016/12/31/Shadow-Banking-Economics-and-Policy-40132>

Claessens (S.) and Ratnovski (L.) (2014)

“What is shadow banking?”, *IMF Working Paper*, February: <https://www.imf.org/en/Publications/WP/Issues/2016/12/31/What-is-Shadow-Banking-41334>

Clerc (L.) (2013)

“Le shadow banking en Europe”, *Revue d'économie financière*, No. 109, March, in French: <https://www.cairn.info/revue-d-economie-financiere-2013-1-page-17.htm>

European Systemic Risk Board (2017)

“Mapping the interconnectedness between EU banks and shadow banking entities”, *Working Paper Series*, No. 40, March: [https://www.esrb.europa.eu/documents/10180/1431348/Mapping+the+interconnectedness+between+EU+banks+and+shadow+banking+entities\\_paper.pdf](https://www.esrb.europa.eu/documents/10180/1431348/Mapping+the+interconnectedness+between+EU+banks+and+shadow+banking+entities_paper.pdf)

Financial Stability Board (2017)

*Implementation and effects of the G20 financial regulatory reforms – 3<sup>rd</sup> Annual Report*, 3 July: <http://www.fsb.org/wp-content/uploads/P030717-2.pdf>

Financial Stability Board (2018)

*Global Shadow Banking Monitoring Report 2017*, 5 March: <http://www.fsb.org/wp-content/uploads/P050318-1.pdf>

International Monetary Fund (2014)

*Global Financial Stability Report*, chapter 2 “Shadow banking around the globe: how large, and how risky?”, October: <http://www.imf.org/en/Publications/GFSR/Issues/2016/12/31/Risk-Taking-Liquidity-and-Shadow-Banking-Curbing-Excess-While-Promoting-Growth>

Pozsar (Z.), Adrian (T.), Ashcraft (A.) and Boesky (H.) (2013)

“Shadow banking”, *FRBNY Economic Policy Review*, December: <https://www.newyorkfed.org/medialibrary/medialresearch/epr/2013/0713adri.pdf>



# **Trends and changes of market-based finance**



# Trends in global asset management: the rise of index investing

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*The asset management industry is experiencing significant change across multiple dimensions: (i) extensive financial regulatory reform; (ii) increasing focus on environmental, social and governance (ESG) factors; and (iii) emerging use cases for financial technology (FinTech). Financial regulatory reform has led to new regulations for transparency and increased focus on fees, which in turn have increased the need for scale. Financial technology has emerged as a solution for regulatory reporting as well as for new ways to deliver products to investors and to identify investment opportunities. At the same time, clients and policymakers have increased their scrutiny of the role of investment stewardship and corporate engagement in the investment process.*

*These trends come together in index investing. This is a scale business that incorporates both financial technology and investment stewardship. Led initially by institutional investors, index investing has become more sought after by individual investors and their advisors, with index funds in essence democratising investing by offering low cost access to diversified investments. While a key driver of this trend is the growing awareness of the value proposition that index investment strategies offer, an increased focus on fees by regulators and investors and the shift in financial advice and distribution models towards advisers as portfolio managers are also key contributors to this trend.*

*In this article, we discuss the growth of index funds, the role of index funds in the capital markets, and the importance of corporate engagement by index fund managers.*

The asset management industry is experiencing significant change across multiple dimensions: (i) extensive financial regulatory reform; (ii) increasing focus on environmental, social and governance (ESG) factors; and (iii) emerging use cases for financial technology (FinTech). Financial regulatory reform spans new regulations addressing mutual fund reporting and registration, retirement saving, over-the-counter derivatives, money market funds, securitisation, transparency on fees, trading of securities and much more. This has created significant new regulatory requirements, which in turn have increased the need for scale in combination with increasing fee pressure. Financial technology – a term that broadly applies to the use of technology in finance to reduce intermediation costs, overcome market segmentation and other inefficiencies, and which covers areas well beyond asset management – has also grown considerably. Applications of FinTech in asset management include regulatory technology (RegTech) for regulatory reporting, digital advice for advising individual investors, big data analytics, electronic trading platforms, risk management for both institutional and individual investor portfolios, and a host of additional applications. Regulation will play a key role in the expanding applications of FinTech. Simultaneously, policymakers and clients have recognised the importance of investment stewardship in the investment process. As a result, there is increased focus on the fiduciary role of the asset manager who acts as the voice of the investor in corporate engagement, for example through engagement on ESG issues. Each of these changes is significant on its own and is worthy of additional discussion and analysis.

These trends come together in the area of index investing. Index investing is a scale business that incorporates both financial technology and investment stewardship to provide beneficial outcomes for investors at a low cost. While the trend towards index investing was initially led by institutional investors, index investing has become more sought after by individual investors and their advisors. Over the past few decades, many

asset owners have moved from owning individual stocks to investing in equity via mutual funds, as the principle of diversification has come to be understood as a core tenet of investment practice. Vehicles such as index mutual funds and exchange-traded funds (ETFs) that track transparent public indexes have effectively democratised access to low cost, diversified portfolios and have made index investing a cornerstone of investment practice today. Index funds are also highly scalable, enabling costs to be spread across a large investor base. In other words, index funds are diverse not only in their holdings, but also in their ownership. Technology enables asset managers to create funds that efficiently track a variety of different indexes, including those based on individual sectors or geographic regions, and those focused on value or growth or other factors. As index funds have made access to broad, diverse holdings available at a low cost, there has been a shift from traditional actively managed investment styles towards increasing adoption of index strategies as a core part of many investors' overall portfolios. A key driver of this trend is the growing awareness of the value proposition that index investment strategies offer, which has been accelerated by an increased focus on fees by regulators and investors and the shift in financial advice and distribution models towards advisers as portfolio managers.

Globally, investors' increasing use of index funds is driving a transformation in investment stewardship. While this has always been a part of an asset manager's fiduciary responsibility, index funds bring a new element to this discussion. Whereas a manager of an active portfolio can choose to sell the securities of a company that has had poor performance or no longer fits the investment thesis, an index manager is required to hold all of the companies in the relevant index based on the client mandate, and the manager cannot express disapproval by selling the company's stock. Instead, index managers advocate for shareholder interest through voting and engagement with the company's managers and directors. As a result, the responsibility to engage and vote is more

important than ever. In this sense, index investors are the ultimate long-term investors – providing patient capital for companies to grow and prosper. This comes with a responsibility to be engaged agents on behalf of the clients who are the true owners of the companies held in the fund. In recognition of this reality, a number of countries have embarked on defining a stewardship code or framework that identifies the responsibilities of asset managers to engage with companies and to vote the proxies.

The growth of index funds has attracted much attention. As with any transformational change, these funds have attracted a number of detractors. Some argue that index funds are disrupting equity markets, creating stock price bubbles, or even destroying the capital markets, and others claim that index funds are harming consumers through higher prices on certain goods and services. Policy measures proposed by some commentators would limit the diversification of index funds and would eliminate these funds by no longer allowing them to be able to replicate indexes. This index replication gives investors access to a broadly diversified portfolio, which is a core proposition of index funds. Likewise, policy measures that restrict voting rights are directly contradictory to various efforts by official sector entities to encourage more, not less, engagement.

This article examines the rise of index investing and its relative position in the equity markets today. In addition, we explore the role of index funds in the capital markets and address some of the hypotheses around the impact of index funds on stock prices. Finally, we discuss the fiduciary role of asset managers to engage with companies on behalf of their clients.

## 11 The agency model of asset management

To take a holistic view of the trends and developments in the global asset management industry, it is important to note that the agency business model in asset management sets asset managers apart from other financial institutions,

such as banks and insurers. Asset managers are agents that invest on behalf of clients, who are the asset owners.

Asset managers are hired by asset owners – clients with capital – to manage their investments. Asset owners include pension plans, insurance companies, official institutions, banks, foundations, endowments, family offices, and individual investors located all around the world. Asset owners can choose to either manage their portfolios themselves, outsource this role to asset managers, or pursue a combination of both. Importantly, asset owners make the overall strategic decisions on their portfolios, including asset allocation decisions.

We note that while we refer in this article to trends in the asset management industry, the majority of investable assets globally are managed directly by asset owners themselves. While estimates vary, this direct ownership accounts for somewhere between 60% and 76% of stocks and bonds.<sup>1</sup> Given that less publicly reported data on asset owners is available for assets managed directly by their owners, the investment styles they use to manage those assets can only be estimated – see Box 1 *infra*.<sup>2</sup> McKinsey estimates that approximately 24% of global investable assets are managed by external asset managers.<sup>3</sup> This includes assets managed in commingled investment vehicles as well as separate accounts.

Given the agency business model, asset owners are central to many of the trends and changes in the global asset management industry. Evolving client expectations and preferences play a significant role in the development of the industry as asset managers seek to deliver value and expertise in an evolving financial landscape. Rooted in the separation of “alpha” (the concept of extra return) from “beta” (the market return), investors of all sizes are increasingly building portfolios with risk budgets and fees allocated very deliberately to alpha and beta strategies, often resulting in a core index (beta) portfolio and smaller alternatives (alpha) investments.

<sup>1</sup> See McKinsey & Company (2013). IMF *Global Financial Stability Report* (2015) finds that the asset management industry intermediates 40% of global financial assets. Note that loans are not included in total global financial assets in this calculation.

<sup>2</sup> As estimated in Exhibit 2 of BlackRock’s *ViewPoint* (see 2017).

<sup>3</sup> See McKinsey & Company (2013).

### Box 1

#### Asset managers and asset owners

Asset managers manage portfolios for a diverse range of clients globally. Portfolio managers invest within guidelines specified by clients for a given mandate, as set out either in the investment management agreement (IMA) or established by the fund documentation.

Some portfolios are collective investment vehicles (CIVs), including US '40 Act mutual funds, undertakings for collective investment in transferable securities (UCITS), alternative investment funds (AIFs), etc., while others may be "separate accounts", for the management of assets belonging to a specific asset owner.

Client assets are generally held by third-party custodians, who maintain the official records and facilitate trade settlement with counterparties. As such, asset managers do not commingle their assets with client assets. Likewise, the client or fund, not the asset manager, is the counterparty to trades. Consequently, asset managers have small balance sheets relative to other types of financial institutions. Since assets under management (AUM) belong to clients, the investment results belong to the client.

Asset managers charge a fee based on the overall value of the portfolio. These fees range from single-digit basis points for index strategies to double digit basis points for active strategies. A small subset of portfolios include a performance fee. The investment results on a client's portfolio, whether positive or negative, belong to the client.

## 21 The rise of index investing

The early adopters of index investing were institutional investors, with pension funds leading the way. A large number of defined benefit plans use index investing as a core portion of their portfolios, and many defined contribution plans have incorporated index strategies into their offerings. Increasingly, investors of all sizes are building portfolios in which their fees and risk budget are allocated to a mix of active and passive strategies, which often results in a core index portfolio and smaller alternative investments. The last decade has seen the popularity of index investing grow significantly among individual investors, with index funds offering an unprecedented level of low cost access to diversified portfolios. Three of the most significant drivers of this trend are: (i) the growing awareness of the value proposition that index investment strategies offer in seeking to track, rather than beat, a benchmark index; (ii) increased focus on fees by regulators and

investors; and (iii) the shift in financial advice and distribution models towards advisers as portfolio managers. As a result, millions of individuals own shares in index funds either directly or through their pension savings vehicles.

Over the past few decades, increasingly end investors are looking at risk budgeting in their asset allocation process. A natural outgrowth of this process is the separation of alpha and beta mentioned earlier. Low fee index funds represent an alternative value proposition to active funds, in that instead of seeking to outperform a market index through active stock selection, index funds seek to track the composition and performance of an index as closely as possible thus providing low cost beta. Index providers and sponsors of index funds generally look to construct and track benchmarks that are (i) transparent, (ii) investable and (iii) strictly rules-based. This means that, while still requiring specialist expertise, the portfolio management process for index investments does

not require fundamental analysis of individual stocks, which facilitates lower expense ratios. Many asset owners, or managers acting on their behalf, employ a blend of both traditional active and low cost index strategies to meet different investment objectives.

While differentiating between active and index investment strategies is often a useful shorthand, in practice the investment landscape is better understood as a continuum of investment styles, each driven by a greater or lesser relationship to a benchmark index. At one end, a hedge fund may be managed according to an active absolute return strategy, with little relationship to any index, while at the other, index funds based on market capitalisation weighted indexes are clearly index-centric. In between, traditional active funds managed according to relative return strategies can range from concentrated portfolios with fewer stocks than the benchmark, and higher tracking error (positive or negative returns relative to the benchmark), as well as more diversified

portfolios that deliver returns more closely aligned to their benchmark.

Over the past few years, regulatory initiatives around the world have increased focus on the transparency of fees associated with investment products, from distribution costs to advisory fees to administrative expenses. For example, in 2013, the United Kingdom introduced its Retail Distribution Review (RDR), which effectively eliminated the payment of retrocessions to independent financial advisers. Likewise, in the European Union, the Markets in Financial Instruments Directive II (MiFID II), effective beginning January 2018, significantly enhances transparency and restricts the circumstances in which retrocessions may be paid.<sup>4</sup> In the United States, the Department of Labor (DoL) mandated increased transparency on fees for 401(k) plans in 2012<sup>5</sup> and the Fiduciary Rule, parts of which became applicable in 2017, applies a best interest standard to investment recommendations regarding individual retirement accounts.<sup>6</sup>

4 See Goh (2018).

5 *Code of Federal Regulations*, Title 29, Vol. 9, section 2550.404a-5 – Fiduciary requirements for disclosure in participant-directed individual account plans, 20 November 2017.

6 The DoL's Fiduciary Rule and related exemptions became applicable in June 2017, with some requirements delayed until July 2019.

## Box 2

### Developments in index construction

While index funds have been around for almost 50 years, providers of the indexes that serve as benchmarks for these funds can now leverage advances in technology and data to publish a broader array of indexes.<sup>1</sup> These indexes can be compiled according to methodologies that extend beyond traditional equity indexes that weight stocks by market-capitalisation, to those that weight stocks equally, by price, according to fundamental metrics, or other factors. These developments in index construction have facilitated the development of investment products that serve a wide variety of investor needs. Index investment products that track factor indexes are essentially designed to weigh specific factors, such as value, volatility, momentum, dividend yield, and/or size. Factor strategies can be applied to active or index portfolios, but in the context of index investing, they are often referred to as “smart beta”. Smart beta incorporates elements of both active and index: the benchmark is the result of an active process and the resulting portfolio replicates or tracks the benchmark. Factor strategies have generated increased interest as investors try to implement investment exposures that target risk and return profiles that differ from traditional market capitalisation indexes.

1 In the 1970s, asset managers created investment products that tracked the stocks and performance of financial indexes in the form of separately managed accounts and index funds. Index providers such as Morgan Stanley Capital International (MSCI), Standard & Poor's (S&P), Dow Jones and Financial Times Stock Exchange (FTSE), publish thousands of different indexes, covering a wide variety of countries, regions, industries, asset classes, and themes.

Each of these regulatory initiatives implicitly or explicitly encourages investors and their advisors, whether retail financial advisors or private wealth managers, to focus on fees in designing an overall investment programme. A shift in the financial advice and distribution industry from focusing on “products” to focusing on “portfolios” was already underway before these recent regulatory moves, as many financial advisers had changed their business model from being a “stock broker” who recommends specific stocks or funds and receives a commission on those sales to instead acting as an adviser for their clients’ overall portfolio, with a focus on asset allocation using in-house or third party model portfolios. Given that these advisers are charging an advisory fee on the overall portfolio, they often select low fee building blocks, such as index funds, that enable them to provide exposure to specific sectors or asset classes.

existing fund ranges to help meet the needs of both institutional and retail clients.

### 2|1 Sizing index investing

While much has been written about the growth of index investing, it is challenging to determine the size of this market. Investment styles can be expressed through a variety of vehicles – such as active and index mutual funds, hedge funds, and separate accounts. In the case of funds, data is publicly available; however, for separate accounts, there is no definitive public data source requiring estimates for this market segment.

In Table 1 we estimate the scale of investment styles and vehicles in the global equity market and find that equity investment via index funds is relatively small. The global investable universe for equities is an estimated USD 68 trillion in market capitalisation.<sup>7</sup> Index funds, including open-end funds and ETFs *combined*, represent

7 This number was calculated by BlackRock using primary sources as shown in Table 1. All dollar currencies in USD.

In light of these factors, many asset managers are launching new index funds, or extending

T1 Putting investment styles and vehicles in context: ownership of global equity stocks, by indexing, active and non-asset managed

	USD trillions of market cap owned	Percentage of total market cap owned
<b>Index</b>	<b>11.9</b>	<b>17.5</b>
Mutual funds	2.3	3.4
ETFs	2.7	4.0
Institutional indexing <sup>a)</sup>	5.4	7.9
Internal indexing <sup>a)</sup>	1.4	2.1
<b>Active</b>	<b>17.4</b>	<b>25.6</b>
Mutual funds	8.0	11.8
Institutional	7.5	11.0
Hedge funds <sup>a)</sup>	1.9	2.8
<b>Assets not managed by an external manager (excluding internal index investing)</b>	<b>38.7</b>	<b>57.0</b>
Corporate (financial and non-financial) <sup>b)</sup>	25.2	37.0
Insurance and pensions (defined benefit and defined contribution) <sup>a)</sup>	8.5	12.5
Official institutions <sup>a)</sup>	5.0	7.4
<b>Total</b>	<b>67.9</b>	<b>100</b>

Source: BlackRock.

Primary sources: World Federation of Exchange database (WFED), Securities Industry and Financial Markets Association (SIFMA), European Central Bank (ECB), Bank for International Settlements (BIS), Hedge Fund Research (HFR), Cerulli, Simfund (data as of December 2016), iShares Government Bond Index (GBI, data as of December 2016), and McKinsey data. “Non-managed assets” are assets not managed by an external asset manager (excluding internal index investing). Non-managed stocks (e.g. in individual brokerage accounts) are held by financial and non-financial corporations.

a) Estimated.

b) Includes individual stocks held by individual investors in brokerage accounts.

## T2 Percentage of US and EMEA equity market held by mutual funds and ETFs

(total in USD trillions, share in %)

	United States	EMEA
<b>Total equity market value</b>	<b>27.3</b>	<b>12.0</b>
<b>Percentage of equity market value held by:</b>		
Active mutual funds	16.8	14.4
Index mutual funds	6.3	2.5
ETFs	6.1	4.0

Source: BlackRock.

Primary sources: WFED, SIFMA, ECB, BIS, HFR, Cerulli, Simfund (data as of December 2016), iShares GBI (data as of December 2016) and McKinsey data.

USD 5 trillion, or 7.4% of the global equity universe.<sup>8</sup> If we include our estimates of institutional index investing and internally managed index investing strategies, the total market capitalisation of all index strategies is USD 11.9 trillion, or 17.5%, of the total equity universe.<sup>9</sup> The data provided is as of December 2016. While index investing has grown in 2017, the overall size of the market has also grown with rising company valuations. We do not expect the December 2017 percentage composition numbers will be materially different.

Given the global nature of this discussion, it is helpful to note that the relative proportion of investment via index funds is significantly lower in Europe, the Middle East, and Africa (EMEA) than it is in the United States as shown in Table 2. It is also important to note that although index funds continued to experience strong inflows in 2017, these percentages did not change materially as the overall equity markets grew significantly. The growth rate of index funds is high albeit from a relatively small base amount.

While index investing is currently growing at a faster rate than active strategies and has gained a greater market share in the United States than in Europe, the balance of active and index management is ultimately self-regulating, as we discuss in Section 3. Further, while differentiating between active and index strategies is often a useful shorthand for

discussion, in practice the investment landscape is not a binary choice between two styles, but rather a continuum of investment strategies, each driven by a greater or lesser degree of active or index management, and a greater or lesser relationship to a benchmark index. Hedge funds managed according to absolute return strategies may fall towards one end, and index funds towards the other, but the spectrum between these poles includes active funds, active ETFs, and factor ETFs, also referred to as “smart beta”. As a manager of investment strategies across this spectrum, we see important roles for each in portfolio construction for asset owners.

## 3I The role of index investing on capital markets

While the benefits of index investing to investors are widely recognised and the scale of index investing is currently small compared to active investment, some commentators have sought to examine the role that index investing plays in capital markets. In particular, they ask whether index funds have the potential to disrupt equity markets and/or to cause stock price bubbles, driving investment flows into the asset class, sector or region of the moment, only to see rapid price declines or liquidity issues when sentiment reverses.

In practice, investment products are tools for implementing the individual asset allocation decisions of asset owners.

In the absence of index funds, these decisions would be executed via an alternative means, such as individual stocks or active funds. Given the vast diversity of index benchmarks, strategies, and products available, index assets are not limited to a small set of static strategies, but rather are dispersed widely throughout the investable universe.

Trading in US equity markets was tested on 24 August 2015, when a rapid spike in volatility occurred against a backdrop of bearish global

<sup>8</sup> Commentaries often cite index funds as close to 40% of mutual funds, however, they omit the fact that mutual funds hold only 20% of the market capitalisation for equities.

<sup>9</sup> This number was calculated by BlackRock using primary sources as shown in Table 1.

market sentiment on stocks. With global equity markets down 3% to 5% before US market open, equity trading volumes surged as investors reassessed global growth prospects.<sup>10</sup> Excessive use of market and stop-loss orders that seek “liquidity at any price” inflamed the situation, leading to pricing gaps that triggered numerous trading halts. However, while the first hour of trading saw rapid, anomalous price moves in many stocks, exchange-traded products (ETPs), and closed-end funds (CEFs), for most of the day, the market functioned and remained accessible to investors at record-setting trading levels. A post-mortem analysis of 24 August 2015 revealed a number of technical issues related to equity market structure, including lack of synchronisation between futures and cash markets, timing problems with data feeds, and challenges with limit up limit down (LULD) rules. Some of these anomalies have subsequently been addressed. Harmonisation of trading rules among futures, options, individual stocks, and ETPs would be helpful in reducing complexity and conflicts; however, attempts to improve market resilience should only be undertaken if they also preserve the well-functioning processes through which equity securities, including ETFs, are traded today.

<sup>10</sup> See Bloomberg, as of 24 August 2015; BlackRock (2015).

<sup>11</sup> As shown in Exhibit 9 of BlackRock's *ViewPoint* (2017), we estimate the total amount of US equity stocks turned over by active mutual funds and index funds, calculated by multiplying relative AUM size by their respective turnover ratios. We estimate that active funds drive greater turnover of US equities than index funds do, showing that active funds clearly dominate stock trading flows.

<sup>12</sup> See MacKintosh (2017). Create/redeem flow is an average of USD 8.9 billion per day. This is 11% of all ETF trading but only about 5% of all US stock trading. US stocks traded USD 190 billion in 2016.

<sup>13</sup> There is no guarantee that a positive investment outcome will be achieved. The value of investments, and the income from them, may fall or rise and investors may get back less than they invested.

With regard to stock prices, the efficiency of capital markets in general has benefitted from leaps in technology, which continue to bring increasing information and transparency to stock markets. The price discovery process is still dominated by active trading. For every USD 1 of US equity trades driven by index strategies, managers seeking active returns (in excess of benchmark) trade approximately USD 22.<sup>11</sup> Due to the relatively low turnover and comparatively small size of index investing, trading driven by index investing plays a relatively small role in price discovery for individual stocks. The trading of ETF shares on exchanges in the secondary market does not directly drive buying and selling of the underlying stocks. Purchases and sales of stocks driven by the ETF creation and redemption process account for only 5% of all US stock market trading.<sup>12</sup>

The flows into index investment strategies reflect the disruptive change that is occurring in the industry. Changes in business models, changes in regulation, and changes in customer preferences all contribute to this outcome. While some active investment products have failed to beat their benchmarks, active funds that have exhibited strong performance have been able to generate significant inflows.

Despite the headlines, we are far from reaching an extreme concentration of index investing in the market, given that index investing overall comprises less than 20% of global equities. We believe that the balance in market share between index investing and active is ultimately self-regulating. Were the market share of index investments to result in stock pricing inefficiencies, active managers would react to any opportunities to profit from short-term fluctuations in individual stock prices. This could attract flows back into active management. In turn, this creates continuous adjustments to an equilibrium between the two styles.

Many market participants are working through the challenges of transitioning to new norms and business practices, and articulating changing value propositions to their clients. Policymakers are similarly following these developments in order to better understand the dynamics underlying the flows and the implications for equity markets looking forward.

### 4I The fiduciary role of asset managers in corporate engagement

Index funds provide long-term capital for thousands of companies.<sup>13</sup> In an environment where concerns are expressed regarding short-termism and the excessive focus on quarterly earnings, it is important to understand the role that index funds often play. Whereas a manager of an active portfolio can choose to sell the securities of a company that has had poor performance or no longer fits the investment thesis, an index manager

holds all of the companies in the relevant index and the manager cannot express its disapproval by selling the companies' stock. As a result, an asset manager's fiduciary responsibility to engage and vote on behalf of its clients, the asset owners, is more important than ever. In the paper "Engagement: the missing middle approach in the Bebchuck-Strine debate", my colleague Matthew Mallow and Jasmin Sethi expand on the idea of actively engaging with companies on corporate governance issues, which consists of more than simply voting at shareholder meetings.<sup>14</sup> Direct dialogue, or engagement, between a shareholder and members of the board or management of a company builds mutual understanding around governance issues and helps management anticipate when shareholders may be sufficiently concerned about an issue to vote against proposals put to the shareholder meeting.

One of the decisions that an asset manager needs to make as a fiduciary on behalf of clients is whether to create a dedicated investment stewardship team or outsource this function to a proxy advisory firm, such as Institutional Shareholder Services (ISS) or Glass Lewis. Many asset managers choose to outsource. As a result, proxy advisory firms are estimated to effectively determine between 10% and 25% of the votes in company meetings, depending on the investor base and company size. Even at the low end estimate, this voting block significantly exceeds the voting power of any index manager. ISS is the dominant player in this market with approximately 80% market share globally. Over the past decade, many investors have encouraged their managers to vote proxies and engage with companies as part of their fiduciary duty as asset managers. BlackRock, as well as several other large managers, has chosen not to outsource this function, except in limited circumstances. BlackRock has a team of over 30 investment stewardship professionals located in Europe, the Americas and Asia Pacific. We would describe ourselves as actively engaged – which is different from being an activist investor.

Both the public sector and the private sector have recognised this new paradigm. Globally, numerous initiatives encourage asset managers not to be "passive" shareholders. Stewardship initiatives include the EU Shareholder Rights Directive,<sup>15</sup> the UK Financial Reporting Council's UK Stewardship Code,<sup>16</sup> Japan's Principles for Responsible Institutional Investors,<sup>17</sup> the Netherlands' Best Practices for Engaged Share-Ownership,<sup>18</sup> and the Investor Stewardship Group's (ISG) Stewardship Framework for Institutional Investors.<sup>19</sup> At launch, participants in the ISG consisted of BlackRock, CalSTRS, the Florida State Board of Administration (SBA), GIC Private Limited (Singapore's sovereign wealth fund), Legal and General Investment Management, MFS Investment Management, MN Netherlands, PGGM, Royal Bank of Canada (Asset Management), State Street Global Advisors, TIAA Investments, T. Rowe Price Associates Inc., ValueAct Capital, Vanguard, Washington State Investment Board, and Wellington Management. In addition to these initiatives, the Organisation for Economic Co-operation and Development (OECD) engages in dialogue with companies on responsible business conduct.<sup>20</sup>

The central premise of the various stewardship initiatives is that investors, both asset owners and asset managers, have a responsibility to be actively engaged with the companies in which they invest, particularly where a company's approach to material ESG issues may impair long-term financial performance. Engagement by investors tends to focus on indicators of leadership and management quality since, in most corporate governance frameworks, investors elect board directors, who are responsible for overseeing and holding management to account. In these conversations, investors are explaining their policies and expectations on corporate governance.

Accordingly, given the board's central role in governance, board composition and performance is a long-standing topic of engagement. Investors are seeking board members who have expertise and experience relevant to the company's business

14 See Mallow and Sethi (2016).

15 Directive of the European Parliament and of the Council amending Directive 2007/36/EC as regards the encouragement of long-term shareholder engagement (13 December 2016): <http://data.consilium.europa.eu/doc/document/ST-15248-2016-INIT/en/pdf> (Shareholder Rights Directive).

16 See Financial Reporting Council (2012), *the UK Stewardship Code*. Signatories can choose to adhere to all or part of the Code. They use the Code for guidance on best practices.

17 See International Corporate Governance Network (2014), page 6.

18 See Eumedion (2011), page 5.

19 About US stewardship, see Investor Stewardship Group (2017), "About the investor stewardship group and the framework for US stewardship and governance": <https://www.isgframework.org/faq/>

20 See OECD (2017).

and long-term strategy, and the ability to devote the time required. Where board members do not appear to meet this standard, investors may vote against their re-election. More recently, the diversity of board directors has become a focus for investors in assessing board composition and quality. In complex and fast-changing environments, research shows that diverse groups take better decisions.<sup>21</sup> A board is ultimately a decision-making body so there is value in having diverse viewpoints in the boardroom; investors increasingly are demanding that companies factor diversity into their selection of board candidates and explain the diversity characteristics of directors.

Another issue investors engage on is executive compensation. Investors seek to understand the board's policies on executive incentives and how effectively they align with the returns to investors over time. Investors expect executive pay to be structured such that the company can attract talented, high calibre business leaders and reward them for the effective implementation of the company's long-term strategy and resultant generation of sustainable financial returns. In most markets, investors periodically have the opportunity to vote to formally approve the board's executive compensation policies and practices. As with board elections, investors concerned about a misalignment between executive compensation and investors' interests may vote against the so called "say on pay" proposal. A significant vote against would usually result in the board engaging with shareholders to better understand their concerns and expectations in advance of making changes to the policies.

Environmental issues are also a growing focus of engagement. The taskforce on climate-related financial disclosure (TCFD), the Principles for Responsible Investment (PRI), and the various regional sustainable investment forums (SIFs) are just a few examples of the numerous initiatives encouraging investors to engage more actively with companies on environmental issues. Environmental

and social considerations are generally not matters that come to a shareholder vote, so engagement is the main mechanism for investors to ensure companies are aware of any concerns. Even in the United States, where shareholder proposals may be used to raise environmental and social issues, not every company that faces ESG risks will receive a proposal. Most engagement and voting, in relation to environmental and social issues focuses on enhancing disclosures, so that investors and others can assess a company's approach to, and performance on, managing the resultant risk or opportunity.

In the past year, we have seen positive results from active shareholder engagement. For example, in 2017, BlackRock Investment Stewardship (BIS) voted for the first time in support of shareholder proposals seeking disclosure on the impacts of climate change policies at Exxon Mobil and at Occidental Petroleum. The decision to vote against management followed several years of engagement with senior management at both companies on a range of governance, including social and environmental, factors relevant to the long-term strategy and performance of the business. At Occidental, we also engaged with the appropriate board directors. Exxon had, until recently, a policy of not allowing direct dialogue between directors and investors. This led BIS to vote against the re-election of two directors in 2016 and 2017 to signal our concern about this policy that prevents the board hearing directly from investors their perspective on key governance matters. In addition, we engaged with the respective asset-owner proponents of the proposals to understand the nature of their engagement with each company.

We have continued to engage following the shareholder meetings, at which the proposals passed by 62% at Exxon and 67% at Occidental. We reiterated our position on the importance of detailed disclosure on the anticipated impacts of climate change on long-term strategy and performance. We also explained our expectations

<sup>21</sup> See Levine and Zajac (2007); Levine et al. (2014).

of the enhanced disclosures, which both companies committed to provide, and how we would use the information. This example illustrates the effectiveness of dialogue with the implicit sanction of a vote against management if a company is not responsive to shareholder concerns about corporate governance matters. BIS believes that our “engagement first” approach is effective for long-term investors with larger holdings as an unexpected vote against management by a significant block of shares can be unnecessarily disruptive to a company.

#### 4|1 Academic debate on passive management and engagement

Despite these potential benefits for investors, the growth of indexing has generated questions about the potential impact of index funds. A group of academics have raised questions regarding the impact of index funds on consumers. These academics claim that “common ownership” in concentrated industries induces higher prices for consumers, and they go on to suggest policy measures that would limit the diversification of these funds or restrict the voting rights of managers of these funds.<sup>22</sup> In addition to conflating the concepts of “ownership,” which reflects the investment interests of an asset owner and “agency management,” whereby an asset manager manages a portfolio on behalf of its clients, these hypotheses reflect a misunderstanding of shareholder engagement. The authors suggest that asset managers have an incentive to discourage competition amongst the portfolio companies when, in fact, asset managers have no such incentive. The investment results of the portfolio directly benefit the clients, and the asset manager generally earns a fee on the value of the assets under management. Notably, the authors fail to show a causal link between the actions of asset managers and any adverse outcomes for consumers. The initial academic studies have since been challenged by other academics, as is common in academic debates.<sup>23</sup> The subsequent papers question the assumptions, methodology

and conclusions of the initial analysis. In the meantime, consideration of policy measures is premature as there is no clear evidence that a problem exists.

## 5| Conclusion

The asset management industry continues to evolve. Looking back over the last 40 years, the industry leaders have changed significantly and the shape of the industry has changed. Storied names such as Bankers Trust, Brinson Partners, Miller Anderson & Sherrerd, and Wells Fargo Nikko Advisors no longer exist. We have seen growth of relatively newer entrants such as BlackRock and Vanguard as industry leaders measured by assets under management, in part driven by the index evolution. Likewise, there are a large number of private equity, venture capital, hedge fund, quantitative strategy, and real estate managers that have attracted assets from investors. These firms include Applied Quantitative Research (AQR), Blackstone, DE Shaw Group, Dimensional Fund Advisors (DFA), Fortress, KKR, Oaktree, and RenTech. This evolution has its roots in the separation of “alpha” (the concept of extra return) from “beta” (the market return). Increasingly, investors of all sizes are building portfolios where they allocate their risk budget and fees very deliberately to alpha and beta strategies, often resulting in a core index (beta) portfolio and smaller alternatives (alpha) investments.

Index funds are a critical component of this trend as they give even the smallest investor access to a low cost diversified portfolio. Given the large number of indexes which include broad markets as well as specific sectors, geographic regions, and capitalisation sizes, index funds provide long-term capital to thousands of companies. For many asset managers, this change is disruptive. As with any transformative change, questions have been raised regarding the role and impact of index funds. As discussed in this article, index funds are still a relatively small component of the

<sup>22</sup> See Azar, Schmalz and Tecu (2017); Antón, Ederer, Giné and Schmalz (2016); Azar, Raina, and Schmalz (2016).

<sup>23</sup> A number of papers have challenged the methodology and data collection in the Airline Paper. See Dennis, Gerardi and Schenone (2017); O'Brien, Kennedy, Song and Waehrer (2017); O'Brien and Waehrer (2017); Rock and Rubinfeld (2017). See Kwon (2017) finding, in contrast to Anton et al. Executive Compensation Paper, that common ownership increases the incentives to compete by sensitising executives to their performance relative to rivals. See Gramlich and Grundl (2017), finding that the results of the Banking Paper were not robust, and that statistical evidence of common ownership impacting competition is mixed.

capital markets. Between the relative size and the lower turnover ratios of these funds, active funds continue to dominate the trading of individual stocks. In the event that index funds become a more significant factor in price discovery of stocks, opportunities to find value will likely favour active funds, resulting in a new equilibrium of active versus index management.

As the stewardship initiatives demonstrate, index managers are expected to be active in shareholder engagement. The large number of investment

stewardship initiatives globally suggests that policymakers and end investors perceive this to be in the public good. The time has come for a new model of shareholder engagement – one that strengthens and deepens communication between shareholders and the companies that they own. Engagement on ESG issues by index fund managers is one way to move the needle on these important issues facing society. As the academic debate around index investing unfolds, it is important to factor in the clear benefits index funds provide to investors, to companies, and to society.

## References

- Antón (M.), Ederer (F.), Giné (M.) and Schmalz (M. C.) (2016)  
“Common ownership, competition, and top management incentives”, November (Anton et al. Executive Compensation Paper): [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2802332](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2802332)
- Azar (J.), Raina (S.) and Schmalz (M. C.) (2016)  
“Ultimate ownership and bank competition”, July (Banking Paper): [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2710252](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2710252)
- Azar (J.), Schmalz (M. C.) and Tecu (I.) (2017)  
“Anti-competitive effects of common ownership”, March (Airline Paper): [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2427345](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2427345)
- BlackRock (2015)  
“US equity market structure: lessons from August 24”, *ViewPoint*, October.
- BlackRock (2017)  
“Index investing supports vibrant capital markets”, *ViewPoint*, October.
- Dennis (P. J.), Gerardi (K.) and Schenone (C.) (2017)  
“Common ownership does not have anti-competitive effects in the airline industry”, November: [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3063465](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3063465)
- Eumedion (2011)  
*Best practices for engaged share-ownership intended for Eumedion participants*, June: [https://eumedion.nl/en/public/knowledgenetwork/best-practices/best\\_practices-engaged-share-ownership.pdf](https://eumedion.nl/en/public/knowledgenetwork/best-practices/best_practices-engaged-share-ownership.pdf)
- Financial Reporting Council (2012)  
*The UK Stewardship Code*, September: <https://www.frc.org.uk/Our-Work/Publications/Corporate-Governance/UK-Stewardship-Code-September-2012.pdf>
- Goh (J.) (2018)  
“MiFID II to boost Europe’s passive funds over active funds”, *International Adviser*, 2 January: <https://international-adviser.com/mifid-ii-boost-europes-passive-funds-active-funds/>
- Gramlich (J.) and Grundl (S.) (2017)  
“Testing for competitive effects of common ownership”, February: <https://www.federalreserve.gov/econres/feds/files/2017029pap.pdf>
- International Corporate Governance Network (2014)  
*Principles for Responsible Institutional Investors – Japan’s Stewardship Code*, 26 February: <https://www.icgn.org/sites/default/files/Japan%20Code.pdf>
- International Monetary Fund – IMF (2015)  
*Global Financial Stability Report: navigating monetary policy challenges and managing risks*, April, pp. 94: <http://www.imf.org/External/Pubs/FT/GFSR/2015/01/pdf/text.pdf>
- Kwon (H. J.) (2017)  
“Executive compensation under common ownership” January: <http://fmaconferences.org/Boston/ExecutiveCompensationunderCommonOwnership.pdf>
- Levine et al. (2014)  
“Ethnic diversity deflates price bubbles”, *Proceedings of the National Academy of Sciences of the United States of America*.
- Levine (S.) and Zajac (E.) (2007)  
“The institutional nature of price bubbles”, February: [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=960178](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=960178)
- Mackintosh (P.) (2017)  
“5 reasons ETFs impact stocks less than you think”, *Market Commentary: ETF Insights*, Virtu Financial (formerly known as KCG), 8 February: <https://ptportal.keg.com/kresearch/do/research/getDownload?attachmentId=4728&username=8FEW5ecT13JTdHAY7QmOTA>

Mallow (M. J.) and Sethi (J.) (2016)

“Engagement: the missing middle approach in the Bebchuck-Strine debate”, *Journal of Law & Business*, Vol. 12, No. 2, New York University, pp. 385-406.

McKinsey & Company (2013)

*Strong performance but health still fragile: global asset management in 2013. Will the goose keep laying golden eggs?*, July.

O’Brien (D. P.), Kennedy (P.), Song (M.) and Waehrer (K.) (2017)

“The competitive effects of common ownership: economic foundations and empirical evidence”, July (O’Brien et al. Paper): [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3008331](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3008331)

O’Brien (D. P.) and Waehrer (K.) (2017)

“The competitive effects of common ownership: we know less than we think”, February (O’Brien and Waehrer Paper): [https://papers.ssrn.com/sol3/papers2.cfm?abstract\\_id=2922677](https://papers.ssrn.com/sol3/papers2.cfm?abstract_id=2922677)

Organisation for Economic Co-operation and Development – OECD (2017)

*Responsible business conduct for institutional investors: key considerations for due diligence under the OECD guidelines for multinational enterprises*: <https://mneguidelines.oecd.org/RBC-for-Institutional-Investors.pdf>

Rock (E. B.) and Rubinfeld (D. L.) (2017)

“Defusing the antitrust threat to institutional investor involvement in corporate governance”, March (Rock and Rubinfeld Paper): [https://papers.ssrn.com/sol3/papers2.cfm?abstract\\_id=2925855](https://papers.ssrn.com/sol3/papers2.cfm?abstract_id=2925855)

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

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*Ireland is a significant host location for the international intermediation of market-based finance, especially through investment funds and special purpose entities. From an Irish perspective, this intermediation essentially matches foreign assets and foreign liabilities, with few linkages to the domestic financial system. Still, although the ultimate risks lie elsewhere, the Central Bank of Ireland monitors the sector in view of its role in the financial systems of the euro area and the global economy. Much has been achieved in recent years to increase transparency and quantify risk but serious measurement challenges remain at a global level.*

**M**arket-based finance refers to the raising of equity or debt through the financial markets rather than through the banking system. This sector has grown in size and geographical footprint, especially since the financial crisis of 2008 (Baranova et al., 2017, FSB 2017). Ireland is a significant host for market-based financial entities, especially investment funds and special purpose entities. Although domiciled in Ireland, these products are part of a wider international chain of financial intermediation. In general, the ultimate risk holder is not based in Ireland and there are few linkages to the domestic Irish economy (Golden et al., 2015). Still, as prudential and conduct regulator, the Central Bank of Ireland must ensure that Irish-domiciled entities comply with the relevant domestic and European regulation.

During the global financial crisis, it became clear that the activities of market-based financial entities could have systemic effects. For example, liquidity risk in money market funds was shown to amplify the crisis by reducing access to funding for banks. Contagion and amplification effects also occurred as money market funds (MMFs) received support from sponsor asset-management companies, sponsor banks and in the United States the public sector (Ansidei et al., 2012, Bengtsson, 2013). In response, the regulatory powers of European national regulators have been expanded to take into account the systemic risks of funds. For example, a national regulator can cap the leverage of an alternative investment fund manager in order to limit its contribution to systemic risk.<sup>1</sup>

In analysing market-based finance, the Central Bank of Ireland has a dual strategy of top-down analysis of the aggregate sector and bottom-up entity-level analysis. This work is regularly published, while we also contribute to the European Systemic Risk Board (ESRB) *EU Shadow Banking Monitor* and the Financial Stability Board (FSB) *Global Shadow Banking Monitoring Report*. In addition, the 2016 International Monetary Fund Financial Sector Assessment Program (IMF FSAP) provided an

important opportunity for an external analysis of the vulnerabilities in the Irish asset management sector.

The remainder of the paper is constructed as follows. Section 1 quantifies the size of the Irish market-based finance sector. Section 2 explains the factors contributing to Ireland's role as a host for financial intermediation, outlines some stress testing techniques for investment funds and money market funds and highlights current measurement challenges and improvements in this sector. Section 3 concludes.

### 11 Quantifying Irish market-based finance

In this section, we quantify the size of the Irish market-based finance sector and illustrate its importance in a European and global context. Within market-based finance, the Central Bank of Ireland collects granular data on investment funds (IFs), money market funds (MMFs) and special purpose entities (SPEs). The SPE category is further sub-divided into securitisation vehicles (known as financial vehicle corporations or FVCs) and non-securitisation special purpose vehicles (SPVs). We do not have granular balance sheet data on other financial entities that are active participants in market-based finance, such as holding companies, treasury companies and financial auxiliaries, since these do not fall under any relevant current European or domestic legislation relating to balance sheet reporting. Holding companies and treasury companies may be active in the markets but are likely to be acting on behalf of their corporate group, rather than intermediating on behalf of a client. Financial auxiliaries may be providing advisory services rather than directly raising finance. Still, the Central Bank of Ireland plans to continue to improve granular coverage of the sector over time.

Looking at funds and SPEs, the total assets of the sector stood at EUR 3.2 trillion at the end of 2016. IFs and MMFs comprised 76% of the

<sup>1</sup> This is allowed under article 25 of AIFMD (Alternative Investment Fund Managers Directive 2011).

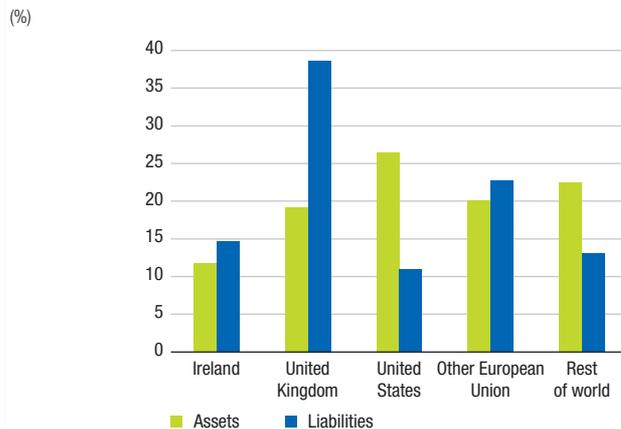
total, with the remaining 24% attributable to FVCs and SPVs (Central Bank of Ireland, 2017a). As a host country, Ireland represents 17% of IF assets, 41% of MMF assets, and 22% of FVC assets in the euro area as at the end of 2016 (Central Bank of Ireland, 2017a).

According to the IMF FSAP (2016), Ireland represents 10.3% of global MMF assets. Recent FSB analysis (2017) notes that the MMF sector is dominated by four jurisdictions (the United States, China, Ireland, and France), which together accounted for about 90% of total MMF assets under management. These statistics show that Ireland is an important international host for market-based finance, both in the European and the global context.

These entities hold assets and liabilities that are located mainly outside of Ireland. In Chart 1, we show information on the geographical location of the balance sheets of Irish-domiciled funds and SPEs (Central Bank of Ireland, 2017a). Looking first at the financing of these entities, we see that liabilities are primarily *vis-à-vis* the United Kingdom, with Other EU being the second largest source of funding. We note that assets are more widely spread out, with the United States being the largest destination. An important caveat to Chart 1 is that the assets and liabilities are reported on a first counterparty basis. This means that the data report the proximate sources and destinations rather than the location of the ultimate beneficial owner or the final investment destination. Still, the main message is that funding shocks in source markets and valuation shocks in destination markets would have a material impact on the dynamics of the market-based financial products and financial entities hosted in Ireland.

The international/global nature of the intermediation hosted by Ireland is also illustrated by the currency composition of Irish-domiciled money market funds. As at October 2017, EUR 203 billion out of the EUR 489 billion in total assets were denominated in sterling and EUR 213 billion

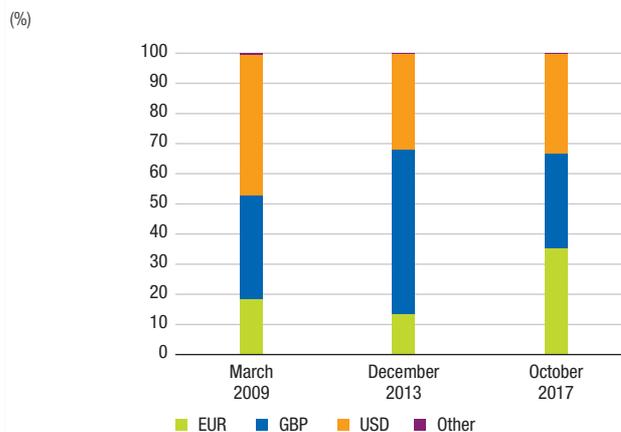
C1 Balance sheet exposure of funds and special purpose entities by location



Source: Central Bank of Ireland. Notes: Data as of Q2 2017. Figures are based on aggregate total assets and liabilities for IFs, MMFs, FVCs, and SPVs.

were denominated in US dollars (Central Bank of Ireland, 2017b). Chart 2 presents the percentage split in the currency breakdown in money market funds assets since March 2009.

C2 Currency breakdown of market money fund's assets



Source: Central Bank of Ireland. Note: Data between March 2009 and October 2017.

## 2I Ireland’s role within international financial intermediation

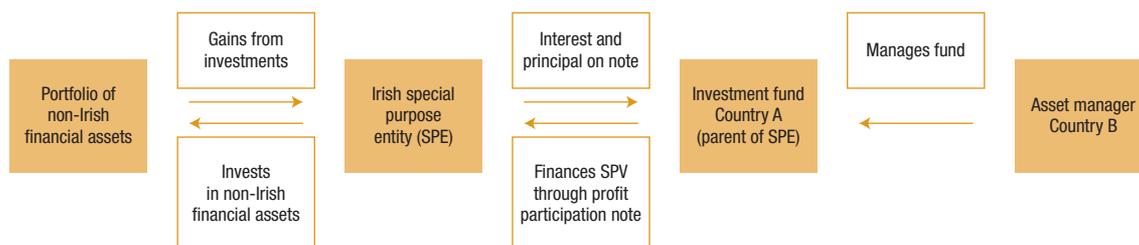
Irish-domiciled entities typically act as intermediaries within the global financial system. These entities can be part of a chain of financial intermediaries spanning the globe. Many banks and investment firms choose to set up funds, SPEs, treasury companies and holding companies in Ireland for an array of financial and non-financial reasons. These include Ireland’s membership of the EU and the OECD, in contrast to the status of some other prominent international financial centres. Since Irish law is a common law system, this appeals particularly to UK or US parents/originators, or those wishing to interact with these financial systems. Ireland has a long-established international financial centre with many experienced service providers. The longevity and certainty of the relevant Irish tax regimes are also important factors. For example, the investment funds tax regime has been in place for over 25 years (Irish Funds, 2017). The Section 110 taxation regime, which relates to SPEs, has been in place since 1997. Unlike some other countries, Irish tax regimes are based on regulation and not on rulings, giving certainty to the regime. Generally, non-Irish investors are exempt from withholding tax on their investments as Ireland has a wide and expanding double taxation treaty network.

As a result of these factors, the legal entity may be domiciled in Ireland and the administration may take place in Ireland. Much of the investment and finance decision-making originates elsewhere (subject to compliance with the relevant legislation). For example, over 95% of Irish-domiciled fixed-income fund managers are not based in Ireland. Recent analyses by the Central Bank of Ireland present case studies of SPEs that highlight these international linkages (Barrett et al., 2016, Godfrey et al., 2015).

Chart 3 illustrates a stylised example of this interconnectedness. In this example, the SPV is part of an international chain of entities that aim to invest in a portfolio of non-Irish financial assets in a tax-efficient manner. From a financial stability perspective, it is clear that the risk is elsewhere, although the SPV is domiciled in Ireland. This is a stylised example but the conclusion that the risk is elsewhere is commonly found in this sector.

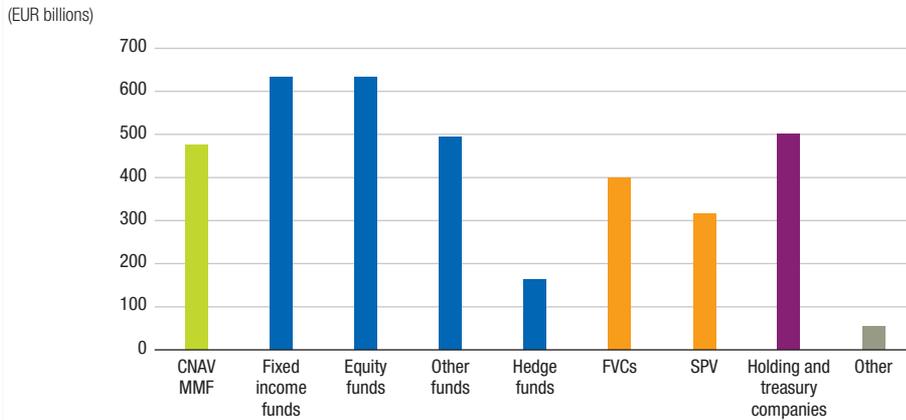
Turning to the size of the sector, the Central Bank of Ireland has access to both aggregate and entity level data. From an aggregate perspective, the Statistics division in the Central Bank of Ireland works with the Central Statistics Office (CSO) to develop the flow of funds data. As defined by Boidard and Majoor (2017), the market-based

C3 Irish special purpose vehicle (SPV) linked to an investment fund and an asset manager in two overseas locations



Source: Central Bank of Ireland.

C4 Size of Irish other financial institutions and money market fund sector



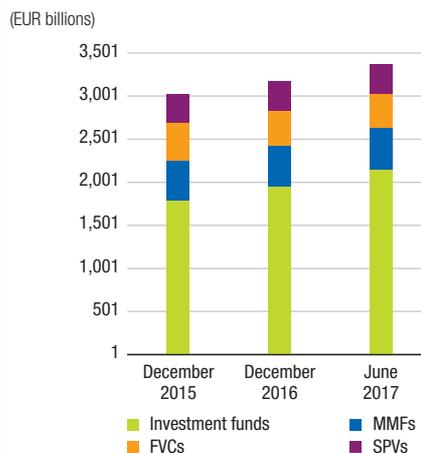
Source: Central Bank of Ireland data as at December 2016.  
 Note: CNAV refers to constant net asset value money market funds. Other funds is a residual category in the investment funds sector, whereas other here refers to the collection of smaller in size categories of entities, including financial auxiliaries, stockbrokers, VNAV (variable net asset value) MMF and REITS (real estate investment trusts). The stockbroker figure is based on the financial statements of the firms and excludes clients' assets. Holding and treasury companies data is an aggregate estimate based on annual financial account total asset data.

finance sector is categorised as the other financial institutions (OFI) sector plus money market funds (which are included in banking statistics). The OFI sector is equal to the financial system excluding banks, government, pension funds and insurance companies (FSB, 2017). The sub-categories and asset valuations in the OFI sector are presented in Chart 4 along with money market funds. Overall, the Central Bank of Ireland has granular balance sheet data on approximately 85% of the sector. By international standards, this is very high, as noted recently by Adrian (2017). For example, within the euro zone the average granular coverage is approximately 50% (ESRB, 2017, p.14).

Chart 5 compares the four main sectors (that is money market funds, investment funds, FVCs and SPVs) over time. Since December 2015, the assets of FVCs have declined whereas the other three categories have all grown in size. The strongest expansion has been in the investment fund sector, which has grown by 27% in the period. This growth in investment fund assets is due to a mix of rising market valuations and persistent

inflows (Central Bank of Ireland, 2017a). Similar growth in investment funds has been seen on a global basis (FSB, 2017).

C5 Size of Irish funds and special purpose entities over time



Source: Central Bank of Ireland.  
 Notes: Monthly data between Q3 2015 and Q2 2017. Other SPV reporting started in Q3 2015.

### 211 Funds

As mentioned above, MMFs were shown to be systemically important during the crisis (Ansidei et al., 2012). This is particularly true for constant net asset value (CNAV) prime funds that primarily invest in corporate debt securities. The recent FSAP (IMF, 2016) noted that 8 out of the top 10 Irish domiciled MMFs are prime funds.

In response to the financial crisis, new European legislation on money market funds will come into effect in July 2018. This legislation restricts the use of CNAV funds to those investing in public debt instruments or cash. This may lead to a shift from prime CNAV funds to government CNAV funds or prime variable net asset value (VNAV) funds, as has been seen in the United States following similar legislation (Adrian, 2017). Existing funds have eighteen months to comply and the Central Bank of Ireland will monitor their response and any potential impact on the corporate bond market.

As part of our role as financial regulator and to inform the financial stability policy agenda, the Central Bank of Ireland has reviewed the stress testing methods of the funds sector (investment funds and money market funds). Daly and Moloney (2017) find a wide array of models and techniques being applied by managers when stress testing funds. As redemption requests and asset values vary over time, managers focus on monitoring liquidity and market risk.

Metadger and Moloney (2017) apply a bank-like stress test based on the high quality liquid asset (HQLA) approach to a range of categories of funds. The main finding of this study is that the HQLA-inspired approach is more appropriate for MMFs and sovereign bond funds that invest primarily in advanced economies, but less appropriate for more complex funds, such as those who primarily invest in emerging markets or high yield assets. For these funds, alternative tests may be more appropriate, such as those that define liquidity based on market

measures (such as the bid-ask spread) rather than credit ratings. The inclusion of second round effects, the analysis of daily redemption flows and the implications of leverage on stress are further areas of future focus. We will also monitor the implementation and effectiveness of the stress testing techniques outlined in the new MMF regulation.

As mentioned briefly above, intervention powers have increased for financial regulators and central banks since the crisis. The ESRB (2016, 2017) is currently reviewing the potential for macroprudential policy tools for this sector. The European Securities and Markets Authority (ESMA) is engaging in this process and focusing on enhanced supervisory convergence across national competent authorities (Boidard and Maijor, 2017). The Financial Stability Board (2017) is monitoring the trends and risks in the sector and making recommendations to improve resilience. Ireland is participating in these initiatives and undertaking its own analysis.

### 212 Special purpose entities (SPEs)

The SPE sector is challenging to define since it contains many business models ranging from securitisation to aircraft leasing to loan origination. A number of initiatives are currently underway to define the perimeter of SPE activities, including work at the European Central Bank (ECB) and the Organisation for Economic Co-operation and Development (OECD). Some of the entities in this sector raise funds privately and as such do not technically come under market-based finance. But, for ease, we include all in our SPE database in the current analysis. Following an ECB regulation, the Central Bank of Ireland began collecting granular balance sheet data on financial vehicle corporations (FVCs) in 2009. Furthermore, following a review of SPE activity in Ireland, we increased the monitoring perimeter to include SPVs in Q3 2015 (Godfrey et al., 2015). These data have increased our monitoring of interconnectedness.

The Central Bank of Ireland recognises the potential risk from this sector. As noted by Adrian and Ashcraft (2012), banks may choose to set up SPEs to take advantage of capital or other regulatory arbitrage. They argue that the gap between capital and liquidity requirements on traditional institutions and non-regulated institutions creates an incentive for channelling credit intermediation through the non-bank sector.

Acting alone, this arbitrage is difficult for Irish analysts to ascertain, as it requires significant understanding of the activities of the overseas originator/sponsor. In addition, even if arbitrage mechanisms are identified, the Central Bank may have no regulatory powers to alter the arrangements, since the domestic entities are currently not subject to prudential regulation. However, these entities are subject to the European Market Infrastructure Regulation (EMIR) for derivatives transactions and the Prospectus Directive (PD) if issuing debt publicly.<sup>2</sup>

Despite these regulatory limitations, the Central Bank recognises the potential threat to international financial stability and has actively engaged in information sharing, monitoring and analysis with international agencies and other regulators. We also initiate internal and externally published research in this area. For example, Kenny et al. (2016) highlight the interconnectedness between Irish SPEs and some non-domestic banks in the credit default swap market. Coates et al. (2017a) examine the aircraft leasing industry, using the SPV reported data and developing a new database to cover entities that do not fall under this reporting requirement. They note the size of the sector can have implications for Ireland's national accounts and balance of payments. Finally, Golden and Maqui (2017) review debt issuance by international banks in the context of the Irish SPE sector, analysing the impact of factors such as capitalisation, size, profitability, funding constraints and loan portfolio risk at the bank level and capital flow management

policies, prudential regulation and taxation at the country level.

Global measurement issues act as a constraint. As mentioned above, assets and liabilities are reported on a first counterparty basis rather than reporting the underlying investor or final receiver of the funds. This issue may be somewhat resolved by the analysis of a new database, the Securities Holdings Database. This database is maintained by the Central Bank of Ireland and other Eurosystem central banks as part of the ECB initiative to develop a database on the securities holdings of selected euro area investors. Analysis by Coates et al. (2017b) supports the conclusion above that most of the holdings of Irish market-based finance entities are non-Irish (see Chart 1). Further application of the database will help to clarify the underlying interconnectedness of the Eurosystem sector.

Another limitation of the data, as highlighted by the IMF in the FSAP (2016), is that cross holdings by funds and entities exaggerate the true Irish exposure. Many entities are part of umbrella groups and funds flow from one to another before leaving Irish shores. Based on limited data, the main connections to the Irish economy appear to be securitisations by Irish banks, investments in Irish property (either directly or through mortgage-backed securities) and financing operations by non-financial corporations (Central Bank of Ireland, 2017a).

In general, the balance sheet data we collect do not flag if the Irish entities are consolidated onto the balance sheet of a supervised entity in another jurisdiction. Consolidated entities may be subject to prudential supervision overseas. This is a further layer of cross-border interconnectedness, which requires extensive international cooperation to confirm.

New data such as those generated by EMIR promise much in terms of analytical potential but

<sup>2</sup> The regulatory role of the Central Bank of Ireland with respect to the PD is to ensure that all required information is available in the prospectus, not to ensure the veracity of that information (Central Bank of Ireland, 2017c).

there are many practical challenges in ensuring high-quality data, such as missing fields and misreported fields (Kenny et al., 2016). Still, initial application of the EMIR data has usefully enabled the review of synthetic leverage in Irish entities. The Central Bank is an active member of the many international working groups that seek to reduce measurement constraints and data gaps in this sector.<sup>3</sup>

Additionally, the Statistics and Supervisory divisions of the Central Bank of Ireland are increasing the granularity and scope of micro-level data analysis. We are also procuring commercial databases to facilitate data quality assurance and empirical analysis for supervisory and policymaking purposes. This work is ongoing and there is much to be done to improve our understanding of the activities, motives and risks in this diverse sector.

<sup>3</sup> For example, with the ECB, ESRB, ESMA, the EBA, OECD, IOSCO and FSB.

### 31 Conclusion

Ireland is an important host country within the global financial intermediation sector, with a particular focus on investment funds, money market funds and special purpose entities. Most of the assets and liabilities of the Irish-domiciled entities are external and the risks lie elsewhere. Nevertheless, the Central Bank of Ireland monitors and analyses these risks as part of our mandate to support international financial stability.

Since the crisis, new regulation and increased monitoring has significantly improved our understanding of the sector. We now have granular data on 85% of the OFI sector, far higher than the euro average of 50%. But measurement issues still constrain our understanding, such that international initiatives to close data gaps remain a high priority.

## References

Adrian (T.) (2017)

“Shadow banking and market-based finance”, International Monetary Fund speech at the 33rd SUERF Colloquium & Bank of Finland Conference, Helsinki, 14 September: <https://www.imf.org/en/News/Articles/2017/09/13/sp091417-shadow-banking-and-market-based-finance>

Adrian (T.) and Ashcraft (A. B.) (2012)

“Shadow banking regulation”, *Federal Reserve Bank of New York Staff Reports*, 559, April: [https://www.newyorkfed.org/medialibrary/media/research/staff\\_reports/sr559.pdf](https://www.newyorkfed.org/medialibrary/media/research/staff_reports/sr559.pdf)

Ansidei (J.), Bengtsson (E.), Frisson (D.) and Ward (G.) (2012)

“Money market funds in Europe and financial stability”, *European Systemic Risk Board Occasional Paper Series*, No. 1: [https://www.esrb.europa.eu/pub/pdf/occasional/20120622\\_occasional\\_paper\\_1.pdf?165c0fd2796ab2ee5505cc9d342cc30b](https://www.esrb.europa.eu/pub/pdf/occasional/20120622_occasional_paper_1.pdf?165c0fd2796ab2ee5505cc9d342cc30b)

Baranova (Y.), Coen (J.), Lowe (P.), Noss (J.) and Silvestri (L.) (2017)

“Simulating stress across the financial system: resilience of corporate bond markets and the role of investment funds”, *Bank of England Financial Stability Paper*, No. 42, July: <https://www.bankofengland.co.uk/financial-stability-paper/2017/simulating-stress-across-the-financial-system-resilience-of-corporate-bond-markets>

Barrett (D.), Godfrey (B.) and Golden (B.) (2016)

“New data collection on special purpose vehicles in Ireland: initial findings and measuring shadow banking”, *Central Bank of Ireland Quarterly Bulletin*, 4, October, pp. 71-84: <https://www.centralbank.ie/docs/default-source/publications/quarterly-bulletins/QB4-16/gns-5-1-15-new-data-collection-on-special-purpose-vehicles.pdf?sfvrsn=2>

Bengtsson (E.) (2013)

“Shadow banking and financial stability: European money market funds in the global financial crisis”, *Journal of International Money and Finance*, Vol. 32: [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1772746](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1772746)

Central Bank of Ireland (2017a)

“4.3: Funds and vehicles sector”, *Macro Financial Review*, 2017: I, pp. 55-57: <https://www.centralbank.ie/docs/default-source/publications/macro-financial-review/macro-financial-review-2017-1.pdf>

Central Bank of Ireland (2017b)

“Money Market Fund Statistics – Q2 2017”, *Statistical Release*, September: <https://centralbank.ie/docs/default-source/statistics/data-and-analysis/other-financial-sector-statistics/money-market-funds/2017q2-ie-money-market-fund-information-release.pdf?sfvrsn=8>

Central Bank of Ireland (2017c)

“What is a securities prospectus and what can I learn from it?”, *Central Bank of Ireland Consumer Hub*: <https://www.centralbank.ie/consumer-hub/explainers/what-is-a-securities-prospectus-and-what-can-i-learn-from-it>

Coates (D.), Osbourne-Kinch (J.) and Nolan (L.) (2017a)

“The aircraft leasing industry in Ireland: cross border flows and statistical treatment”, *Central Bank of Ireland Quarterly Bulletin*, 1, January, pp. 58-69: <https://www.centralbank.ie/docs/default-source/publications/quarterly-bulletins/quarterly-bulletin-signed-articles/the-aircraft-leasing-industry-in-ireland.pdf?sfvrsn=6>

Coates (D.), Osbourne-Kinch (J.) and Power (B.) (2017b)

“Securities holdings statistics in Ireland: introducing the enhanced quarterly statistics”, *Central Bank of Ireland Quarterly Bulletin*, 1, January, pp. 70-86: <https://www.centralbank.ie/docs/default-source/publications/quarterly-bulletins/quarterly-bulletin-signed-articles/securities-holdings-statistics-in-ireland.pdf?sfvrsn=4>

Daly (P.) and Moloney (K.) (2017)

“Liquidity & risk management: results of a survey of large Irish-domiciled funds”, *Central Bank of Ireland Quarterly Bulletin*, 3, July, pp. 48-62: <https://centralbank.ie/docs/default-source/publications/quarterly-bulletins/qb-archive/2017/quarterly-bulletin---q3-2017.pdf?sfvrsn=10.pdf#page=50>

### European Systemic Risk Board – ESRB (2016)

“Macroprudential policy beyond banking: an ESRB strategy paper”, July: [https://www.esrb.europa.eu/pub/pdf/reports/20160718\\_strategy\\_paper\\_beyond\\_banking.en.pdf](https://www.esrb.europa.eu/pub/pdf/reports/20160718_strategy_paper_beyond_banking.en.pdf)

### ESRB (2017)

*EU Shadow Banking Monitor*, No. 2, May: [https://www.esrb.europa.eu/pub/pdf/reports/20170529\\_shadow\\_banking\\_report.en.pdf](https://www.esrb.europa.eu/pub/pdf/reports/20170529_shadow_banking_report.en.pdf)

### European Union (2011)

“Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010”, *Official Journal of the European Union*: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2011:174:0001:0073:EN:PDF>

### Financial Stability Board (2017)

*Global Shadow Banking Monitoring Report 2016*, May: <http://www.fsb.org/wp-content/uploads/global-shadow-banking-monitoring-report-2016.pdf>

### Godfrey (B.), Killeen (B.) and Moloney (K.) (2015)

“Data gaps and shadow banking: profiling special purpose vehicles’ activities in Ireland”, *Central Bank of Ireland Quarterly Bulletin*, July, pp. 48-60: <https://www.centralbank.ie/docs/default-source/publications/quarterly-bulletins/quarterly-bulletin-signed-articles/data-gaps-and-shadow-banking.pdf?sfvrsn=6>

### Golden (B.), Godfrey (B.), Moloney (K.), Murphy (C.) and O’Reilly (E.) (2015)

“The non-bank financial sector in Ireland”, *Global Shadow Banking Monitoring Report*, appendix 2, pp. 48-52: <http://www.fsb.org/wp-content/uploads/global-shadow-banking-monitoring-report-2015.pdf>

### Golden (B.) and Maqui (E.) (2017)

“What ‘special purposes’ explain cross-border debt funding by banks? Evidence from Ireland”, *Manuscript in preparation*.

### International Monetary Fund (2016)

“Ireland: Financial Sector Assessment Program: technical note-asset management and financial stability”, September: <https://www.imf.org/en/Publications/CR/Issues/2016/12/31/Ireland-Financial-Sector-Assessment-Program-Technical-Note-Asset-Management-and-Financial-44305>

### Irish Funds (2017)

“Getting started in Ireland, taxation”: <https://www.irishfunds.ie/getting-started-in-ireland/taxation>

### Kenny (O.), Killeen (N.) and Moloney (K.) (2016)

“Network analysis using EMIR credit default swap data: micro-level evidence from Irish-domiciled special purpose vehicles (SPVs)”, *IFC Bulletins*, chapters in: Bank for International Settlements (ed.), *Combining micro and macro data for financial stability analysis*, Vol. 41, from Bank for International Settlements: <https://www.bis.org/ifc/publ/ifcb41r.pdf>

### Majoor (S.) and Boidard (C.) (2017)

“A stability perspective of market-based finance: designing new prudential tools?”, *Financial Stability Review*, Banque de France, 21 April, pp. 149-156: [https://publications.banque-france.fr/sites/default/files/medias/documents/fsr21\\_web.pdf](https://publications.banque-france.fr/sites/default/files/medias/documents/fsr21_web.pdf)

### Metadjer (N.) and Moloney (K.) (2017)

“Liquidity analysis of bond and money market funds”, Central Bank of Ireland, *Economic Letters Series*, No. 10: [https://www.centralbank.ie/docs/default-source/publications/economic-letters/vol-2017-no-10--liquidity-analysis-on-bond-and-money-market-funds-\(metadjer-and-moloney\).pdf?sfvrsn=2](https://www.centralbank.ie/docs/default-source/publications/economic-letters/vol-2017-no-10--liquidity-analysis-on-bond-and-money-market-funds-(metadjer-and-moloney).pdf?sfvrsn=2)

### O’Grady (M.), Rice (J.) and Walsh (G.) (2017)

“Global and domestic modeling of macroeconomic shocks: a GVAR analysis of Ireland”, Central Bank of Ireland, *Research Technical Paper*, 09/17: <https://www.centralbank.ie/news-media/press-releases/research-technical-paper-global-and-domestic-modeling-of-macroeconomic-shocks---a-gvar-analysis-of-ireland>

## Collateral damage

*A financial crisis is an event in which the holders of short-term debt come to question the collateral backing that debt. So, the resiliency of the financial system depends on the quality of that collateral. The authors show that there is a shortage of high-quality collateral by examining the convenience yield on short-term debt, which summarises the supply and demand for short-term safe debt, taking into account the availability of high-quality collateral. They then show how the private sector has responded by issuing more (unsecured) commercial paper at shorter maturities. The results suggest that there is a shortage of safe debt now compared to the pre-crisis period, implying that the seeds for a new shadow banking system to grow exist.*

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In a classic banking panic, holders of demand deposits want their cash back because they do not trust the value of the banks' loan portfolios backing the deposits. Deposit insurance solves this problem. In the crisis of 2007-08 the holders of short-term debt, in the form of repos, came to distrust the bonds used as collateral and increased haircuts, generating a run on the banking system.<sup>1</sup> Have the many post-crisis legal and regulatory changes to banking systems mitigated this problem? Or, have these changes exacerbated the shortage of good collateral, resulting in collateral damage? To the extent new laws and regulations constrain private short-term debt issuance, they also create an incentive to find new ways to produce private debt – a new shadow banking system. We seek to study this incentive for private safe debt production by looking at the relative change in the convenience yield on short-term debt, and the private sector response to increases in the convenience yield.

Short-term money-like debt is always backed by long-term debt as collateral.<sup>2</sup> So, we can summarise the state of supply and demand of long-term debt collateral indirectly by looking at the convenience yield on short-term debt. The convenience yield summarises the outcome of the plethora of legal and regulatory changes post-crisis. Our results show that measures of the convenience yield have not returned to pre-crisis levels. Further, we find that the quantity and maturity of private issuance of short-term debt claims is sensitive to high-frequency changes in Treasury supply, more so than in the pre-crisis period. Overall, the results suggest a shortage of high-quality collateral.

In the last 40 years the financial system permanently changed from a system that mostly produced retail (insured) demand deposits to a system that produces significant amounts of short-term (uninsured) debt for the wholesale market. This new system produces short-term debt to a large extent with backing collateral produced from the very loans that the traditional banking system originates,

a process called securitisation. The transformation of the financial system is dramatic. Using US Flow of Funds (now called the Financial accounts of the US) data, Gorton et al. (2012) analyse the transformation of the US banking system over the period Q1 1952 through Q1 2009. As a percentage of the total amount of privately produced safe debt, demand deposits fell from about 80% to 31%. Money-like debt (e.g. repos, commercial paper, money market funds) rose from 11% to 21%. Aaa asset-backed and mortgage-backed securities (ABS and MBS) rose from zero to 18%. The shadow banking system is the sum of the ABS/MBS and money-like debt components, which increased from 11% to 38%, overtaking demand deposits in total value. This transformation seems to have accelerated in the late 1980s, and it is apparent that the change is not temporary.

Has the shadow banking system become safer post-crisis? It is hard to answer this question because there have been so many changes since the financial crisis, including the introduction of many new bank regulations and capital requirements. Also, since the crisis, the production of privately-produced collateral in the form of Aaa securitisation tranches has declined. The sovereign debt of some countries is no longer considered safe.<sup>3</sup> There was a large amount of net government debt issuance during the crisis, but central bank quantitative easing programmes absorbed considerable amounts of government debt and other high quality collateral. And recent bank regulations, for example the liquidity coverage ratio, have aimed at tying up high quality collateral, making it immobile.<sup>4</sup> What has been the net effect of all these changes? Answering this question is essential for understanding the post-crisis financial system. We argue that the convenience yield can serve as a valuable statistic summarising the effects of these changes. A high convenience yield corresponds to a relative scarcity of short-term safe debt, suggesting an insufficient amount of collateral to back short-term debt.

Dang et al. (2012) argue that information-insensitivity is the defining feature of “safe” debt. Maximal

<sup>1</sup> See Gorton and Metrick (2012); Gorton et al. (2017).

<sup>2</sup> See Dang et al. (2012).

<sup>3</sup> On the global reduction in safe assets since the crisis see Barclays Capital (2012).

<sup>4</sup> See Gorton and Muir (2016).

information-insensitivity is achieved by debt-on-debt, debt backed by debt. If there is a shortage of collateral to back the debt, the private sector can respond by issuing unsecured short-term debt (backed by a portfolio of debt, bonds or loans), attempting to make it information-insensitive by shortening maturities. With an insufficient amount of bonds to back repos, the private sector will produce short-term debt elsewhere. We show a correlation between the issuance of (unsecured) commercial paper and heightened convenience yields and that the maturity of the commercial paper has shortened. This has persisted since the crisis.

In Section 1 we examine the levels of various measures of the convenience yield, comparing the current levels to pre-crisis values. In Section 2 we look at the sensitivity of the convenience yield to exogenous (but anticipated) shocks to the amount of outstanding US Treasury bills. In Section 3 we examine how the sensitivity of issuance and maturity of financial commercial paper have changed compared to the pre-crisis period. Section 4 concludes by briefly discussing what the results mean.

## 11 Levels

We begin by examining changes in the levels of various measures of the convenience yield on long and short-term debt. These measures are the one and three-month spread between the general collateral (GC) repo rate and the US Treasury bill rate, the spread between Aaa corporates and US Treasury bonds, and the spread between Baa and US Treasury bonds. Krishnamurthy and Vissing-Jorgensen (2012), and Krishnamurthy and Vissing-Jorgensen (2015) examine such convenience yield measures and associate them with the outstanding aggregate supply of Treasuries. Another measure of the convenience yield can be constructed by comparing market rates with rates from a fitted yield curve, as in Greenwood et al. (2015). We construct a version of their “z-spread” – the average spread between T-bills with remaining maturities between 4 to 26 weeks

and fitted values from Gürkaynak et al. (2007). We subtract market rates from fitted rates to ensure a positive z-spread, on average. As Chart 1 shows, this measure is strongly correlated with the GC-1 month Treasury spread.

We want to see if these measures of the convenience yields marginally increased during the crisis and again in the post-crisis period, compared to the pre-crisis baseline. To do this we run a simple regression with a constant (the baseline), a dummy variable that is turned to one starting in July 2007 (the start of the crisis) and another dummy that is turned to one from 2012 to the present. The coefficient on the first dummy tells us how the convenience yield level changed during the crisis compared to the baseline. The coefficient on the second dummy tells us how the convenience yield has changed since the crisis. We also report the p-value for the null hypothesis that the crisis and post-crisis dummies sum to zero. If the coefficients sum to zero, then the current period is like the pre-crisis period.

Table 1 shows the results. The first row of the table shows that convenience yields rose during the crisis, consistent with a shortage of safe short-term debt. The second row shows that since then convenience yields have come down.

**T1 Proxies of the convenience yield**

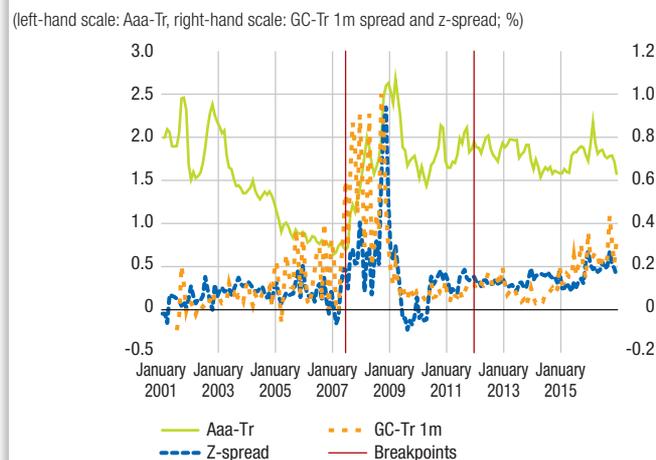
	GC-Tr 1m	GC-Tr 3m	Z-spread	Aaa-Tr	Baa-Tr
I (July 2007-present)	0.135*** (17.13)	0.131*** (19.43)	0.0987*** (20.61)	0.425*** (26.91)	0.885*** (32.39)
I (2012-present)	-0.0958*** (-11.74)	-0.0654*** (-9.15)	-0.0260*** (-5.14)	-0.0204*** (-1.21)	-0.432*** (-14.79)
Constant	0.109*** (21.07)	0.0596*** (13.79)	0.0749*** (24.40)	1.391*** (137.60)	2.348*** (134.30)
p(crisis+post=0)	<0.001	<0.001	<0.001	<0.001	<0.001
Observations	3840	3985	3983	3931	3931
R <sup>2</sup>	0.0728	0.0874	0.108	0.202	0.213

Sources: Bloomberg (general collateral repo rates); authors' calculations (z-spread) following Greenwood et al. (2015); Federal Reserve System, *Federal Reserve Statistical Release H.15* (Aaa and Treasury interest rates).

Note: Daily sample from January 2001 to December 2016.

t statistics in parentheses; \* p<0.10, \*\* p<0.05, \*\*\* p<0.01.

### C1 Proxies of the convenience yield



Sources: Bloomberg (general collateral repo rates); authors' calculations (z-spread) following Greenwood et al. (2015); Federal Reserve System, *Federal Reserve Statistical Release H.15* (Aaa and Treasury interest rates).  
Note: Monthly averages from January 2001 to December 2016. Vertical lines depict the dummy variable cut-off dates.

But, adding these two coefficients shows that overall convenience yields have not returned to pre-crisis levels – the sum of the two dummies is positive in all cases. The p-values show that the hypothesis that the crisis plus post-crisis dummies sum to zero is strongly rejected in all cases.

Chart 1 supra plots three measures of the convenience yield.

## 2I Tax day dynamics

Another way to gauge the scarcity of short-term safe debt is to look at the sensitivity of US Treasury yields and convenience yields to Treasury bill (anticipated) supply shocks. In this section we study the sensitivity of convenience yields to a supply shock which occurs annually around 15 April in the United States, when households and firms pay their taxes. Anticipating an inflow of cash, the Treasury issues fewer Treasury bills. When there is a decline in the outstanding supply of bills, how does the yield on bills and the convenience yield change?

The regressions reported in Table 2 regress changes in yields on contemporaneous supply changes in Treasury bills. We further interact the right-hand-side variables with the two dummy variables – crisis and post-crisis – used in Section 1. We examine daily data in a ten day window around the tax day.

The baseline regression shows that when the supply of Treasuries drops, the yield on the one-month Treasury goes down, corresponding to an increase in the price of bills. The coefficient 0.58 in the first column implies that a 5% drop in T-bill supply corresponds to a 2.9 basis point decrease in the one-month yield. During the crisis, and since 2008, the yields went up more, for a given size of supply shock. Since 2012 there has been a reduction in the sensitivity to supply shocks, but overall the response to the tax-related decrease remains heightened. However, the p-value on the sum of the coefficients cannot reject that the sum is zero.

Table 2 also shows the response of the GC repo-one month Treasury (Tr 1m) bill spread. A negative shock to Treasuries outstanding causes the spread to increase, more so with the onset of the crisis. In the baseline, a 5% drop in T-bill supply corresponds to 3 basis point increase in the GC-Tr 1m spread. Since the crisis the sensitivity to bill supply has decreased and the overall effect is not different from the pre-crisis period at the usual 5% significance level.

Chart 2 displays these results graphically. Here we plot T-bill supply, T-bill rates, and the GC repo-Treasury bill spread (as deviations from their 60-day means) five days before and after the tax day on 15 April. The top panel shows the data for the 2002-17 sample; the bottom panel shows the data for 2009-17. As the outstanding T-bill supply falls, the Treasury yield goes down and the convenience yield rises.

The evidence from studying the tax day dynamics is mixed, but suggestive and consistent with our other evidence.

**T2 Tax day**

	Tr 1m yield			GC-Tr 1m spread		
$\Delta$ Bills supply	0.583** (2.93)	0.368** (2.83)	0.368** (2.82)	-0.612*** (-4.49)	-0.525*** (-4.57)	-0.525*** (-4.56)
$\Delta$ Supply X I (2008-present)		0.817** (2.86)	1.074*** (6.45)		-0.330 (-1.24)	-0.595*** (-4.27)
$\Delta$ Supply X I (2012-present)			-0.903*** (-5.01)			0.930*** (6.60)
p (crisis+post=0)			0.396			0.0594
Year fixed effects	Y	Y	Y	Y	Y	Y
Observations	176	176	176	176	176	176
R <sup>2</sup>	0.871	0.880	0.883	0.904	0.906	0.909

Sources: Authors' calculations, TreasuryDirect auction schedule (bills supply); Federal Reserve System, *Federal Reserve Statistical Release H.15* (interest rates); Bloomberg (general collateral repo rates).

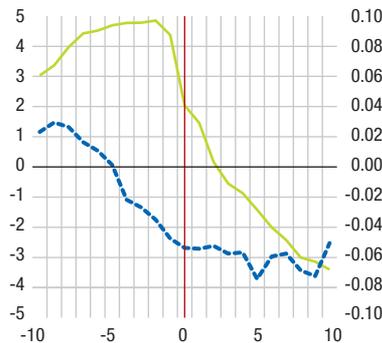
Note: Daily data. Five days before and after tax day. Sample from 2002 to 2017. Standard errors clustered by year. Yearly fixed effects.

t statistics in parentheses; \* p<0.10, \*\* p<0.05, \*\*\* p<0.01.

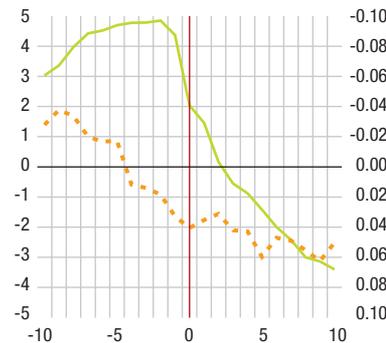
**C2 Treasury bills supply around tax day and treasury yields, general collateral (GC) spread around tax day**

(left-hand scale: supply shock; right-hand scale: yield deviation; right-hand scale inverted for charts b and d; x-axis: trading days from tax day, y-axis: %)

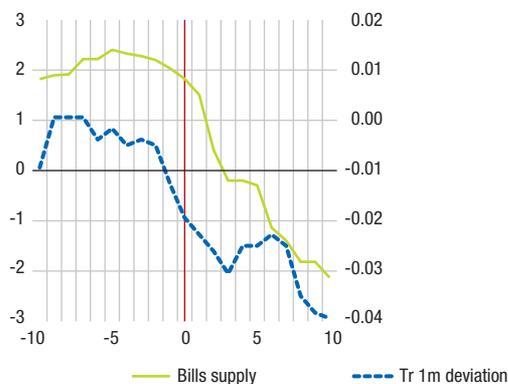
**a) Treasury yields, sample: 2002-2017**



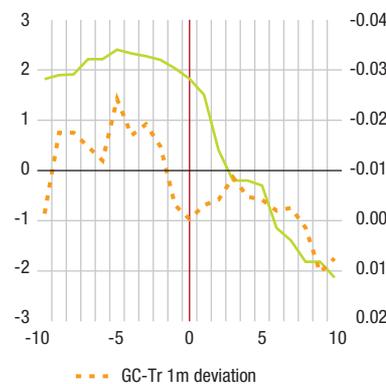
**b) General collateral spread, sample: 2002-2017**



**c) Treasury yields, sample: 2009-2017**



**d) General collateral spread, sample: 2009-2017**



Sources: Authors' calculations (bills supply) from TreasuryDirect auction schedule; Federal Reserve System, *Federal Reserve Statistical Release H.15* (interest rates); Bloomberg (general collateral repo rates).

Note: Supply and yields reported relative to the 60-day mean around tax day. Top row depicts entire 2002-17 sample. Bottom row depicts 2009-17 sample.

### 3I Commercial paper issuance and maturity

Still another way to look at the issue of whether there is a relative scarcity of money-like debt is by examining private sector net issuance of short-term debt in response to changes in Treasury bill supply or the convenience yield, as in Sunderam (2015). Specifically, we study the change in outstanding financial commercial paper as a function of Treasury supply, and as a function of the GC-Treasury one-month spread. Commercial paper issued by financial firms is another kind of short-term debt (though unsecured), with a preponderance of the paper issued at short maturities (in 2017, maturities of 1-4 days made up 58% of issuance). An issuer seeking to issue a maximally information-insensitive asset would tilt towards shorter maturities.

Table 3 shows that reductions in the Treasury bills outstanding, normalised by gross domestic product (GDP), coincide with increases in net (log) issuance of the privately-produced substitutes. In the baseline case, a 1% reduction in bills/GDP

coincides with a 0.33% increase in financial commercial paper outstanding. The interaction terms with dummy variables for crisis and post-crisis periods demonstrate that this sensitivity is mostly on account of the post-crisis period. We strongly reject the null hypothesis that crisis plus post-crisis interaction terms sum to zero.

We also examine how the outstanding amount of financial commercial paper is related to a measure of the convenience yield, the GC-Treasury one-month spread. The results in Table 4 demonstrate that an increase in the convenience yield is associated with an increase in the (log of) outstanding amount of financial commercial paper. As before, we find that the sensitivity has increased since the crisis. The interaction term with the post-crisis dummy indicates that a 1 basis point increase in the GC-Tr 1m spread coincides with a 0.10% increase in financial paper outstanding.

Finally, we find a reduction in the average maturities of commercial paper, consistent with the view that these claims are issued in

T3 Commercial paper issuance and treasury bills outstanding

	Δ Financial commercial paper outstanding			
Δ Bills/GDP	-0.331*** (-3.38)	-0.0238 (-0.13)	-0.162 (-1.39)	-0.0238 (-0.13)
Δ Bills X I (July 2007-present)		-0.433** (-2.01)		-0.236 (-0.99)
I (July 2007-present)		-0.00208 (-0.94)		-0.00399 (-1.45)
Δ Bills X I (2012-present)			-0.560*** (-2.63)	-0.463** (-1.97)
I (2012-present)			0.000938 (0.40)	0.00345 (1.18)
Constant	-0.00115 (-1.04)	0.0000352 (0.02)	-0.00144 (-1.09)	0.0000352 (0.02)
p (crisis+post=0)				0.00609
Observations	819	819	819	819
R <sup>2</sup>	0.0138	0.0197	0.0223	0.0260

Sources: Federal Reserve Bank of St. Louis, Federal Reserve Economic Data – FRED (commercial paper outstanding and GDP) and Center for Research in Security Prices – CRSP (bills outstanding).

Note: Weekly regressions February 2001-December 2017.

t statistics in parentheses; \* p<0.10, \*\* p<0.05, \*\*\* p<0.01.

#### T4 Commercial paper issuance and GC-Treasury spread

	$\Delta$ Financial commercial paper outstanding			
$\Delta$ GC-Tr 1m	-0.00443 (-0.45)	-0.0138 (-0.97)	-0.0118 (-1.17)	-0.0138 (-0.97)
$\Delta$ GC-Tr 1m X I (July 2007-present)		0.0174 (0.89)		0.00336 (0.17)
I (July 2007-present)		-0.00240 (-1.06)		-0.00457 (-1.62)
$\Delta$ GC-Tr 1m X I (2012-present)			0.105*** (2.77)	0.104*** (2.64)
I (2012-present)			0.000782 (0.34)	0.00357 (1.25)
Constant	-0.000913 (-0.83)	0.000562 (0.32)	-0.00122 (-0.88)	0.000562 (0.32)
p(crisis+post=0)				0.00653
Observations	841	841	841	841
R <sup>2</sup>	0.000245	0.00251	0.00947	0.0126

Sources: Federal Reserve Bank of St. Louis, Federal Reserve Economic Data – FRED (commercial paper outstanding) and Bloomberg (general collateral repo rates).

Note: Weekly regressions February 2001-December 2017.

t statistics in parentheses; \* p<0.10, \*\* p<0.05, \*\*\* p<0.01.

#### T5 Commercial paper maturity and change in commercial paper maturity

	Share short commercial paper		$\Delta$ Share short commercial paper	
I (July 2007-present)	5.565*** (17.23)	5.280*** (13.45)	0.0396 (0.11)	0.0388 (0.12)
I (2012-present)		0.501 (1.28)	-0.0790 (-0.22)	-0.0795 (-0.23)
$\Delta$ GC-Tr 1m			1.869 (0.61)	
$\Delta$ GC-Tr 1m X I (July 2007-present)			1.552 (0.45)	
$\Delta$ GC-Tr 1m X I (2012-present)			12.24** (2.02)	
$\Delta$ Bills/GDP				-95.20*** (-3.22)
$\Delta$ Bills X I (July 2007-present)				-36.24 (-0.96)
$\Delta$ Bills X I (2012-present)				-90.60** (-2.54)
Constant	72.08*** (399.54)	68.53*** (265.61)	68.53*** (265.71)	0.00172 (0.01)
p(crisis+post=0)			<0.001	0.0371
Observations	843	843	843	794
R <sup>2</sup>	0	0.261	0.262	0.0141

Sources: Federal Reserve Bank of St. Louis, Federal Reserve Economic Data – FRED (commercial paper maturity and GDP);

Bloomberg (general collateral repo rates); Center for Research in Security Prices – CRSP (bills outstanding).

Note: Share of commercial paper with maturity under ten days over total commercial paper, in percent. Weekly regressions January 2002-December 2017.

t statistics in parentheses; \* p<0.10, \*\* p<0.05, \*\*\* p<0.01.

part to counteract variations in Treasury bill supply and that information-insensitivity can be recovered by shortening maturity. As shown in the first three columns of Table 5, on aggregate, commercial paper maturities shortened during the crisis, and have stayed at those levels.

What is more, we find that average maturities decrease when Treasury supply is low, or when the GC- Treasury one-month spread is high. We find that a 10 basis point increase in the GC-Tr 1m spread coincides with a 1.2% increase in the share of short maturity commercial paper; a 1% increase in bills/GDP coincides with a 0.91% decrease in short maturity commercial paper. In both cases, we reject the null hypothesis that the crisis and post-crisis interaction terms sum to zero.

#### 4| Conclusion

Since the financial crisis there has been an enormous amount of legal and regulatory changes with regard to banks. There has been new bank legislation in many countries and new bank regulations. Central banks have purchased large amounts

of safe debt. Some sovereign debt is no longer considered safe. Regulatory requirements have rendered large swaths of good collateral immobile, for example, the liquidity coverage ratio. What is the effect of all these changes – is the financial system safer? This is an important question. It is hard enough to evaluate individual policy and legal changes, much less the aggregate of the changes. The Lucas Critique suggests that there may have been unintended consequences.

In this paper we have tried to get at this question by looking at convenience yields, both in levels and in the responsiveness to Treasury supply shocks. Convenience yields summarise the scarcity of safe debt, short-term and by implication long-term safe debt. In general, we find evidence that shortages of short and long-term debt are higher now than pre-crisis. We also find suggestive evidence of a private response in the form of short maturity commercial paper issuance when convenience yields are high, or when Treasury supply is low. Overall, the preponderance of our results suggest that there is a shortage of safe debt now compared to the pre-crisis period, implying that the seeds for a new shadow banking system to grow exist.

## References

Barclays Capital (2012)

*Equity gilt study*: <http://topforeignstocks.com/2012/10/09/download-barclays-equity-gilt-study-2012>

Dang (T. V.), Gorton (G.) and Holmström (B.) (2012)

“Ignorance, debt and financial crises”, working paper.

Gorton (G.), Laarits (T.) and Metrick (A.) (2017)

“The run on repo and the Fed’s response”, working paper, November.

Gorton (G.), Lewellen (S.) and Metrick (A.) (2012)

“The safe asset share”, *American Economic Review: Papers & Proceedings*, Vol. 102, No. 3, May, pp. 101-106.

Gorton (G.) and Metrick (A.) (2012)

“Securitized banking and the run on repo”, *Journal of Financial Economics*, Vol. 104, No. 3, pp. 425-451.

Gorton (G.) and Muir (T.) (2016)

“Mobile collateral versus immobile collateral”, *National Bureau of Economic Research Working Paper*, No. 22619, September.

Greenwood (R.), Hanson (S. G.)

and Stein (J. C.) (2015)

“A comparative-advantage approach to government debt maturity”, *The Journal of Finance*, Vol. 70, No. 4, August, pp. 1683-1722.

Gürkaynak (R. S.), Sack (B.)

and Wright (J. H.) (2007)

“The US Treasury yield curve: 1961 to the present”, *Journal of Monetary Economics*, Vol. 54, No. 8, November, pp. 2291-2304.

Krishnamurthy (A.) and Vissing-Jorgensen (A.) (2012)

“The aggregate demand for treasury debt”, *Journal of Political Economy*, Vol. 120, No. 2, April, pp. 233-267.

Krishnamurthy (A.) and Vissing-Jorgensen (A.) (2015)

“Short-term debt and financial crises: what we can learn from US Treasury supply?”, working paper.

Sunderam (A.) (2015)

“Money creation and the shadow banking system”, *The Review of Financial Studies*, Vol. 28, No. 4, April, pp. 939-977.



# Changes in market-making: impact of technology and regulation

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*Market makers perform an essential role in financial markets by facilitating price discovery and providing liquidity to buyers and sellers who would not naturally interact. In recent years, technological innovation and forward-looking regulatory reforms have shown their potential to improve market-making capabilities and yield a more competitive landscape, benefiting investors through better pricing and more sources of liquidity, all at a lower overall cost to the financial system. These enhancements yield a lower cost of capital for businesses and governments, and better returns for private and public savings programmes.*

*Technological innovation has transformed markets, which have become more reliable, efficient, and cheaper to transact in. A new generation of market makers has emerged, using predictive analytics and modern risk management techniques to enhance price discovery and liquidity provision. However, in many parts of the fixed income, currency, and commodity (or FICC) markets, legacy structural barriers and frictions persist, impeding competition between new entrants and incumbent intermediaries. Certain forward-thinking regulatory reforms in the FICC markets – notably related to clearing and settlement, non-discriminatory access to trading venues, and real-time post-trade transparency – have begun to unlock greater competition, but the potential for further progress remains. Policy measures that promote fair, open, and transparent FICC markets will foster more competition and greater diversity in the market-making community, providing better pricing and liquidity to investors and contributing to resilience in times of stress.*

### 11 Introduction to market-making

In nearly every marketplace, intermediaries play a vital role in facilitating the matching of buyers and sellers, who rarely meet at the same time, at the same place, with the same volume to buy or sell, and with identical price expectations. The same is true in financial markets, where market makers facilitate trading in stocks, bonds, commodities, foreign exchange, and related derivatives. Market makers perform two important functions – price formation and liquidity provision.

Market makers contribute to the price formation process by providing quotes to buy or sell a given financial instrument to the marketplace. Market participants aim to transact at the best possible price, and the availability of competing quotes from market makers informs them of prevailing price levels. At the same time, market makers continuously update their quotes to assimilate new information based on, among others, current and anticipated supply (offers) and demand (bids) for a given financial instrument. Investor confidence is predicated on the belief that buyers and sellers are getting the most current, accurate price when they trade – so the timely and efficient assimilation of market moving information into prevailing price levels by market makers underpins investor confidence.

Market makers provide liquidity to the marketplace, acting as a buyer when a seller wants to sell, or as a seller when a buyer wants to buy. Since a seller may not find an ultimate buyer for a financial instrument at the exact time the seller wants to sell – a market maker can take the other side of the trade, allowing the seller to complete the transaction. Market makers commit their own capital to provide this liquidity, warehousing risks over different time horizons or maintaining an inventory of financial instruments to facilitate trading activity. Given variations in the volume and frequency of trading activity across financial products

and asset classes, the market-making business depends on correctly valuing and managing the risks assumed and the resources committed to providing appropriate and consistent liquidity. A healthy amount of liquidity benefits financial markets – liquid markets ensure that investors can efficiently deploy and redeploy capital as warranted. Where liquidity is impaired, valuations and investment returns suffer and issuers' cost of capital increases.

A range of market participants provide market-making services – from banks to broker-dealers to principal trading firms. While certain marketplaces, such as specific equity and options exchanges, have formal market-making designations that come with attendant quoting obligations, this is generally not the case in the fixed income, currency, and commodity (FICC) markets. Nevertheless, the vast majority of participants acting as market makers in FICC markets, whether as a bank or a non-bank, are regulated entities. In the United States, for example, there are non-bank broker-dealers and broker-dealers that are subsidiaries of bank holding companies. In addition, both banks and non-banks are registered as “swap dealers”. In the European Union (EU), non-bank market makers are regulated as investment firms, and both banks and investment firms may act as “systematic internalisers” under Markets in Financial Instruments Directive (MiFID) II. While banks have grown in recent decades to occupy a central role in many FICC markets (at times through the acquisition of broker-dealers), this is not a preordained state of affairs, and greater diversity among bank and non-bank market makers is both a historical reality and a future possibility. In this article, we generally use the term “new entrants” to refer to the new generation of analytically driven and technologically advanced non-bank market-making firms and the term “incumbent intermediaries” to refer to large global banking groups, though there are exceptions to these categorisations.

## 2I Optimising market-making in the financial system

Given the important role that market makers play in our financial system, a competitive market-making landscape is essential to ensuring that the overall quality and cost of market-making services are optimised. An open, level competitive playing field can foster further improvements in price formation and liquidity provision while driving down revenues earned by market makers. The ultimate objective is for market makers to deliver robust, efficient prices and a healthy and resilient supply of liquidity at minimal cost – where market makers earn a rate of return commensurate with the capital they deploy, the risk they take, and the competitive advantages they sustain over time.

History is unfortunately replete with examples where excess rents have been extracted from financial intermediation at the hands of investors who incurred artificially wide or inefficient pricing due to a lack of competition. Today, there are still significant variations across financial markets. While certain markets, such as the equity and futures markets, have become significantly more competitive and more efficient, many segments of the FICC markets lag behind, including the corporate and sovereign bond markets, the over-the-counter (OTC) derivatives markets (including interest rate swaps and credit default swaps), and the foreign exchange markets. Bank for International Settlements (BIS) research shows wide disparities across FICC products in terms of the degree of electrification.<sup>1</sup> Even across highly correlated products, such as sovereign bonds, sovereign bond futures, and interest rate swaps, there are often material differences in the competitive landscape. In addition, even within a given product such as interest rate swaps, the broader and more rapid adoption of clearing and trading reforms for USD swaps than for EUR swaps has translated into greater improvements in pricing and liquidity.<sup>2</sup> There are many variables

at play in this overall equation, but the most important driver of progress has been the competition fostered by new entrants when forward-thinking regulatory reforms catalyse market evolution. Under these conditions, investors benefit as all market makers are incentivised to improve pricing and liquidity in order to remain competitive.

Our modern, electronic equity markets are a prime example of the significant improvements that have been made over the past two decades. Intense competition among market makers has markedly improved conditions for all investors, who benefit from dramatically lower trading costs, improved market transparency and greater liquidity.<sup>3</sup> Improvements in FICC markets have been more limited and less universal. There are undoubtedly material differences between equity markets and FICC markets in terms of the types of instruments, composition of market participants, and legacy market structure – but there is no reason that greater competition in FICC markets should not yield similar improvements in pricing and liquidity at a dramatically lower net cost to investors. New entrants possessing superior skills to analyse, precision price, manage and warehouse risk are already beginning to compete in and transform parts of the FICC market, but further market evolution is required to fully harness their potential.

In the following sections, we will examine the prospects for improving FICC markets through a more competitive market-making landscape. Section 3 will explore how technology-driven innovations have improved markets overall, but how in many FICC markets, certain legacy structural barriers and frictions have limited competition. Section 4 will then examine how certain forward-thinking regulatory reforms have begun, and can continue, to address these legacy structural barriers and frictions, thereby unleashing the full benefits for the market of greater competition.

1 See Bank for International Settlements (2016).

2 See Benos et al. (2016).

3 See Angel et al. (2013).

### 3I Impact of technological innovation on competition in FICC markets: opportunities and impediments

Technological innovation has significantly transformed daily life, changing the way we communicate, obtain news and information, work, shop, and travel, among others – and the pace of technological change appears to have dramatically accelerated in recent years. The impact of technological innovation on financial markets has been no less profound – the benefits have been enormous and the changes are ultimately irreversible. Across many financial markets, technology has transformed the mechanisms through which buyers and sellers interact, the channels through which market data and market moving information are transmitted, the tools used to conduct research and analysis, and the platforms used by market makers to disseminate quotes, and by investors to obtain and compare quotes. Investors can now access transparent, electronic trading venues where competing quotes are available from numerous liquidity providers. News and information can be obtained on a more accurate and timely basis, improving investors' ability to make informed investment decisions. Once manual processes throughout the trade lifecycle have now been automated, allowing the overall investment and trading process to be conducted more economically and with far less operational risk.

In the market-making space, a new generation of analytically driven and technologically advanced market makers has emerged, competing against the legacy manual intermediaries that once controlled the markets. The use of predictive analytics and the efficient integration of market moving information allows these new entrants to provide up-to-date quotes to the marketplace. This has also led to innovations such as firm and immediately executable quotes in FICC markets where only indicative quotes were historically available. Greater automation of once manual processes, from auto-quoting to auto-hedging and the streamlining

of middle and back office workflows, has led to more scalable operations and a more efficient use of financial resources. New entrants' ability to precision price risk and to hedge and warehouse risk in a more timely, cost-effective, and reliable fashion together translate into more accurate prices and more reliable liquidity for investors, even in volatile market conditions. This ultimately allows both buyers and sellers to transact closer to the true market value of a financial instrument, thereby reducing their transaction costs.

In many FICC markets, these competitive forces have emerged, but to varying degrees. While a select number of new entrants have had the prowess and resources to break into the top echelon of the US Treasuries, foreign exchange, and OTC derivatives markets, legacy structural barriers and frictions have generally tilted the competitive playing field against new entrants and potential new entrants. New entrants often face significant hurdles to directly interacting with end investors and to overcoming information asymmetries in FICC markets. Meanwhile, where insulated from new challengers, incumbent intermediaries have maintained their roles as the dominant liquidity providers to investors and have not faced pressure to improve their pricing or liquidity. Where this dearth of competition persists, incumbent intermediaries have often not honed their market-making capabilities, increasing the deadweight losses borne by all. By contrast, when faced with new competition, incumbent intermediaries have often aggressively invested to improve their market-making capabilities. Investors thus benefit both directly and indirectly from improvements in pricing and liquidity that stem from greater competition between new entrants and incumbent intermediaries.

Addressing structural barriers and frictions that impair a more competitive market-making landscape in FICC products also has important implications for the resilience of liquidity – a topic that gets considerable attention in discussions of how new entrants have changed markets.<sup>4</sup>

<sup>4</sup> See Adrian et al. (2017); Anderson et al. (2015).

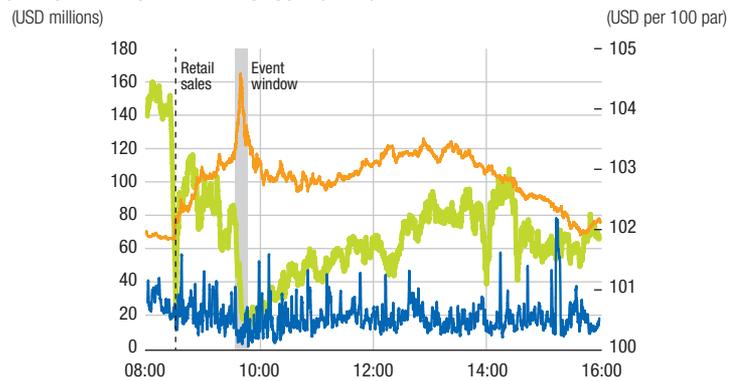
Many discussions of the resilience of liquidity in modern markets are premised on one of two flawed assumptions.

- The first is that certain market makers are in the business of “catching a falling knife”. It has simply not been the case in the past, nor is it today, that market makers manage to halt or counter a significant fundamentally driven correction in price levels. While market makers will play a role in facilitating price discovery to establish a new market equilibrium and may commit capital to counter a short-term price dislocation, they are not in the business of committing large amounts of capital to take directional positions to call the bottom of a market decline (or the top of a rally). Fundamentally driven, proprietary position taking is a distinct business from market-making, and is performed by a range of other types of market participants outside the market-making community (while select market participants may be engaged in both business lines, in some jurisdictions such overlaps are restricted, e.g. by the Volcker Rule in the United States).
- The second is that certain patterns of activity that are visible in today’s electronic, lit markets are somehow different than the patterns of activity that were simply invisible in yesterday’s manual, dark markets. Today, the quoting and trading activity of electronic market makers is generally visible – including during periods of market stress where such firms stay active on lit trading venues searching for a new market equilibrium – and thus can appear to contribute to market volatility. However, in non-electronic markets, the voice based discussions of prospective price levels that inevitably occurred during periods of market stress were merely hidden from broader view. Further, in periods of market stress, the fact that quotes and trades are now visible and executable may well compare favourably to the non-electronic era where bids and offers, to the extent available, were not widely accessible and may have been indicative in nature rather than executable.

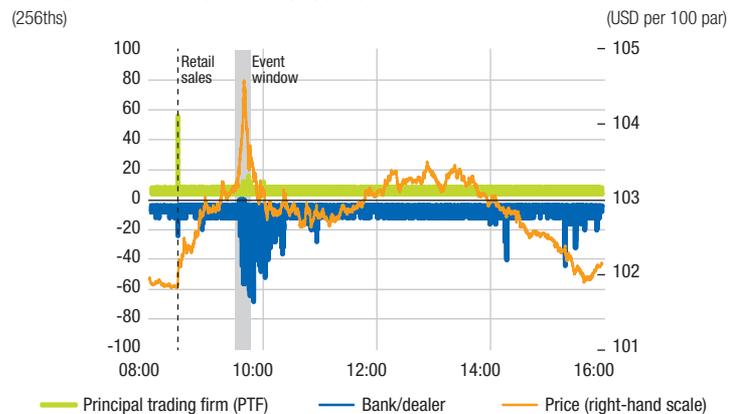
Discussions of the resilience of liquidity should instead focus on how a more competitive landscape can improve the performance of the market-making function in stressed market conditions. During a number of recent market events, a generally observed trend has been that many new entrants stay in the market with tight bid-ask spreads but smaller quote sizes, while incumbent intermediaries widen their bid-ask spreads but maintain more stable quotation sizes (see Chart 1, for example, which

C1 Reaction of banks/dealers and principal trading firms in the cash US Treasury market on 15 October 2014

a) Depth at top 3 levels by type (cash)



b) 10-year bid/ask spreads by type (cash)



Source: Joint staff report: the US Treasury market on October 15, 2014 (July 2015).  
 Primary source: BrokerTec; staff calculations.  
 Note: For Chart 1a, 1-minute moving average; sum of top 3 levels. For Chart 1b, 1-second observations; USD per USD 100 par.

shows the reactions of banks/dealers and principal trading firms in terms of quoted depth and bid-ask spreads to events in the cash US Treasury market on 15 October 2014).<sup>5</sup> The result is that many of the newer entrants are actively contributing to finding a new market equilibrium, but they are doing so without effecting significant risk transfer or integrating potentially larger and more price informative customer order flow. At the same time, incumbent intermediaries may be serving larger and more price informative customer order flows, but at less efficient prices and without directly contributing to the establishment of a new market equilibrium.

These different reactions generally reflect legacy structural impediments to competition that result in market segmentation. Markets, and in particular institutional investors, have thus still not harnessed the full potential that robust competition can deliver in terms of price efficiency, a healthy and resilient supply of liquidity, and right-sized rents.

Fortunately, these structural barriers and frictions can be addressed by market evolution catalysed by forward-thinking regulatory reforms. The next section will explore how key structural barriers and frictions can be, and are already being, addressed in a number of FICC markets. Ultimately, the goal is to make the following tasks as seamless as possible:

- establishing a new trading relationship;
- accessing competing quotes from a greater choice of counterparties;
- having adequate information to have confidence in quoted prices.

objective of these reforms has been to address systemic risk, embedded in the reform programme – from the 2009 G20 commitments through to the Dodd-Frank Act in the United States and the European Market Infrastructure Regulation (EMIR) and MiFID II in the EU – have been measures to make markets more fair, open, competitive and transparent. Other policymaking initiatives, such as the United Kingdom’s Fair and Effective Markets Review and the US financial regulators’ *Joint staff report: the US Treasury market on October 15, 2014*, have also highlighted areas where market functioning can be enhanced.

Market reforms have begun to address legacy structural barriers and frictions that have impeded the development of a more competitive FICC market, but have yet to be fully or universally implemented. In this section, we will explore three key forward-thinking regulatory reforms that should be expanded even further given their demonstrated potential to improve competition in market-making:

- expanding the use of, and access to, **central clearing and settlement** systems not only mitigates systemic risk and improves investor protection, but also materially simplifies the process for investors to establish new trading relationships;
- trading on **multilateral trading venues that provide non-discriminatory access** to all market participants allows investors to access competing quotes from a greater choice of counterparties;
- introducing greater **transparency** eliminates information asymmetries, providing investors with the confidence that quoted prices are fair and accurate and all market makers with the confidence to quote across market conditions.

### 4I Regulatory reforms that improve competition in FICC markets

Policymakers around the globe have pursued a comprehensive financial regulatory reform agenda since the financial crisis. While the headline

#### 4I1 Central clearing and settlement

The introduction of central clearing for OTC derivatives markets was a central part of the G20

<sup>5</sup> See Securities and Exchange Commission (SEC), Board of Governors of the Federal Reserve System (FRB), the Department of the Treasury (USD), Federal Reserve Bank of New York, and Commodity Futures Trading Commission (CFTC) (2015).

reform programme. Central clearing of derivatives delivers wide-ranging benefits, from mitigating systemic risk and instilling disciplined margining practices to protecting investors by insulating them from a trading counterparty's default and safeguarding their collateral. An additional, often overlooked, benefit of central clearing, however, is the greater choice of trading counterparties that it offers investors. Once investors participate in a centrally cleared market, they can confidently trade with any other market participant using the same central counterparty (CCP). The same dynamics also exist in other FICC markets, including for sovereign bonds and repurchase agreements (or repos), where initiatives are also underway to transition more activity into central clearing and settlement systems.

Central clearing and settlement can thus address a key structural barrier that otherwise impedes a more competitive market-making landscape – the ability to establish new trading relationships. This, in turn, helps unlock greater competition in the liquidity provision process. In the absence of accessible and efficient clearing and settlement mechanisms, an array of post-trade considerations, operational and credit risks and legal arrangements need to be addressed before any two market participants can establish a trading relationship. This creates unnecessary friction between potential counterparties, impairing the economics of seeking the best price for a transaction and the ability of all potential liquidity supply to meet all liquidity demand.

The recent introduction of central clearing in interest rate swap and credit default swap markets provides a prime example of how enhancing clearing and settlement mechanisms can lead to significant improvements in trading. In these markets, straight-through processing rules mean that trades are now submitted and accepted for clearing within seconds of execution. As a result:

- investors can access cleared markets more easily and enjoy a greater choice of trading counterparties;

- competition is enhanced as a key barrier to entry – negotiating complex documentation with each and every potential trading counterparty in the market – is removed;
- new and innovative trading protocols and trading venues can emerge to facilitate price discovery and risk transfer among a more diverse set of counterparties.

Collectively, these developments deliver better pricing, deeper liquidity, and greater transparency. Central clearing has delivered these benefits in jurisdictions where the clearing obligation has been fully implemented. Academic research has concluded that “the reduced counterparty risk and increased post-trade transparency associated with central clearing have beneficial effects on liquidity.”<sup>6</sup> New liquidity providers have entered both the cleared index credit default swap and interest rate swap markets.<sup>7</sup>

Skeptics of central clearing have posited that systemic risk is being concentrated in a handful of CCPs. However, while the growth in central clearing undoubtedly necessitates a robust supervisory regime and sound CCP governance and risk management standards, there is little doubt that the standardisation, predictability, transparency, and valuation and margin discipline of central clearing is superior to the complex, interconnected web of under-collateralised bilateral counterparty credit exposures that existed prior to the financial crisis. Nevertheless, choice among and competition between CCPs should be preserved, even as netting opportunities and economies of scale and scope may incent market participants to coalesce around fewer CCPs.

Policymakers should redouble their efforts to promote accessible and efficient clearing and settlement mechanisms in FICC markets. The implementation of central clearing in OTC derivatives markets is far from complete, and has stalled in certain jurisdictions. Central clearing mandates should be comprehensive, covering as

<sup>6</sup> See Loon and Zhong (2016).

<sup>7</sup> See, e.g., Rennison (2015); Smith (2016); Smith (2018).

many eligible counterparties as possible and a broader range of products. In the sovereign bond and repo markets, central clearing mechanisms do not serve the entire marketplace, and should be expanded. Finally, further regulatory calibration is needed to ensure that investors can access central clearing on reasonable economic terms. For example, pending amendments to the EMIR regime in the EU aim to ensure that clearing members provide their clients with access to central clearing on fair, reasonable and non-discriminatory terms, while a broad coalition of market participants and regulators have sought revisions to the Basel III supplementary leverage ratio to better reflect the risks inherent in, and the economics of, banks' client clearing offerings.

Expanding the use of, and access to, central clearing and settlement systems has been a central and successful component of post-financial crisis reforms to improve the safety and stability of the financial system. An often overlooked benefit of this transition is the removal of barriers and frictions to establishing new trading relationships. This, in turn, helps foster a more dynamic and competitive landscape for FICC market-making, ultimately yielding better pricing and more sources of liquidity for investors.

### 4I2 Multilateral trading venues that provide non-discriminatory access

Trading on multilateral trading venues that provide non-discriminatory access to all market participants builds on the foundation of central clearing and settlement by allowing investors to seamlessly access competing quotes from a greater choice of market participants. This addresses another key friction that exists in certain FICC markets – the difficulties faced by market participants seeking to access competing prices and counterparties. Here too, forward-looking regulatory reforms have been a catalyst for greater competition by requiring both new and existing trading venues to provide impartial and non-discriminatory access to all market participants, including new entrants.

Historically, the architecture of many FICC markets was designed to frustrate competition and protect the position of the largest incumbent intermediaries. A select group of incumbent dealers typically transacted with each other on exclusive dealer-only trading platforms that denied access to other market participants (both investors and potential competitors alike). Meanwhile, investors could only trade with that select group of incumbent dealers over-the-counter or on a limited number of dealer-to-customer trading platforms that would prohibit or otherwise restrict new entrants. This segmented and restricted market structure is opaque, inefficient and harms investors by fragmenting liquidity, hindering access to best execution, and reducing competition among the incumbent dealers.

Non-discriminatory access requirements correct these conditions and foster the development of markets that are more open, transparent, competitive, and efficient. Non-discriminatory access requirements promote competition by lowering barriers to entry for new liquidity providers, breaking up incumbent oligopolies, ensuring investor access to best execution, and providing investors with the freedom to execute with any other eligible counterparty.

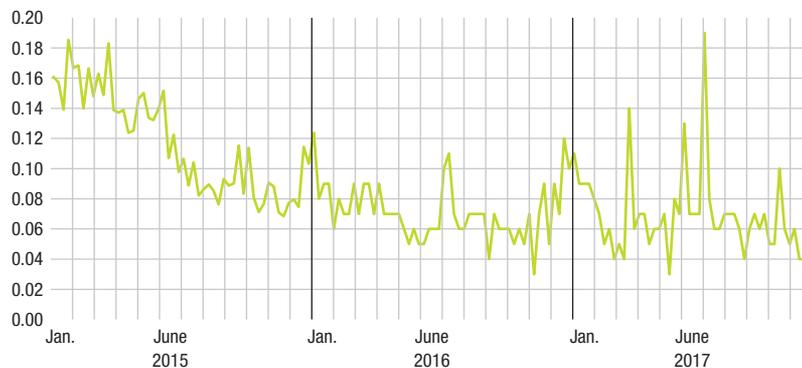
Trading on multilateral trading venues that provide non-discriminatory access has yielded significant benefits in affected markets. Bank of England research has found that in the United States, the introduction of new “swap execution facilities” (or SEFs) has led to a significant improvement in liquidity and a material reduction in execution costs, with end-users saving between USD 7 million and USD 13 million per day.<sup>8</sup> Since January 2015, Citadel Securities has observed a 50% decrease in bid-offer spreads in USD interest rate swaps traded on SEFs (see Chart 2).

Critics have nevertheless questioned whether the participation of new entrants on formerly incumbent-only trading venues is truly additive to the price discovery and risk transfer process.

<sup>8</sup> See above note 2.

## C2 USD interest rate swap (IRS) bid-ask spreads, by week, 2015-2017

(half spread in basis points)



Source: Citadel Securities.

Note: 2015 data represent weekly average half-spreads (mid to executed level) from competitors for all Citadel Securities observed request-for-quotes (RFQs). 2016 and 2017 data represent weekly average half-spreads (including Citadel Securities) for all Citadel Securities observed RFQs.

However, in addition to the pricing improvements noted above, diversifying participation has also increased market resilience. For example, in the wholesale US Treasury markets, broader access to trading venues has allowed many non-bank broker-dealers to aggressively compete as liquidity providers, and the benefits of having a broader and more diverse array of liquidity providers are clear. The events of 15 October 2014, one of the most volatile days in the history of bond markets, demonstrated the value of these new liquidity providers. As the US government's joint staff report<sup>9</sup> on the volatility of 15 October points out, non-bank participants maintained tight bid-ask spreads and continued to provide the majority of liquidity, while the banks widened bid-ask spreads and at times withdrew completely from the market. Meanwhile, the Chicago Mercantile Exchange (CME) Treasury futures market, which features the greatest number and diversity of participants, maintained tight spreads and firm quotes throughout the trading day.

Policymakers should continue to vigilantly enforce the existing requirements that trading venues provide non-discriminatory access, and look to expand such requirements across products

and markets. Such requirements have long been in place for exchanges and regulated markets for equities and futures. In the United States, the Dodd-Frank Act required SEFs to provide impartial access, while in the EU, MiFID II now applies non-discriminatory access requirements to "multilateral trading facilities" (MTFs) and "organised trading facilities" (OTFs). However, in both jurisdictions, the CFTC and the European Securities and Markets Authority (ESMA) respectively have had to issue further guidance prohibiting a range of anti-competitive access criteria that were nevertheless employed to erect access barriers and hinder competition – confirming that continued regulatory vigilance is essential.

Trading on multilateral trading venues that provide non-discriminatory access to all market participants addresses a second key barrier and friction to greater competition in certain FICC markets – challenges in efficiently accessing competing prices and counterparties. Allowing a broader array of market makers to compete to offer prices to investors, and allowing investors to more easily compare and choose among competing liquidity providers, will further improve pricing and liquidity.

<sup>9</sup> See above note 5.

### 413 Transparency

Information asymmetries are a final key structural barrier and friction that exist in many FICC markets, impeding a fairer, more transparent and more competitive market-making landscape. Post-trade transparency, in the form of real-time reporting of transaction sizes and prices to the public, can significantly reduce information asymmetries in the market, which in turn yields significant benefits.

- First, real-time public reporting provides investors with the information necessary to accurately assess execution quality. By enabling investors to compare the prices they receive from liquidity providers with concurrent trading activity across the market, post-trade transparency enhances investor confidence and incentivises price competition as investors are able to demand more accountability from their liquidity providers.
- Second, real-time public reporting promotes competition by levelling the playing field with respect to access to information about trading activity. With this knowledge, market makers are able to price risk more precisely and better manage their risks. In turn, market makers can quote prices, commit capital, and warehouse risk more confidently across all market conditions.
- Third, real-time public reporting contributes to market resilience by ensuring that changes in supply and demand are more efficiently reflected in current price levels. Greater transparency allows new information to be efficiently assimilated across the market, contributing to resilience in times of stress.

Academic studies have shown that increased transparency has delivered tangible benefits to investors in FICC markets where it has been implemented. US corporate bond spreads have narrowed following the introduction of trade reporting and compliance engine (TRACE) in 2002<sup>10</sup> and several studies have shown that

post-trade transparency has generally had positive effects on liquidity.<sup>11</sup> Similarly, studies in the OTC derivatives market have shown that increased post-trade transparency has contributed to improvements in liquidity.<sup>12</sup> Increasing the liquidity of an asset class reduces risk premiums and reduces the cost of capital for issuers. This, in turn, encourages greater capital formation, allowing businesses to invest to expand their operations and create jobs.

There is a fair policy question as to whether the details of a given trade should be private information that remains known only to the two counterparties to that trade, or public information available to all other market participants. On the whole, we believe that the market-wide benefits of better pricing, liquidity, competition, and market stability outweigh the costs of revealing information about an otherwise private transaction. Further, a number of protections exist to mitigate any unintended consequences from publicly disclosing trade details. Real-time post-trade transparency regimes generally provide trade-by-trade information on price, size, and execution time only – and never the identity of any individual market participant. In addition, for a subset of larger “block size” trades, volume caps are typically employed to mitigate concerns that the full disclosure of trade details could provide clues as to a trader’s identity or cause an outsized price impact.

Policymakers should continue to expand real-time post-trade transparency regimes in FICC markets. Today, such regimes are in place in the United States for futures, corporate bonds and, most recently, OTC derivatives. However, the US Treasury market continues to lack post-trade transparency. According to official estimates, over 50% of the secondary US Treasury market operates without meaningful post-trade transparency.<sup>13</sup> In Europe, the MiFID II framework has, in principle, introduced real-time post-trade transparency requirements for a range of FICC markets. However, in practice, this regime remains nascent. For the vast majority of transactions in European FICC markets, the

10 See Adrian et al. (2015).

11 See, e.g., Goldstein et al. (2007); Edwards et al. (2007); Bessembinder et al. (2006).

12 See, e.g., Loon and Zhong (2014); Loon and Zhong (2016).

13 See Fleming et al. (2016).

publication of trade details can still be deferred for four weeks, as opposed to being disseminated in real-time. In addition, EU sovereign bonds receive laxer treatment than other FICC instruments, increasing the cost borne by taxpayers for sovereign financing. Finally, globally, foreign exchange markets have no post-trade transparency regime. In each case, the perpetuation of information asymmetries comes at the detriment of investor confidence, liquidity, price competition, and market resilience.

The broader adoption of real-time post-trade transparency addresses a final key barrier and friction that exists in certain FICC markets – information asymmetries. The elimination of such asymmetries helps investors assess quoted price levels and hold their liquidity providers accountable. At the same time, it allows market makers to better price and manage risk, and by extension, to quote more accurately and to commit more capital across all market conditions. These developments together help foster a more competitive and resilient market-making landscape, improving liquidity and reducing issuers' cost of capital.

## 51 Conclusion

Market-making is undergoing a profound transformation as new entrants, advanced analytical capabilities, and the latest technologies transform markets and unleash greater competition – ultimately benefiting market participants through better pricing and liquidity. However, in FICC markets, further measures are needed to harness

these benefits. Market structure and regulation need to evolve and adapt in order to remove the remaining structural barriers and frictions that have impeded the development of a healthier and more competitive market-making landscape.

Fortunately, significant progress is already being made in certain segments of the FICC markets as policy measures introduced in the wake of the financial crisis have sought not only to reduce systemic risk, but also to promote fair, open, and transparent markets. These measures should be built upon and extended to more products and asset classes, as they hold the key to unlocking greater competition and diversity in the market-making community. In particular, policymakers should continue to expand the use of central clearing and settlement facilities, ensure non-discriminatory access to new and incumbent multilateral trading venues, and implement real-time post-trade transparency regimes in a broader array of FICC markets. Each of these measures has already demonstrated its potential to encourage a more dynamic and competitive market-making environment.

The FICC markets of the future, built on the foundation of an open, level competitive playing field, should fully harness innovation and feature a diversity of bank and non-bank market makers providing better pricing as well as deeper and more resilient liquidity to investors at a lower overall cost to the financial system. These improvements, in turn, lower the cost of capital for both corporate and sovereign issuers, and improve the rates of return for private and public savings programmes.

## References

Adrian (T.), Fleming (M.), Shachar (O.) and Vogt (E.) (2015)

“Has US corporate bond market liquidity deteriorated?”, *Liberty Street Economics*, Federal Reserve Bank of New York, October 5: <http://libertystreeteconomics.newyorkfed.org/2015/10/has-us-corporate-bond-market-liquidity-deteriorated.html>

Adrian (T.), Fleming (M.), Shachar (O.) and Vogt (E.) (2017)

“Market liquidity after the financial crisis”, *Federal Reserve Bank of New York Staff Reports*, No. 796, revised June: [https://www.newyorkfed.org/medialibrary/medialresearch/staff\\_reports/sr796.pdf](https://www.newyorkfed.org/medialibrary/medialresearch/staff_reports/sr796.pdf)

Anderson (N.), Webber (L.), Noss (J.), Beale (D.) and Crowley-Reidy (L.) (2015)

“The resilience of financial market liquidity”, *Financial Stability Paper*, No. 34, Bank of England October: <https://www.bankofengland.co.uk/-/media/boef/files/financial-stability-paper/2015/the-resilience-of-financial-market-liquidity.pdf>

Angel (J. J.), Harris (L. E.) and Spatt (C. S.) (2013)

“Equity trading in the 21st century: an update”, 21 June: <http://www.q-group.org/wp-content/uploads/2014/01/Equity-Trading-in-the-21st-Century-An-Update-FINAL1.pdf>

Bank of England, Financial Conduct Authority and Her Majesty’s Treasury (2015)

*Fair and Effective Markets Review – Final report*, June.

Bank for International Settlements (2016)

*Electronic trading in fixed income markets – Report submitted by a study group established by the Markets Committee*, January: <https://www.bis.org/publ/mktc07.pdf>

Benos (E.), Payne (R.) and Vasios (M.) (2016)

“Centralized trading, transparency and interest rate swap market liquidity: evidence from the implementation of the Dodd-Frank Act”, *Staff Working Paper*, No. 580, Bank of England, July: <http://www.bankofengland.co.uk/research/Documents/workingpapers/2016/swp580.pdf>

Bessembinder (H.), Maxwell (W.) and Venkataraman (K.) (2006)

“Market transparency, liquidity externalities, and institutional trading costs in corporate bonds”, *Journal of Financial Economics*, Vol. 82, No. 2, December, pp. 251-288.

Edwards (A. K.), Harris (L. E.) and Piwowar (M. S.) (2007)

“Corporate bond market transaction costs and transparency”, *Journal of Finance*, Vol. 62, No. 3, June, pp. 1421-1451.

Fleming (M.), Keane (F.) and Schaumburg (E.) (2016)

“Primary dealer participation in the secondary US Treasury market”, *Liberty Street Economics*, Federal Reserve Bank of New York, 12 February: <http://libertystreeteconomics.newyorkfed.org/2016/02/primary-dealer-participation-in-the-secondary-us-treasury-market.html>

Goldstein (M. A.), Hotchkiss (E. S.) and Sirri (E. R.) (2007)

“Transparency and liquidity: a controlled experiment on corporate bonds”, *The Review of Financial Studies*, Vol. 20, No. 2, March, pp. 235-273.

Loon (Y. C.) and Zhong (Z. K.) (2014)

“The impact of central clearing on counterparty risk, liquidity, and trading: evidence from the credit default swap market”, *Journal of Financial Economics*, Vol. 112, No. 1, pp. 91-115.

Loon (Y. C.) and Zhong (Z. K.) (2016)

“Does Dodd-Frank affect OTC transaction costs and liquidity? Evidence from real-time CDS trade reports”, *Journal of Financial Economics*, Vol. 119, No. 3, March, pp. 645-672: [https://econpapers.repec.org/article/eeefineclv\\_3a119\\_3ay\\_3a2016\\_3ai\\_3a3\\_3ap\\_3a645-672.htm](https://econpapers.repec.org/article/eeefineclv_3a119_3ay_3a2016_3ai_3a3_3ap_3a645-672.htm)

Rennison (J.) (2015)

“New players break into credit derivatives”, *Financial Times*, 17 November: <http://www.ft.com/intl/cms/s/0/22b83fa4-8c6e-11e5-8be4-3506bf20cc2b.html#axzz3rj5MtwiI>

Securities and Exchange Commission,  
Board of Governors of the Federal Reserve System,  
the Department of the Treasury,  
Federal Reserve Bank of New York, and Commodity  
Futures Trading Commission (2015)

*Joint staff report: the US Treasury market, October 15, 2014*, 13 July: [http://www.treasury.gov/press-center/press-releases/Documents/Joint\\_Staff\\_Report\\_Treasury\\_10-15-2015.pdf](http://www.treasury.gov/press-center/press-releases/Documents/Joint_Staff_Report_Treasury_10-15-2015.pdf)

Smith (R. M.) (2016)

“Dealer algos strike back in swaps market showdown”, Risk.net, 24 February: <http://www.risk.net/risk-magazine/feature/2446836/dealer-algos-strike-back-in-swaps-market-showdown>

Smith (R. M.) (2018)

“MUFG launches CDS franchise in US with bet on volatility”, Risk.net, 1 February: <https://www.risk.net/derivatives/5397236/mufg-launches-cds-franchise-in-us-with-bet-on-volatility>



# **New forms of credit intermediation**



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

**Klaas KNOT**  
President  
De Nederlandsche Bank

*In the past decade, a significant part of mortgage lending in the Netherlands has shifted from banks to non-banks, particularly insurers and pension funds. This shift can be partly attributed to changes in regulation, low interest rates and search for yield. The more prominent role of insurers and pension funds is not a new phenomenon, however, as they used to be dominant players in the past. From a financial stability perspective, the shift towards institutional investors has important advantages, as it increases diversity and is likely to make mortgage provision less procyclical.*

Since the global financial crisis, non-bank lending as a share of total financial intermediation has increased in many jurisdictions (Financial Stability Board – FSB, 2017). This is also the case in the Netherlands, where a significant part of credit supply has shifted from banks to non-bank lenders and to direct finance via financial markets (De Nederlandsche Bank, 2016). This article focuses on the increasing role of institutional investors on the Dutch residential mortgage market.

In recent years, about one third of new mortgage lending has been supplied by non-banks (see Chart 1). As a result, the share of banks in the total amount of mortgages outstanding – which was around 80% at the start of the crisis – is gradually declining. The more prominent role of non-bank mortgage lenders is not new: they used to be dominant players in the 1950s and gradually lost market share to banks. It remains to be seen whether the recent shift will continue or whether banks will restore their position as the main mortgage providers. The increase in non-banking lending is also not just a Dutch phenomenon: in several European countries, the share of non-banks in long-term lending to households is rising (European Central Bank – ECB, 2017).

The next Section discusses the main drivers of the recent shift in mortgage lending to non-banks. Section 2 places this development in a historical context and shows how the market shares of banks and institutional investors have evolved over the past decades. Section 3 discusses the financial stability implications of the larger role played by institutional investors as mortgage lenders. Section 4 concludes.

### 11 Main drivers

The recent shift in lending from banks to non-banks can be largely attributed to search for yield and regulatory changes. In addition, the entry of new investors into the Dutch mortgage market is being facilitated by the fact that several activities can be outsourced to existing financial service providers.

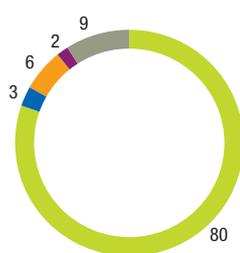
#### 11.1 Low interest rates and search for yield

As in other countries, insurers and pension funds in the Netherlands face downward pressure on expected returns due to the low interest rate environment. This situation has increased incentives to look for alternative investments with higher returns, limited risk and relatively low solvency

C1 Increasing share of non-bank mortgage loans in the Netherlands

(%)

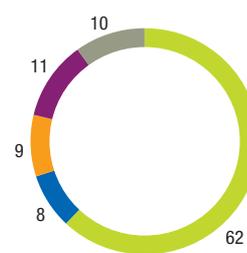
a) Outstanding debt – 2010



b) Outstanding debt – 2016



c) New loans – 2016



■ Banks

■ Bank subsidiaries of insurers

■ Insurers

■ Pension funds

■ Other

Source: De Nederlandsche Bank.

requirements. Mortgage loans are considered an attractive investment category, with relatively stable yields. Mortgage interest rates are higher than government bond yields, mainly because mortgages are less liquid. Insurers and pension funds are well-positioned to bear this illiquidity risk, given their long investment horizon. The credit risk on Dutch mortgages tends to be relatively low, as has been illustrated by the modest losses on mortgage loans over the past decade, despite a severe recession and a housing market correction (non-performing loans peaked at around 2% of the total mortgage portfolio).

Due to the low interest rate environment, borrowers are increasingly opting for loans with long fixed interest rate periods. Such loans are particularly attractive for insurers and pension funds, as they match the long-term nature of their liabilities and reduce their exposure to interest rate risk.

## 112 Regulatory changes

For banks, capital requirements have been tightened significantly by the new Basel Accord (“Basel III”), which was agreed in 2010, and the additional measures (“Basel III.5”) that were agreed in 2017. As a result, the amount and quality of capital that banks have to hold against mortgage exposures have increased, particularly for mortgages with loan-to-value (LTV) ratios of more than 80%. Capital requirements for insurers’ and pension funds’ mortgages have also been tightened in recent years, but not as much as for banks (see Box 1 and Chart 2).

Regulatory frameworks also influence the way investments in mortgage loans are implemented. Under Solvency II, for instance, capital requirements for non-securitised loans are lower than for an otherwise identical portfolio of securitised loans.<sup>1</sup>

<sup>1</sup> Capital requirements for non-securitised loans are based on a loss given default (LGD) module in Solvency II, while capital requirements for securitised loans are based on the credit spread risk. The strong increase in the credit spreads on securitised loans during the recent financial crisis was subsequently included in the calibration, leading to higher capital requirements for that type of loan.

### Box 1

#### Regulatory treatment of mortgages by sector

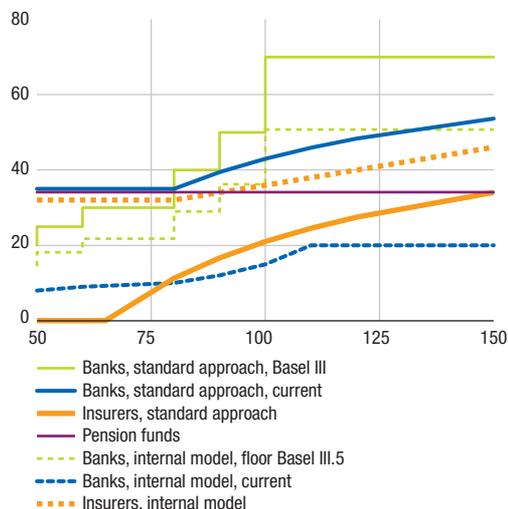
Banks, insurers and pension funds operate under different regulatory frameworks which are based on, respectively, global (Basel III), European (Solvency II) and domestic standards. An important difference is that the framework for banks is largely based on book values, whereas the framework for insurers and pension funds is based on market valuation. Another difference is between risk-weighted capital requirements for banks and scenario-based capital requirements for insurers and pension funds. Chart 2 presents a rough comparison for non-securitised mortgage loans that are not covered by the National Mortgage Guarantee scheme.

Under Solvency II, which came into effect on 1 January 2016, insurers are required to hold capital for mortgage loans, whereas they were not obliged to do this before. For higher loan to values (LTVs) especially, capital requirements increase to a higher level than for banks under the current internal models. Chart 2 shows that capital requirements for insurers with internal models are higher than under a standard formula. In practice, capital requirements for insurance companies with internal models are lower as they are allowed to use a dynamic volatility adjustment that dampens the total capital requirement. This advantage is, however, not reflected in Chart 2, as it cannot be modelled specifically for the mortgage portfolio but only for *all* investments.

With the implementation of the revised Financial Assessment Framework in 2015, pension funds’ capital requirements have risen by roughly 40%.

### C2 Capital requirements: banks vs. institutional investors

(x-axis: loan to value, y-axis: risk weight, %)



Source: De Nederlandsche Bank.

Note: Based on non-securitised mortgages, excluding mortgages covered by the National Mortgage Guarantee. See De Nederlandsche Bank (2016) for a further explanation of the methodology used to construct this chart.

This explains the strong increase in non-securitised mortgage investments by insurers, at the expense of investments in securitised mortgages.

### 113 Financial services

The entry of new investors into the Dutch mortgage market is being facilitated by the presence of financial service providers. More than half of all mortgages are sold through independent mortgage advisors, which typically offer products from a wide range of lenders. In addition, specialised firms provide support for specific tasks, such as loan origination and administrative services. Hence, new mortgage suppliers do not need to invest in a distribution network and can outsource several activities. Box 2 presents an overview of the channels through which insurers and pension funds invest in mortgages.

Dutch mortgages have increasingly evolved into a standardised product. Due to recent measures to

#### Box 2

#### How do insurers and pension funds invest in mortgages?

There is significant variation in the extent to which insurers and pension funds invest in mortgage loans. Life insurers have the largest exposures to mortgages in their investment portfolios (16% of total assets in 2016), followed by non-life insurers (4%) and pension funds (2%). Moreover, differences between individual insurers and pension funds are also substantial. In the insurance sector, the six largest institutions invest most in mortgage loans. In the pension sector, the largest funds invest relatively little in mortgages but medium-sized institutions have relatively large exposures to mortgages.

Although the role of institutional investors in the mortgage market is not new, their approach has changed. For instance, in the 1950s and 1960s pension funds originated mortgage loans themselves, whereas they now mostly invest in loans issued by third parties. There are several ways for insurers and pension funds to invest in mortgages:

- *Bank subsidiaries.* This is an important channel, in particular for insurers that have bank subsidiaries.
- *General mortgage funds.* These are broad mortgage funds; individual investors have no direct influence on the specific characteristics of the loans in these funds.
- *Specific mortgage funds.* These have an explicit mandate, typically focusing on mortgages with specific characteristics (e.g. risk profile, maturity). These funds can be owned by a group of institutional investors or one specific investor.
- *Mortgage loans originated by banks.* Institutional investors can purchase mortgage portfolios or invest in securitised mortgages. This channel only plays a very minor role in the Netherlands.

Compared to banks, institutional investors mainly focus on mortgages with very long maturities, which are the best match for their liabilities. Institutional investors traditionally invest in relatively low-risk mortgages, which are covered by the National Mortgage Guarantee scheme (*Nationale Hypotheek Garantie* – NHG). In recent years, however, the proportion of non-guaranteed mortgages has increased due to the lowering of the NHG limit and rising house prices.

reduce the beneficial tax treatment of mortgage interest payments, nearly all new mortgages are more or less standardised annuity products. This contrasts with the past, when a significant proportion of new mortgages consisted of interest-only loans and endowment mortgages that were linked to a savings or investment product (De Nederlandsche Bank, 2017a).

## 21 Back to the future: developments since 1950

The recent rise of institutional investors in the mortgage market is not unprecedented. After the housing market correction in the early 1980s, there was a similar shift from banks towards non-banks (see Chart 3). Further back in time, the role of institutional investors was even more pronounced. In the early 1950s, institutional investors – particularly life insurers – held almost half of the mortgage debt outstanding. Moreover, a significant share of loans in these years was provided by mortgage banks, whose business model was very different from traditional banking as they mainly funded themselves with covered bonds rather than deposits. The increasing dominance of banks over the past decades is largely due to three factors.

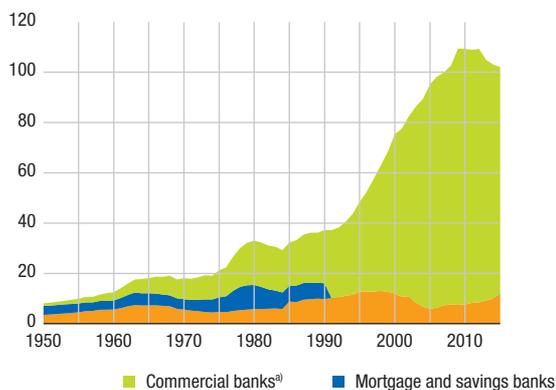
First, banks were better able to accommodate the rapidly increasing demand for mortgage loans than institutional investors, due to their more elastic balance sheets. The rising demand for mortgages reflected a broader expansion of retail finance due to increasing economic prosperity and home ownership. In particular commercial banks broadened their supply of retail products, at the expense of mortgage and savings banks as well as institutional investors. As a result, the proportion of mortgage lending on banks’ balance sheets increased over time. This development has also taken place in other advanced economies (Jordà et al., 2016).

Second, institutional investors’ investment portfolios have changed significantly in the past decades. From the early 1990s, institutional investors invested an increasing proportion of their assets abroad and shifted from mainly fixed income to more equity. In 1990, about 80% of fixed income assets were invested in the Netherlands, compared with a current level of around 20%. As a natural consequence of this shift, institutional investors became less active in the mortgage market. This was also the period in which the Dutch mortgage debt as a percentage of gross domestic product (GDP) really took off, facilitated by banks.

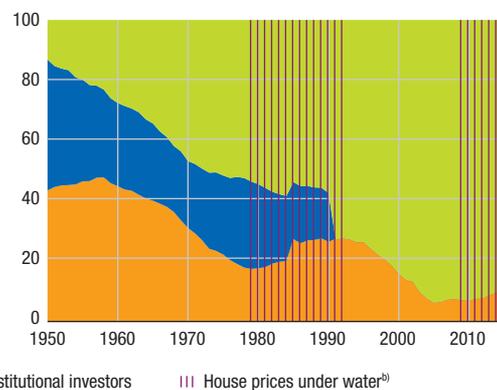
### C3 Shifts in Dutch mortgage lending

(%)

a) Percentage of GDP



b) Relative shares



Source: De Nederlandsche Bank.

a) Commercial banks and agricultural banks; since 1990 the category has also included mortgage and savings banks.

b) Periods with declining house prices, until recovery to the previous peak.

Third, until recently, changes in regulation made it easier and more attractive for banks to increase their mortgage portfolios. Until the early 1990s, De Nederlandsche Bank imposed credit restrictions on banks as an instrument to contain excessive domestic money creation. Van Ees et al. (1999) present empirical evidence that imposing and – especially – withdrawing restrictions had a significant impact on credit supply. In addition, it can be observed that mortgage lending by banks as a percentage of GDP accelerated after De Nederlandsche Bank abandoned its credit restriction policy. Prudential capital requirements have also been loosened over time. In the 1950s, commercial banks were required to hold at least 10% capital against mortgage loans. Over time, this has been reduced significantly, especially with a revision of the solvency framework in 1977 and the introduction of Basel II in 2007, which led to a non-weighted capital requirement of less than 1% for mortgages. Under Basel III, capital requirements have been tightened again (see Box 1).

Finally, it should be noted that the distinction between banks and non-banks has not always been very strict. As already mentioned, specialised mortgage banks used to play an important role in the past but, despite their name, these institutions should not be considered traditional banks, as they funded themselves with long-term bonds rather than deposits. Mortgage banks have disappeared as a separate category; most of them have been taken over by insurance companies and commercial banks. From the 1990s, the distinction between banks and insurers was somewhat blurred as a significant share of both sectors was made up of companies that were part of a financial conglomerate (ING, Fortis, SNS Reaal).<sup>2</sup> In the past years, most conglomerates have been split up again into independent banks and insurance companies.

### 3I Financial stability perspective

It is difficult to predict whether the increased market share of institutional investors is only temporary – as in the 1980s – or whether they will continue to play

a significant role as suppliers of mortgage loans. After all, some of the drivers – such as search for yield – are temporary in nature. The rise of institutional investors in the mortgage market is, however, beneficial to financial stability for three reasons.

First, a more prominent role for institutional investors would help to reduce maturity mismatches and funding risks in the banking sector. Due to their mortgage portfolios, Dutch banks have a relatively large maturity mismatch, while a significant part of the mortgage expansion from the 1990s onwards had to be financed by non-deposit funding which – as the recent crisis has illustrated – can cause vulnerabilities if financial market sentiment deteriorates. For institutional investors, by contrast, mortgages are a very good match for their liabilities because interest rates are typically fixed for ten years or more. Insurers and pension funds mainly provide mortgages with long fixed interest periods of 20 years, while the shorter maturities are still dominated by banks (De Nederlandsche Bank, 2016).

Second, greater reliance on institutional investors may reduce the procyclicality of mortgage lending. Chart 3 shows that market shares follow a cyclical pattern, with the weight of banks increasing during booms and declining during busts. In other words: bank lending seems to be procyclical while institutional investors are non-cyclical or even countercyclical. At the end of the 1990s, the procyclical nature of mortgage lending was clearly visible in the mutually reinforcing spiral of increasing house prices and credit growth, which contributed to an overheating of the economy (De Nederlandsche Bank, 2002). Correlations confirm that banks' mortgage lending in particular is positively related to GDP growth, inflation and house prices (see Table 1). For institutional investors, these correlations are much lower and in most cases statistically insignificant.

Third, a larger role for institutional investors would increase the diversity of mortgage supply and enhance competition. More diversity in financing

<sup>2</sup> The figures presented in this article are based on sectoral definitions, i.e. they do not take into account the fact that some banks and insurers operated as part of the same conglomerate.

T1 Correlations between mortgage lending and macro-financial variables, 1970-2015

	Banks			Institutional investors		
	Previous	Current	Next	Previous	Current	Next
Yield curve (1 yr – 3 mths)	0.05	0.25 <sup>(c)</sup>	0.32 <sup>(b)</sup>	-0.11	-0.12	-0.06
GDP growth	0.71 <sup>(a)</sup>	0.70 <sup>(a)</sup>	0.69 <sup>(a)</sup>	0.17	0.24	0.27 <sup>(c)</sup>
Inflation (CPI)	0.52 <sup>(a)</sup>	0.47 <sup>(a)</sup>	0.48 <sup>(a)</sup>	0.26 <sup>(c)</sup>	0.20	0.20
Credit growth – private non-financial sector	0.82 <sup>(a)</sup>	0.86 <sup>(a)</sup>	0.75 <sup>(a)</sup>	0.25 <sup>(c)</sup>	0.22	0.25
Growth in equity prices	-0.24	-0.06	0.08	-0.14	0.15	0.22
Growth in house prices	0.53 <sup>(a)</sup>	0.74 <sup>(a)</sup>	0.73 <sup>(a)</sup>	0.07	0.16	0.10
Cumulative decline in house prices <sup>1)</sup>	0.66 <sup>(a)</sup>	0.67 <sup>(a)</sup>	0.60 <sup>(a)</sup>	0.00	-0.01	-0.03

Source: Kakes et al. (2017).

Note: The table shows the correlations between lending growth and other variables (simultaneous and with one-year leads and lags); annual data.

a), b) and c) indicate significance at, respectively, the 1%, 5% and 10% level.

1) For each observation, the house price minus the maximum house price during the sample period so far. When house prices are rising, this difference is zero; during periods of decline the difference becomes negative until the old maximum price is once again reached.

sources may reduce the system's vulnerability to financial crises, while greater competition may lead to increased efficiency and lower borrowing costs. In particular, pension funds may have scope for further expansion in the mortgage market, given their large asset portfolio (about two times GDP) and the relatively small proportion of mortgage loans in their portfolio (2%). However, at some point the expansion of institutional investors' mortgage loan portfolios will be curbed by the size of their assets and their requirement for asset diversification. Indeed, the allocation of resources will at a certain point reach a level where any further increase is no longer attractive from a risk-spreading perspective.

Despite these benefits, a shift in mortgage lending may also entail risks. In particular, new lenders may not be equipped to fully understand or manage the risks of a mortgage portfolio.<sup>3</sup> Mortgage loans are usually less liquid than, for example, government bonds, while the risk of early redemption makes returns on mortgage loans less predictable. Lack of expertise and of the capacity to assess the quality of business credit portfolios is one of the explanations for the modest role played by pension funds and insurers in financing small and medium business loans, where such risks are typically more pronounced than in the case of mortgages (De Nederlandsche Bank, 2016). If lending is done by third parties, the quality of

their services must be critically evaluated, as these parties do not bear the risks themselves.

#### 4I Conclusions and policy implications

Changes in regulation, low interest rates and search for yield have led to an increase in the role of pension funds and insurers in the Dutch mortgage market. The rise of institutional investors in the mortgage market is beneficial to the financial system, as it eases procyclicality and bolsters diversity and competition in the mortgage market. At the moment, it is not clear whether this increase in the role of pension funds and insurers will be permanent, since some of the drivers – such as search for yield – are temporary in nature. Hence, insurers and pension funds are only likely to play a major role in the mortgage market in the longer run if they have more structural incentives, such as the desire to better match assets and liabilities.

The scope for policy measures to influence the relative importance of different types of lenders is limited. However, the recent tightening of prudential regulation for banks, particularly more stringent capital and liquidity requirements, will make banks more resilient and less procyclical. Such measures are likely to lead to institutional investors playing a more structural role in the mortgage market and thereby improve the stability of mortgage provision.

<sup>3</sup> Recent research shows that the quality of risk management of mortgage portfolios varies per pension fund (De Nederlandsche Bank, 2017b).

## References

**De Nederlandsche Bank (2002)**

“Spotlight on household wealth management in the Netherlands”, *De Nederlandsche Bank Quarterly Bulletin*, June, pp. 27-36.

**De Nederlandsche Bank (2016)**

*Loan markets in motion – Larger role of pension funds and insurers boosts financial stability*, November.

**De Nederlandsche Bank (2017a)**

“Interest-only and investment-based mortgages”, *Financial Stability Report*, Autumn.

**De Nederlandsche Bank (2017b)**

“Results analysis investments in mortgages”, *Nieuwsbericht*, 8 September, in Dutch.

**European Central Bank (2017)**

*Financial Stability Review*, May, pp. 97-100.

**Financial Stability Board (2017)**

*Global Shadow Banking Monitoring Report 2016*, May.

**Jordà (Ò.), Schularick (M.) and Taylor (A. M.) (2016)**

“The great mortgaging: housing finance, crises and business cycles”, *Economic Policy*, Vol. 31, No. 85, pp. 107-152.

**Kakes (J.), Loman (H.) and van der Molen (R.) (2017)**

“*Verschuivingen in de financiering van hypotheekschuld*”, *Economisch Statistische Berichten*, Vol. 102, No. 47495, May, pp. 69-73, in Dutch.

**Van Ees (H.), Sterken (E.) and Garretsen (H.) (1999)**

“Some evidence on the relevance of bank behaviour for the lending channel in the Netherlands”, *De Economist*, Vol. 147, No. 1, pp. 19-37.

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

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*The US economy has seen the rise of new forms of credit intermediation based on emerging technologies and business models designed to meet the needs of consumers and small businesses. These new forms of digitised lending and servicing, referred to as marketplace lending, have been driven by new entrants to financial services. This paper explores the types of firms in this industry, how the market has developed, and how it compares to US banking organisations. These new digitally enabled lenders have generated significant attention despite their relatively small market footprint today. In part, this attention is driven by a recognition that many of the underlying features of these new lending models, particularly the potential to sustainably expand access to credit through new credit models and approaches to the use of data, may have widespread application across the banking and financial ecosystem.*

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The US economy has seen the rise of new forms of credit intermediation based on emerging technologies and business models designed to meet the needs of consumers and small businesses. These new forms of digitised lending and servicing, referred to as marketplace lending, have been driven by new entrants to financial services. Many of these entrants have pursued a wide range of partnership models with traditional banks, addressing a variety of capital, consumer access and regulatory issues.

This article (i) reviews the products and business models used in these emerging credit intermediation channels; (ii) discusses key recent developments in these markets and the markets' potential growth; and (iii) identifies how such channels may differ from traditional bank products and services with respect to access to credit, business model, and regulatory structure.

These new digitally enabled lenders have generated significant attention despite their relatively small market footprint today. In part, this attention is driven by a recognition that many of the underlying features of these new lending models, particularly the potential to sustainably expand access to credit through new credit models and data, may have widespread application across the banking and financial ecosystem.

## 11 Scope of products and business models

### 111 Business model features

The business models that have been adopted by marketplace lenders can be characterised by their target product segment, the manner by which they access the national market, and capital and risk management strategies (see Table 1 *infra*).

#### Target product segments

The focus of marketplace lenders has primarily been the provision of unsecured credit to individuals

(primarily for the purpose of debt consolidation) and working capital to small businesses. However, business models are constantly evolving and firms are beginning to expand into other product segments.

- *Unsecured consumer*. In this segment, consumers are typically accessing credit to pay down credit card or other debt, finance an online purchase or manage variable expenses. A typical unsecured consumer loan in this market has a balance of USD 14,000; an annual interest rate of 14.7%; and a four-year term.<sup>1</sup> This is the largest product segment amongst marketplace lenders, and the largest of these lenders includes LendingClub and Prosper.
- *Consumers with student debt*. This sector generally focuses on refinancing for borrowers with relatively high average FICO scores<sup>2</sup> who can qualify for less expensive rates (generally ranging from 3-7%) from marketplace lenders than their existing student loan rates. Lenders in this space include firms such as SoFi, CommonBond, and Earnest.
- *Small business*. Small business loans are typically less than USD 500,000 with annual percentage rates (APRs) that may average between 40-45% with terms that range from six months to three years. Firms that specialise in this type of lending include Kabbage and OnDeck.
- *Low balance consumer lending*. A subset of unsecured consumer lenders focus on loans with shorter terms and higher interest rates that typically exceed 36% APR which is a notable rate threshold.<sup>3</sup> These loans typically have lower balances and below average credit characteristics and can be viewed as an alternative to other forms of lending, such as payday lending. Notable entrants include a firm like Elevate.

Strategy for national lending:  
bank partnership or direct lending

Marketplace lenders currently lend at a national level through two primary models: (i) a bank

<sup>1</sup> Information available from dv01: <https://www.dv01.co>

<sup>2</sup> The FICO score, based on the name of the company FICO, founded in 1956 (Fair, Isaac Corporation) is the standard indicator of consumer credit risk in the United States.

<sup>3</sup> The 36% rate cap for low balance consumer lending emerged in the first half of the twentieth century in the United States and still exists today as a statutory maximum in many states. For additional information, see Saunders (2013).

partnership model in which a bank originates the loan, generally sourced and then serviced by the marketplace lender and funded in a variety of manners (including purchase by the marketplace lending partner); and (ii) a direct lender model in which the marketplace lender acquires the applicable regulatory licenses in every US state in which it intends to do business. In practice, firms that target loan products where they charge interest rates that risk exceeding state-based usury limits generally seek to operate under a bank partnership model.<sup>4</sup> Under this model, federal law sets forth the preemption of state usury laws for loans originated by a national or state-chartered depository institution. Firms whose target loan products are at less of a risk of exceeding state usury limits (e.g. student loan refinancing) may find it more feasible to organise without the need for a bank partnership.

#### Other key business features

Beyond the foundational aspects of target product segments and lending models, firms are differentiating themselves along other key dimensions. These include credit risk profile, funding strategy, and approach to credit underwriting models (including speed of credit decisions and loan closing).

*Credit risk.* Fundamentally, the business model adopted by each marketplace lender will determine the degree to which it will retain the ongoing credit

risk of default on loans that have been originated. The predominant business model is generally “originate to distribute,” where there is limited long-term balance sheet retention of the originated loans. Most lenders, however, will retain servicing obligations on the outstanding loans – collecting payments from borrowers, remitting payments to creditors and handling loss mitigation. Some firms will assume a greater share of the ongoing credit risk exposure by retaining a share of loans (or some proportional share of credit risk) on the balance sheet sometimes through risk retention as a component of a securitisation transaction.

*Funding strategy.* Initially, marketplace lenders adopted a “peer-to-peer” funding model where individual loans were funded on digital platforms by individual investors, or “peers”, providing the majority of the capital. However, as the industry has developed, these funding structures have evolved and now include a wide variety of institutional sources. Today, firms may fund their business through some combination of retail notes, whole loans sales, securitisations, warehouse lines of credit, and the firm’s own balance sheets (supported by debt and equity investors). While some firms have publicly traded equity, including LendingClub and OnDeck, most firms are still privately held. Marketplace lenders have a range of funding structures with a diverse set of investors such as banks, traditional asset managers, hedge funds, family offices and high net worth individuals.

<sup>4</sup> Non-bank firms may use various approaches (in addition to the bank partnership model) to extend higher interest rates loan that might otherwise be precluded by applicable state usury laws.

#### T1 Business model features for a sample of lenders

Key features of business model	LendingClub	Prosper	Avant	Marlette Funding	Upstart	OnDeck	Kabbage	Square Capital	SoFi	Common Bond	Elevate	Zest Finance
Target product segment	Unsecured consumer					Small business			Student		Low-balance	
National lending strategy												
Direct lender						Y			Y	Y	Y	Y
Bank partnership	Y	Y	Y	Y	Y	Y	Y	Y		a)	Y	
Publicly traded?	Y					Y		Y			Y	
Credit risk	Varies in use of balance sheet and risk sharing											
Funding mix	Varies in reliance upon securitisation, retail, warehouse credit lines, loan sales, other											
Credit underwriting engine	Varies by use of newer credit models and data											

Sources: Company and various media reports.

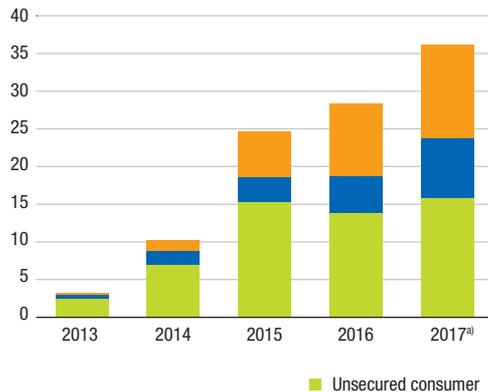
a) indicates the firm was once organised in this manner.



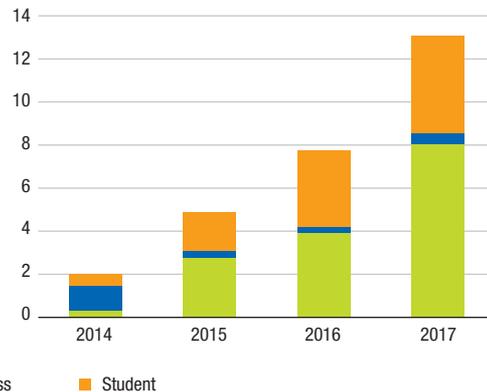
C1 Market growth

(USD billions)

a) Annual originations



b) Annual securitisation volumes



Sources: Standard & Poor's, S&P Global Market Intelligence (originations) and PeerIQ (securitisation volumes).

Note: Each methodology is based on a different subset of marketplace lenders.

a) Projections.

at Federal Deposit Insurance Corporation (FDIC) insured banks totalled USD 700 billion as of the third quarter of 2017.<sup>7</sup> These suggest large opportunities for marketplace lenders. However, the success of marketplace lenders in gaining share from these markets is limited by various factors including: the ability to gain market penetration, funding capacity, pricing terms, the propensity of consumers and small businesses to refinance or consolidate current debt, and the profitability of marketplace lenders through various economic and interest rate cycles.

Overall, while challenges certainly exist for the marketplace lending industry, firms operate in credit segments with potentially very large addressable markets.

The growth of marketplace lending volumes and the corresponding securitisation market have been on a strong upward trajectory since at least 2013 (see Chart 1 *supra*). Estimates for cumulative loans originated since 2014 total almost USD 100 billion according to industry data sources. Of this amount, unsecured consumer lending is

the largest category, amounting to about 50% of the total. LendingClub alone has generated USD 30 billion of this amount.<sup>8</sup>

The securitisation market for loans originated by marketplace lenders has similarly remained robust since securitisation of this type of credit began in 2013. PeerIQ, a data aggregation service that covers the marketplace lending securitisation market, reports that total securitisation issuance in the fourth quarter of 2017 was USD 28.3 billion and included 106 individual deals. This included 66 deals collateralised by unsecured consumer credit, 30 student deals, 9 small and medium-sized business (SME) deals, and one mortgage backed securitisation. The fourth quarter of 2017 saw a 100% growth rate in securitisations from the same period the prior year.

212 Growth challenges

Concerns with industry funding and conflicts of interest

In the first half of 2016, events at the largest marketplace lender<sup>9</sup> along with elevated market

7 See Federal Deposit Insurance Corporation (2017).

8 See Turner (2016); Turner (2017a); Turner (2017b).

9 The resignation of Renaud Laplanche, the CEO of LendingClub, in the second quarter of 2016 following an internal review of sales practices and a specific violation of trust with an individual investor led to a pause in loan purchases from LendingClub. See LendingClub (2016).

volatility exposed vulnerabilities within the business models of certain marketplace lenders and led to a brief downturn in industry volumes. Specifically, questions were raised about the fragility of the funding model and the potential for conflicts of interest between investors and marketplace lenders. In response, firms within the industry improved standards of their business models and the relationship with investors in order to address concerns about how loan characteristics are disclosed and how loans are allocated to investors, among other factors.

### Legal challenges

A federal court case, *Madden vs. Midland Funding*, has introduced considerable uncertainty into the development of the marketplace lending industry. Midland Funding, a non-bank debt buying firm, acquired a charged-off credit card loan that called for an interest rate that exceeded the rate permitted by the customer's home state of New York. While the original loan was made by a national bank that benefitted from the National Bank Act's preemption of state usury law, the US Court of Appeals for the Second Circuit held that National Bank Act preemption did not extend to the non-bank third-party debt buyer.<sup>10</sup>

This ruling could have significant implications for the marketplace lenders and for the secondary market for these loans. The securitisation market for marketplace lender credit relies on the principle that a loan that is deemed valid at the time it is made does not later violate state usury laws when that loan is sold or transferred (e.g. through the securitisation market). This principle, known as the "Valid-When-Made" doctrine, may have been placed at risk by the Second Circuit's decision. One study of the impact of the Second Circuit ruling in *Madden* showed an observable relative decline in the growth of such loans within the jurisdiction of the Second Circuit (New York and Connecticut), compared to loans originated outside the Second Circuit.<sup>11</sup>

Several other court cases, which instead have focused on the question of whether a bank or its non-bank partner is the "true lender" for determining the applicability of bank preemption laws, have also raised potential compliance risks for the bank partnership model used by many marketplace lenders.

### Industry best practices

Some in the industry have developed a set of best practices aimed at addressing potential areas of concern that could arise in marketplace lending models. For example, the MarketPlace Lending Association has enumerated a list of best practices for all of its member firms with regard to investor transparency and fairness, particularly focusing on important elements of investor protections. Other areas covered by the best practices include: responsible lending, safety and soundness of operations, governance and controls, and risk management. Other efforts have included work to improve small business disclosures and lending practices.

## 3I Observations and policy issues

### 3I1 Multifaceted relationships with traditional banking institutions

A large share of marketplace lenders operates using the bank partnership model, making banks critical to the core operating model for many of these firms. As such, marketplace lenders have a complex and multifaceted relationship with banking organisations, as illustrated in the following examples.

- Banks act as key financial service providers to marketplace lenders. Banks provide funding on both a short-term (often, for example, through warehouse lines of credit) and long-term basis (through loan purchases or sponsoring securitisations). In fact, one of the largest marketplace lenders reports that banks,

10 See *Madden vs. Midland Funding, LLC*, 786 F.3d 246 (2015), cert. denied, 136 S. Ct. 2505 (2016).

11 See Honigsberg, Jackson and Squire (2017).

for example, constitute nearly 40% of its loan investor base.

- Banks are the source of bank transaction data that non-bank lenders may use to make underwriting decisions within their credit underwriting models.
- Banks may refer loans to marketplace lenders when a potential borrower is outside the bank's own credit underwriting guidelines.
- Banks partner with a marketplace lender that will silently underwrite and service loans under a bank's brand (a process known as "white labelling").
- Banks contract with marketplace lenders for technology and software to support a lending solution that is either through a white-labelling or co-branded arrangement.

Banks also operate as direct competitors through either traditional business units or specially created online consumer units. For example, Goldman Sachs established an online lending unit, Marcus, which makes similar use of an online digital platform designed to target a similar unsecured consumer market segment.

### 3|2 Differentiating factors from traditional banking products and institutions

Whether marketplace lenders can realise the projected level of growth discussed above will be driven in part by a variety of factors, including the ability to sustainably differentiate their overall product and business model from traditional bank organisations.

#### Borrowers and loan features

For borrowers, loan products offered by marketplace lenders may provide features that are more flexible than some traditional bank products and, at times, carry lower interest rates. For example, bank credit

card products are typically offered as a revolving loan, whereas most unsecured consumer loans provided by marketplace lenders are offered on a term, fixed rate basis. While cards can carry higher interest rates than the term-based loans from marketplace lenders, a pure comparison of these two forms of credit remains difficult due to the value of incentives offered and repayment terms, among other features. Loan characteristics may also influence borrower preferences, including consumers and small businesses, particularly as to the extent that a pledge of collateral is required.

#### Cost and credit models

Ultimately, the ability to provide lower prices or more flexible terms than traditional lenders are based on expectations of a few potential business model advantages, including lower potential costs as a result of the efficiencies from online and automated digital delivery platforms, and the application of new credit scoring models that are expected to allow the delivery of lower prices for a similar unit of risk than competitors.

- *Lower cost structures.* Operating without legacy cost structures built around brick and mortar deposit branches should certainly provide a marginal cost advantage for marketplace lenders. Some analysts have compared the cost structures of the banking industry and those of some of the most prominent marketplace lenders and have concluded that there is a clear cost-structure advantage for new marketplace lender entrants. For banks, the cost to underwrite a new small business loan, for example, may be relatively fixed regardless of the amount borrowed, resulting in smaller loans being unprofitable to make for many banks.
- *Credit underwriting models.* Beyond simply automation and digitisation, marketplace lenders have also sought to use non-traditional approaches to underwriting designed to generate reliable credit decisions and pricing with instant speed. These models seek to improve upon

existing credit models so that marketplace lenders can safely expand or better price for credit for the same unit of risk taken by other lenders. To date, marketplace lenders have been regularly updating their credit models and target credit risk profiles, suggesting that such models have not yet reached maturity within this industry. These new models and data sources may also present certain compliance challenges with some consumer protection rules, such as those related to fair lending.

### Funding

Marketplace lenders' potential cost and credit model advantages need to be considered against the advantages generated by banks' reliance on relatively cheap deposit funding. Deposit funds, and in particular retail transaction accounts, have historically provided a highly stable and relatively low-interest rate cost of funds for banking organisations. Non-bank marketplace lenders, by contrast, do not have access to these types of retail deposit sources and thus often have interest rate costs that exceed many banks' average retail cost of funds.

Marketplace lenders' reliance upon institutional sources of funds, such as securitisation or loan sales to investors, has raised concerns from investors about the sustainability of such funding in different economic environments. In particular, there is concern about funding availability in a period of (i) market stress, particularly since marketplace loans may have credit performance that is highly correlated to the credit cycle, or (ii) rising interest rates, when the higher marginal yields on marketplace loans may diminish on a relative basis to other available asset classes.

### Regulatory framework

Banks and marketplace lenders operate under distinct regulatory regimes. In many cases, banks' overall oversight regime is more established and predictable and generally less fragmented

than the regimes faced by marketplace lenders today. Traditional bank lenders are examined comprehensively by their relevant prudential banking regulatory authorities. Marketplace lenders may be overseen by a number of federal and state agencies.

- Marketplace lenders that have a lending license in one or more states are subject to oversight by state regulators overseeing the provision of financial services. Lenders that have chosen the state licensing strategy and yet lend nationally face oversight from regulators in each individual state where they are licensed.
- Marketplace lenders that partner with banks are subject to oversight by federal banking regulations since they are considered third party service providers to a regulated banking entity. This oversight is mostly focused on the risks that the third party relationship could have on the bank, and are administered by the partnering banks. Marketplace lenders that use the bank partnership model may remain subject to various state requirements, depending on the approaches used by state regulators.
- If a marketplace lender were to obtain a banking charter – a state-based industrial loan company<sup>12</sup> (ILC) charter, or if implemented, the Office of the Comptroller of the Currency's (OCC) special purpose national bank charter<sup>13</sup> – it would be subject to direct federal supervision from either the FDIC (and a state regulator) in the case of an ILC, or the OCC, in the case of a special purpose national bank charter. As banks, ILCs are subject to extensive banking laws and regulations.

Marketplace lenders also share many common federal regulatory considerations with banks in areas such as consumer protections, anti-money laundering and securitisation.

- Consumer protections: for institutions engaged in lending (including marketplace lenders that

<sup>12</sup> See Federal Deposit Insurance Corporation (2004).

<sup>13</sup> See Office of the Comptroller of the Currency (2016).

are lending under state licenses), a number of consumer protection requirements may apply, including disclosure requirements under the Truth in Lending Act, anti-discrimination requirements under the Equal Credit Opportunity Act and provisions governing electronic transfers under the Electronic Funds Transfer Act. Marketplace lenders, if not licensed as a lender, may nevertheless be obliged to facilitate compliance with these types of consumer protection laws for bank partners. Marketplace lending may also be subject to requirements under the Fair Credit Reporting Act, the Fair Debt Collection Practices Act, and privacy and data security laws.

- **Securitisation:** to the extent that marketplace lenders engage in securitisation and offer those securities to the public, they would be subject to various provisions under the Securities Act of 1933 and must register the securities with the Securities and Exchange Commission (SEC), unless an exemption applies. These firms may also be subject to credit risk retention rules.
- **Anti-money laundering:** marketplace lending activities may also be subject to the Bank Secrecy Act (BSA) and its implementing regulations.

Marketplace lenders are not subject to numerous bank-specific regulations, ranging from Community Reinvestment Act (CRA) requirements to the vast suite of prudential standards like capital and liquidity standards, deposit insurance requirements and assessments, resolution planning requirements, and the prompt corrective action requirements.

### 3|3 Access to credit

The initial target lending segments of marketplace lenders have occurred in segments where banks and others have either curtailed credit or where they may not be favourably situated to compete. Citing data from Equifax, the MarketPlace Lending Association notes a major decline in lending activities: “*The issuance of transparent,*

*unsecured personal loans in the United States declined 44% between 2007 and 2014 (USD 62 billion to USD 35 billion).*”<sup>14</sup>

Early evidence indicates that these new lending channels have provided opportunities to expand credit to underserved segments. For example, a July 2017 study<sup>15</sup> found that new marketplace lenders have tended to expand credit in areas where bank branches have been on the decline. Moreover, this same study found that borrowers with similar credit risk profiles could obtain more favourably priced credit than alternatives, such as credit cards. The study also found some evidence that the use of alternative credit data in this space has allowed consumers with weaker traditional credit profiles (i.e. based on FICO scores) to access credit. This study used data from the largest marketplace lender, LendingClub, and covered loans originated between 2007 and 2016.

The conclusions of these studies, while preliminary, are not entirely unexpected given that the primary purpose of many marketplace loans is to refinance higher rate debt into less expensive debt. Moreover, a number of marketplace lenders are specifically aiming to build underwriting models designed to achieve better results through providing lower priced credit for a given traditional FICO score. However, with only a few years of credit performance, these credit models have yet to be tested in various macroeconomic environments that would include either higher rates of interest or a generalised downturn in the economy.

## 4| Conclusions

Following the 2008 financial crisis and the subsequent contraction of credit across many asset classes, a new breed of digitally enabled lender entered the financial services ecosystem. This new type of marketplace lender utilised new technologies and distribution channels to market directly to consumers while taking advantage of lower cost structures and employing some innovative

<sup>14</sup> See MarketPlace Lending Association (2017).

<sup>15</sup> See Jagtiani and Lemieux (2017).

funding structures in an effort to deliver credit to borrowers in an enhanced way.

Such provision of credit can generally be seen as a positive development for the financial system and economic growth to the extent that such lending sustainably (i) expands access to credit to those consumers and small businesses that would otherwise not be able to obtain it or (ii) lowers the overall cost of credit for borrowers.

While the substantial growth of the marketplace lending industry has not been without concern or risk, this activity remains quite small, with cumulative loan originations since 2014 amounting

to just 2% of the outstanding loan amount for the total consumer and small business market.

Marketplace lending has received attention exceeding what its size might warrant in part because of the recognition of its potential growth and perhaps just as important – a recognition of the potential broader uptake of many of its underlying features: the digitisation of lending, the use of new credit underwriting models and data, and the potential to expand access to credit. As these underlying features become increasingly common throughout the banking and financial ecosystems, policy makers will need to closely assess such developments.

## References

### Federal Deposit Insurance Corporation (2004)

“The FDIC’s supervision of industrial loan companies: a historical perspective”, *Supervisory Insights*, Summer: [https://www.fdic.gov/regulations/examinations/supervisory/insights/sisum04/industrial\\_loans.html](https://www.fdic.gov/regulations/examinations/supervisory/insights/sisum04/industrial_loans.html)

### Federal Deposit Insurance Corporation (2017)

“Quarterly banking profile – Third quarter 2017”, *Quarterly Banking Profile*, Vol. 11, No. 4: <https://www.fdic.gov/bank/analytical/qbp/2017sep/qbp.pdf>

### Federal Reserve Board of Governors (2017)

“Financial accounts of the United States – Third quarter 2017”, *Federal Reserve Statistical Release*, 7 December: <https://www.federalreserve.gov/releases/z1/20171207/z1.pdf>

### Honigsberg (C.), Jackson (R.) and Squire (R.) (2017)

“How does legal enforceability affect consumer lending? Evidence from a natural experiment”, *The Journal of Law and Economics*, forthcoming: [https://law.yale.edu/system/files/areal\\_workshop/leo/leo18\\_honigsberg.pdf](https://law.yale.edu/system/files/areal_workshop/leo/leo18_honigsberg.pdf)

### Jagtiani (J.) and Lemieux (C.) (2017)

“FinTech lending: financial inclusion, risk pricing, and alternative information”, *Federal Reserve Bank of Philadelphia Working Paper*, No. 17-17, 6 July, pp. 9-12: <https://www.philadelphiafed.org/-/media/research-and-data/publications/working-papers/2017/wp17-17.pdf>

### LendingClub (2016)

“LendingClub reports, first quarter 2016 results – Chairman and CEO Renaud Laplanche resigns”, *Company Release*, 5 September: <http://ir.lendingclub.com/file.aspx?IID=4213397&FID=34233669>

### MarketPlace Lending Association (2017)

“Request for proposals to foster economic growth”, *Letter to the Senate Banking Committee*, p. 2: [https://www.banking.senate.gov/public/\\_cache/files/5e1ccc5c-606d-4d0d-99a1-8549cc36326c/E27ADCB134143F20F094490D9E2EB3E0.marketplace-lenders-association-submission.pdf](https://www.banking.senate.gov/public/_cache/files/5e1ccc5c-606d-4d0d-99a1-8549cc36326c/E27ADCB134143F20F094490D9E2EB3E0.marketplace-lenders-association-submission.pdf)

### Office of the Comptroller of the Currency (2016)

*Exploring special purpose national bank charters for FinTech companies*, December: <https://www.occ.gov/topics/responsible-innovation/comments/special-purpose-national-bank-charters-for-fintech.pdf>

### Saunders (L. K.) (2013)

*Why 36%? The history, use, and purpose of the 36% rate cap*, National Consumer Law Center, April: <https://www.nclc.org/images/pdf/pr-reports/why36pct.pdf>

### Turner (E.) (2016)

“December 2016 – US digital industry landscape”, S&P Global Market Intelligence.

### Turner (E.) (2017a)

“2017 – US digital industry landscape”, S&P Global Market Intelligence.

### Turner (E.) (2017b)

“Q4’16 loan originations fall YOY for digital lenders, capping off a rocky year”, S&P Global Market Intelligence, 5 April.



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

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*The author looks at the developments in corporate finance, in the euro area and in France, since the mid-1990s. He first examines the nature of financing: the relative roles of self financing, bank credit, private equity. He then analyses, first from a positive point of view, the changes in the macro-financial equilibrium brought about by changes in corporate financing methods; then, from a normative point of view, whether these developments are desirable, and what problems they may pose from the point of view of monetary policy or financial intermediaries' regulations.*

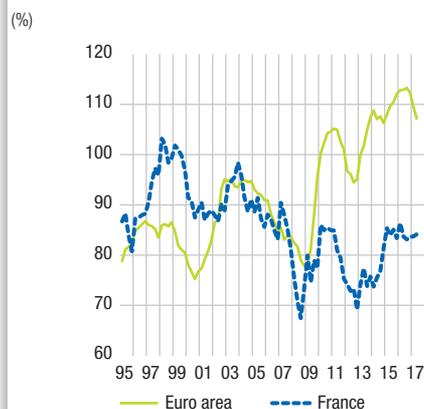
## 11 Developments in corporate financing in the euro area and in France

Non-financial corporations finance themselves through:

- self-financing (through available cash flows); Chart 1 shows the self-financing ratio, i.e. the ratio of cash flows to investment, of non-financial corporations;
- bank credit; Chart 2a shows the weight of business lending, Chart 2b shows its variation;
- bond issuance (Chart 3);
- issuance of listed shares (Chart 4);
- issuance of unlisted shares (Chart 5).

Unlisted shares cover the capital of family or industrial businesses, the holding of companies by private equity funds (see Chart 6).

### C1 Self-financing ratio

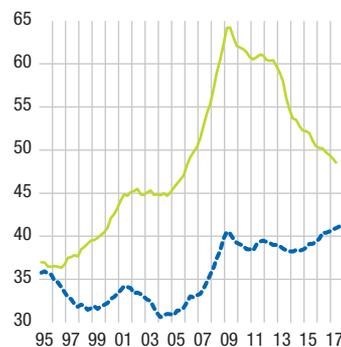


Sources: Datastream, Eurostat, Insee and Natixis.

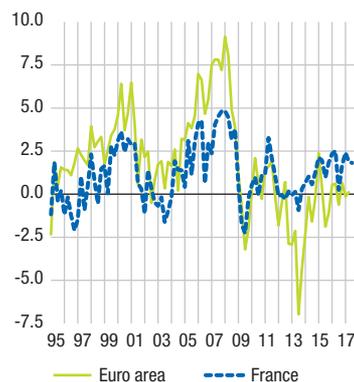
### C2 Business lending and its variation

(as a % of GDP in value terms)

#### a) Business lending



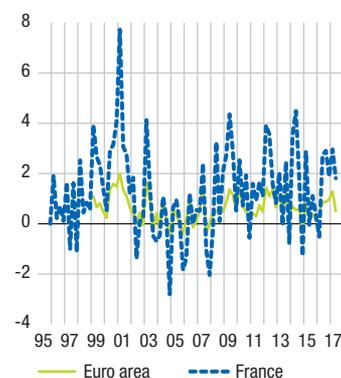
#### b) Variation in business lending



Sources: Datastream, ECB, Banque de France and Natixis.

### C3 Net bond issuance by non-financial corporations

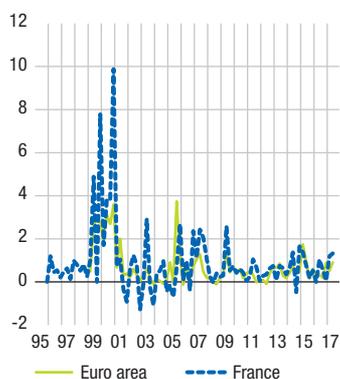
(as a % of GDP in value terms)



Sources: Datastream, Eurostat, Insee and Natixis.

### C4 Issuance of listed shares by non-financial corporations

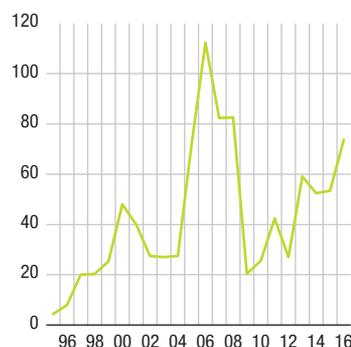
(as a % of GDP in value terms)



Sources: Datastream, ECB, Banque de France and Natixis.

### C6 Private equity in Europe (funds raised through leveraged buy-out, LBO)

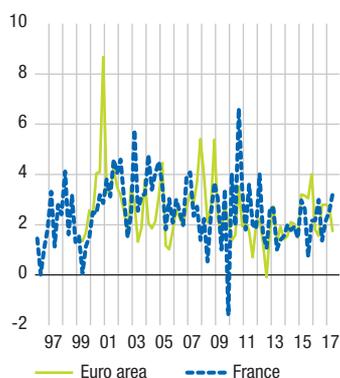
(EUR billions)



Sources: OECD and Natixis.

### C5 Issuance of unlisted shares by non-financial corporations

(as a % of GDP in value terms)



Sources: Datastream, ECB, Banque de France and Natixis.

Table 1 shows the size of different forms of corporate financing over different sub-periods.

The main developments are:

- in the euro area, an increase in the self-financing ratio, the weakness in the recent period of all other forms of financing, except the issuance of unlisted shares;
- in France, a self-financing ratio that remains close to 80%, a recourse to bank credit, the issuance of bonds, unlisted shares and much fewer listed shares to cover companies' financing needs.

### T1 Forms of corporate financing

(% for self-financing, as a % of GDP in value terms)

	Self-financing ratio	Total corporate investment	Bank credit variation	Net bond issuance	Net issuance of listed shares	Net issuance of unlisted shares
a) in the euro area						
1995-2001 average	82.40	12.24	6.65	1.06	1.95	3.38
2002-2009 average	88.62	11.83	3.42	0.41	0.49	2.69
2010-2017 average	105.54	11.50	-0.61	0.69	0.47	2.05
b) in France						
1995-2001 average	92.30	10.89	0.89	2.97	2.79	2.57
2002-2009 average	85.69	10.95	1.54	0.59	0.67	2.82
2010-2017 average	79.95	11.60	1.05	1.60	0.58	2.38

Source: Natixis.

The asymmetry between the euro area and France is clear: thanks to companies' higher profitability in the euro area (Chart 7), the self-financing ratio is now above 100% in the euro area (investments are more than fully self-financed), while it remains well below 100% in France (Chart 1 above).

This explains why, since the crisis, companies' debt ratio has continued to increase in France, whereas it has decreased in the euro area as a whole (Chart 8).

## 2I Resulting developments in the macro-financial equilibrium

What significant trends have emerged?

### 2I1 The transition to a situation where companies self-finance their investments

It seems that the situation in France will evolve in the direction of that of the euro area, with the increasing flexibility of the labour market and the decrease in corporate taxes that will restore profitability. We are therefore moving towards a model where companies self finance their investments, which means that the roles of bank credit and financial markets are diminishing (Table 1 above).

A number of studies<sup>1</sup> focus on this issue of rising corporate savings. They link it to the fall in the relative price of investment, to the incentive to buy back shares, to the incentive to hold liquidity reserves (cash), but in general they do not mention the organisation of the labour market.

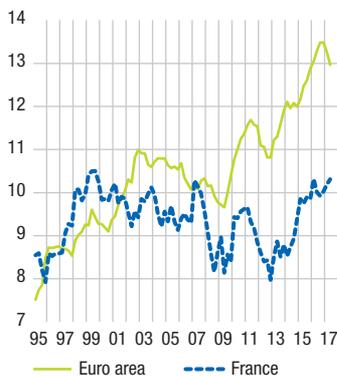
The macro-financial equilibrium has thus become very different: household savings (Chart 9a) are no longer used to finance companies which no longer need financing (Chart 9b), but are channeled into financing governments (Chart 9c).

This means that bond markets will increasingly become markets for government debts (Charts 10a and 10b) and that banks should gradually hold more and more public sector bonds (Chart 11), which is not yet the case today.

The role of banks or institutional investors will thus increasingly be to channel household savings into financing public deficits.

**C7 After tax profits, interest and dividends**

(as a % of GDP in value terms)



Sources: Datastream, Eurostat, Insee and Natixis.

**C8 Corporate debt**

(as a % of GDP in value terms)



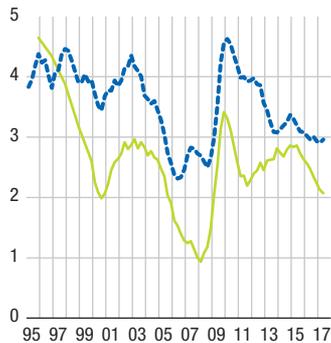
Sources: Datastream, Banque de France, ECB and Natixis.

<sup>1</sup> See Chen, Karabarbounis and Neiman (2017), Gruber and Kamin (2016), Bacchetta and Benhima (2015).

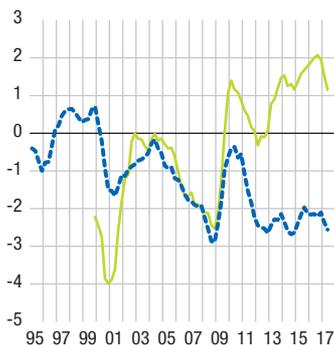
**C9 Net lending or net borrowing**

(as a % of GDP in value terms)

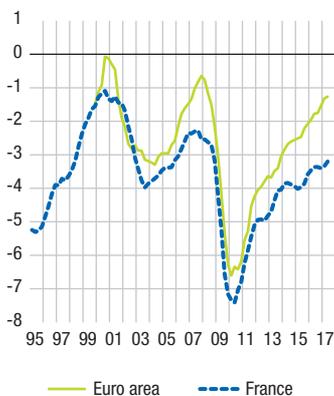
**a) Of households**



**b) Of non-financial corporations**



**c) Of governments**

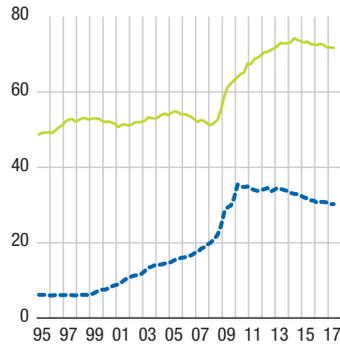


Sources: Datastream, ECB, Insee and Natixis.  
Note: Net lending if > 0, net borrowing if < 0.

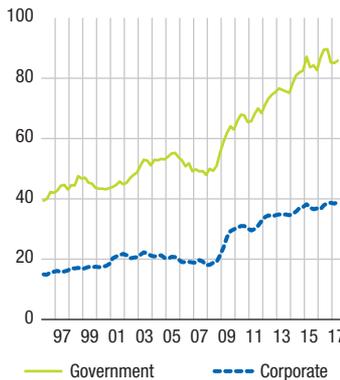
**C10 Outstanding amount of government and corporate bonds**

(as a % of GDP in value terms)

**a) In the euro area**



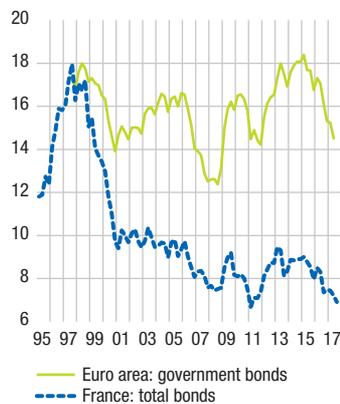
**b) In France**



Sources: Datastream, Insee, Banque de France, Natixis and ECB.

**C11 Outstanding amount of bonds held by banks**

(as a % of GDP in value terms)



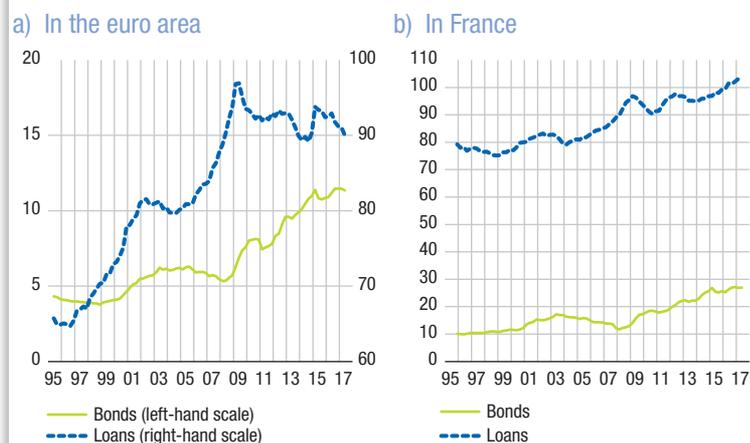
Sources: Datastream, ECB, Banque de France and Natixis.

## 212 The disintermediation of corporate financing

Companies therefore need less external financing, but within external financing, bond issuance is replacing bank credit, which means that the disintermediation of corporate financing has started (Charts 12a and 12b).

**C12 Bond outstandings and loan outstandings recorded in non-financial corporations' liabilities**

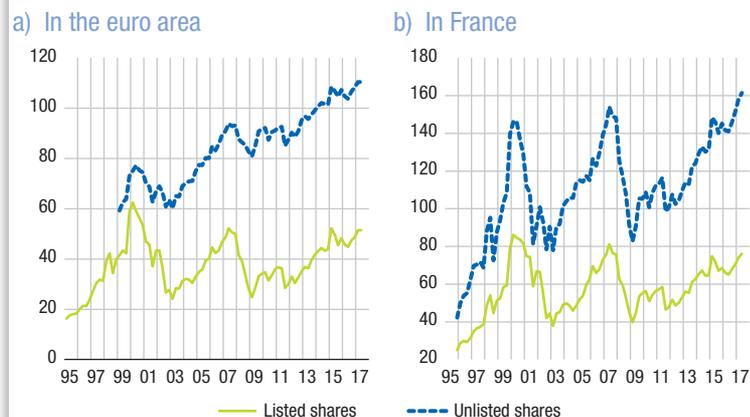
(as a % of GDP in value terms)



Sources: Datastream, Banque de France, Insee, Natixis and ECB.

**C13 Outstanding amount of shares in non-financial corporations' liabilities**

(as a % of GDP in value terms)



Sources: Datastream, Banque de France, Insee, Natixis and ECB.

Together with the rise in the self-financing ratio, disintermediation accelerates the decline in the role played by banks in financing companies.

## 213 The major role of private equity

Chart 5 above and Charts 13a and 13b show the rapid rise in the outstanding amount of unlisted shares in corporate financing.

The increasing role of private equity reveals both the weakness of savings invested in listed shares in the euro area or in France (Charts 14a and 14b),

**C14 Outstanding amount of listed shares held by households and institutional investors**

(as a % of GDP in value terms)



Sources: Datastream, ECB, Banque de France and Natixis.

and companies' growing distrust vis-à-vis stock markets, with the excessive price variations and the series of bubbles that exploded.

**3I What problems do these developments pose?**

**3I1 The transition towards a model where companies entirely self-finance their investments and no longer need external financing calls into question the very existence of finance**

What is the purpose of complex financial markets and banks if their only role is to finance governments, if financial analysis boils down to that of government solvency?

In addition, as banks increasingly lend to governments, they will diversify their risks less and less, which will lead to a strong correlation between sovereign risk and banking risk (see CDS – credit default swaps – in Charts 15a and 15b), which is precisely what we are trying to avoid in order to prevent a spiral of public finance crises and bank crises.

The effectiveness of monetary policy is probably also reduced. Interest rate variations no longer directly influence the cost of corporate financing. It indirectly influences the level chosen by companies for the weighted average cost of capital (WACC), which can be somewhat decorrelated from market interest rates.

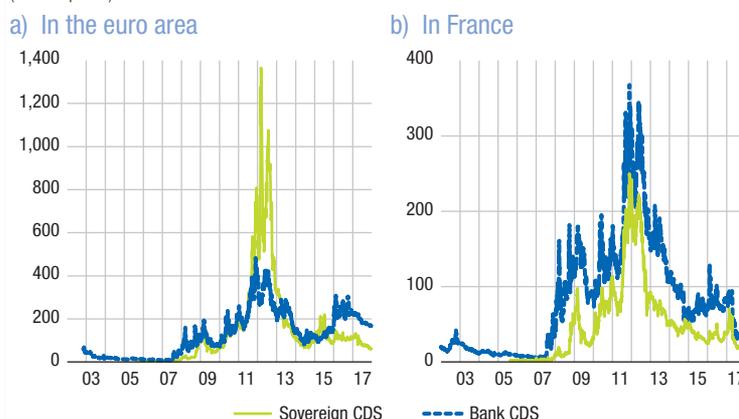
**3I2 In fact, disintermediation had begun before the crisis with the securitisation of bank loans which turned them into financial assets**

Table 2 shows the total outstanding amount of securitisations in the euro area.

The switch from bank financing to market financing has many consequences; it is procyclical, since

**C15 Sovereign CDS and bank CDS (5 years)**

(in basis points)



Sources: Datastream and Natixis.

**T2 Euro area: total outstanding amount of securitisations**

(EUR billions)

	ABS <sup>a)</sup>	CDO/CLO	CMBS	RMBS	SME	WBS/PFI	Total
1999	17.7	5.8	2.8	29.9	7.0	0.3	63.6
2000	22.1	7.9	4.6	48.3	6.8	0.4	90.1
2001	42.8	8.4	7.8	75.5	13.5	0.4	148.4
2002	58.2	8.5	11.2	115.2	16.3	0.9	210.5
2003	71.5	12.3	12.7	167.9	21.4	2.4	288.2
2004	88.8	15.8	13.8	198.5	28.8	2.4	348.2
2005	101.8	15.6	21.8	252.2	48.0	2.3	441.8
2006	124.1	15.0	36.7	329.6	67.1	2.4	574.9
2007	135.1	15.8	44.4	500.0	110.7	2.0	808.1
2008	160.8	47.8	41.2	802.4	134.5	2.0	1,188.5
2009	181.4	19.0	39.3	881.9	155.9	1.9	1,279.4
2010	164.5	30.8	43.0	866.2	160.5	2.0	1,266.9
2011	170.7	23.1	38.1	815.7	172.7	2.0	1,222.2
2012	163.7	18.1	31.9	704.6	146.6	2.0	1,066.9
2013	163.0	11.9	26.4	627.1	118.5	2.0	948.9
2014	153.2	5.8	20.7	636.7	102.9	1.4	920.8
2015	153.6	4.8	17.9	589.7	92.6	1.4	860.0
2016	162.9	4.5	12.4	564.7	82.0	0.9	827.5
2017 Q1	159.0	4.4	11.2	560.8	79.2	0.9	815.4
2017 Q2	155.4	3.2	10.0	557.9	79.0	0.9	806.4
2017 Q3	155.8	1.7	9.5	543.4	73.9	0.9	785.1

Sources: Securities Industry and Financial Markets Association (SIFMA) and Natixis.

Notes: ABS : asset-backed securities.

CDO/CLO: collateralised debt obligation/collateralised loan obligation.

CMBS: collateralised mortgage-backed securities.

RMBS: residential mortgage-backed securities.

SME: small and medium-sized enterprise.

WBS/PFI: whole business securities/project finance initiatives.

a) Auto loans, consumer loans, credit cards, leases, and other loans.

## C16 Risk premiums

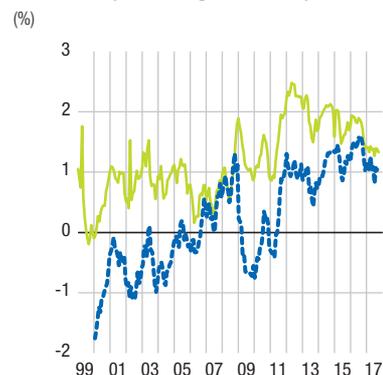
a) Euro area: Investment grade credit spread<sup>a)</sup>



b) Euro area: High yield credit spread



c) Interest rate margins on fixed-rate loans to companies against swaps



Sources: Datastream, Insee and Natixis.  
a) AAA+, AA+, A+ and BBB.

companies' bond markets close to a greater extent than bank credit markets during crises, as evidenced by changes in risk premiums (Charts 16a/16b/16c).

The risk of losing the ability to obtain external financing during recessions requires a high degree of labour market flexibility since companies must be able to quickly reduce their production costs

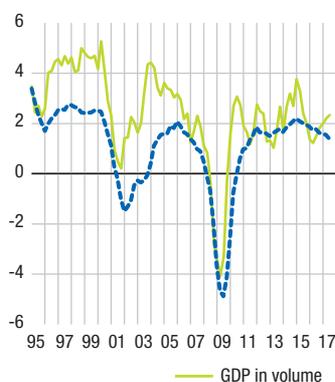
and their financing needs. The United States is thus far more able to adjust employment rapidly than the euro area or France (Charts 17a and 17b).

The other problem posed by disintermediation is that of risk allocation. Banks protect depositors against business risks (they absorb shocks through their funds and diversify risks); financial markets pass on risks directly to savers.

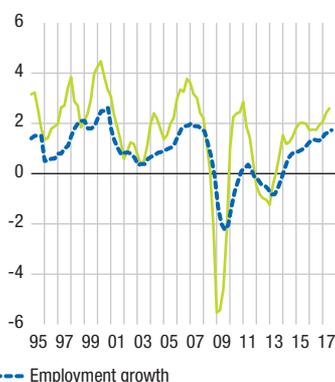
## C17 GDP and employment growth

(year-on-year % change)

a) In the United States



b) In the euro area



Sources: Datastream, BEA, BLS, Eurostat, ECB and Natixis.

Disintermediation then supposes that households, in the euro area and in France, are ready to accept to hold more risky assets (corporate securities instead of bank deposits), directly or indirectly through institutional investors. This is only true, of course, if companies do not fully self-finance their investments, in which case they do not need household savings.

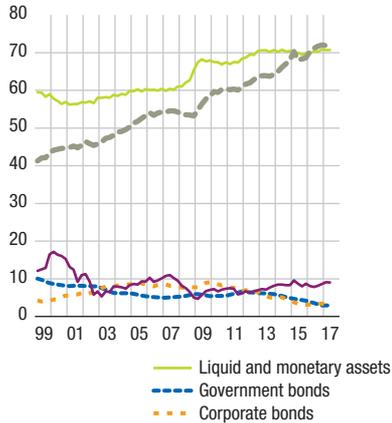
This is not at all clear, as the composition of the portfolios of households and institutional investors in the euro area highlights their strong risk aversion (Charts 18a and 18b, Charts 19a and 19b), with a high level of liquidity and government debts.

Regulatory constraints (Solvency II) are also pushing institutional investors in this direction.

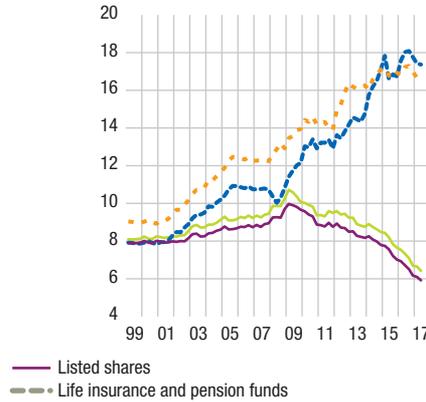
**C18 Outstanding amount of assets held in the euro area**

(as a % of GDP in value terms)

**a) By households**



**b) By institutional investors**

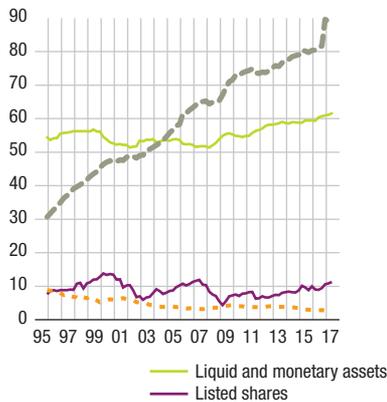


Sources: Datastream, ECB and Natixis.

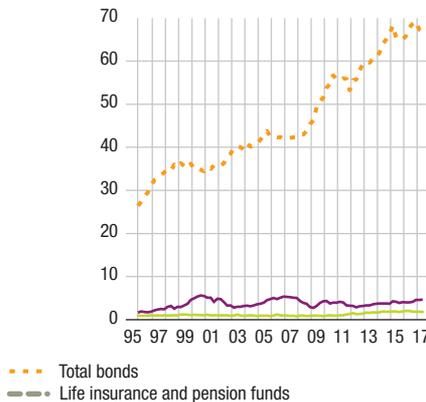
**C19 Assets held in France**

(as a % of GDP in value terms)

**a) By households**



**b) By institutional investors**



Sources: Datastream, Banque de France, Insee and Natixis.

**3I3 The significant and growing role of private equity further reduces the role of financial markets.**

better results in terms of improving corporate management than the incentives coming from financial markets.

This raises questions related to corporate governance: the incentives put in place by the shareholders of unlisted companies produce

Is the time horizon of shareholders and managers of unlisted companies longer than that of financial markets?

A number of studies analyse the performance of companies owned by private equity funds. These studies<sup>2</sup> most often show that companies held by private equity funds display a strong performance in terms of growth, research, development of new products, as well as investment drive during recessions. As regards employment, a Schumpeterian process is at work, transforming jobs into more productive jobs with a slightly negative net effect on its level.

Criticisms are levelled at the high costs of private equity<sup>3</sup> (fees, carried interest) and the inefficiently high leverage of LBO (leveraged buy-out) companies.<sup>4</sup>

Some studies<sup>5</sup> also highlight the fact that if companies are no longer listed, the link between citizens' income and corporate profits is broken, which reduces the incentive to pursue business-friendly policies.

- financial markets, despite the disintermediation of corporate financing, are also increasingly financing governments;
- private equity is playing a growing role;
- households must hold more risky assets and less bank deposits.

As we have seen, this organisation can pose many problems:

- the correlation between sovereign risk and banking risk;
- the reduced usefulness of finance;
- higher risk premiums if households do not wish to hold more risky assets.

It is clear that companies are increasingly refusing to depend on banks and the situation of financial markets, hence the growing role of self-financing and private equity. The company of the future would be a family business or a company owned by a private equity fund and that self-finances its investments (it is therefore not at all an LBO company).

In this model of the future, finance can only consist of banks lending to households and mutual funds invested in government bonds.

## 4I Conclusion: are we heading towards radically different finance?

It is clear from the above that finance is heading towards an organisation where:

- banks finance households (real estate loans, consumer loans) and governments, and no longer businesses;

<sup>2</sup> See Harris, Jenkinson and Kaplan (2012), Davis, Haltiwanger, Jarmin, Lerner and Miranda (2011), Link, Ruhm and Siegel (2012), AFIC (2017), Ferreira, Manso and Silva (2010).

<sup>3</sup> See Sorensen, Wang and Yang (2013).

<sup>4</sup> See Axelson, Jenkinson, Strömberg and Weisbach (2012).

<sup>5</sup> See Ljungqvist, Persson and Tåg (2016).

## References

**AFIC (2017)**

“*Croissance et création d’emplois dans les entreprises accompagnées par les acteurs français du capital-investissement*”, *AFIC études*, December, in French.

**Axelson (U.), Jenkinson (T.), Strömberg (P.) and Weisbach (M.) (2012)**

“Borrow cheap, buy high? The determinants of leverage and pricing in buyouts”, *CEPR Discussion Paper*, No. 8914, April.

**Bacchetta (P.) and Benhima (K.) (2015)**

“The demand of liquid assets, corporate saving and global imbalances”, *Journal of the European Economic Association*, Vol. 13, No. 6, pp. 1001-1035.

**Bernstein (S.), Lerner (J.) and Mezzanotti (F.) (2017)**

“Private equity and financial fragility during the crisis”, *NBER Working paper*, No. 23626, July.

**Chen (P.), Karabarbounis (L.) and Neiman (B.) (2017)**

“The global rise of corporate saving”, *NBER Working Paper*, No. 23133, March.

**Davis (S.), Haltiwanger (J.), Jarmin (R.), Lerner (J.) and Miranda (J.) (2011)**

“Private equity and employment”, *NBER Working Paper*, No. 17399, September.

**Ferreira (D.), Manso (G.) and Silva (A.) (2010)**

“Incentives to innovate and the decision to go public or private”, *CEPR Discussion Paper*, No. 7750, March.

**Gruber (J.) and Kamin (S.) (2016)**

“The corporate saving glut and falloff of investment spending in OECD Economies”, *IMF Economic Review*, Vol. 64, No. 4, pp. 777-799.

**Harris (R.), Jenkinson (T.) and Kaplan (S.) (2012)**

“Private equity performance: what do we know?”, *NBER Working paper*, No. 17874, February.

**Link (A.), Ruhm (C.) and Siegel (D.) (2012)**

“Private equity and the innovation strategies of entrepreneurial firms: empirical evidence from the small business innovation research program”, *NBER Working Paper*, No. 18297, August.

**Ljungqvist (A.), Persson (L.) and Tåg (J.) (2016)**

“Private equity’s unintended dark side: on the economic consequences of excessive delistings”, *CEPR Discussion Paper*, No. 11075, January.

**Sorensen (M.), Wang (N.) and Yang (J.) (2013)**

“Valuing private equity”, *NBER Working Paper*, No. 19612, November.



# **Regulatory responses to the risks of shadow banking**



# What risks do exchange-traded funds pose?

*There has been remarkable growth in the exchange-traded fund (ETF) market over the past decade. For many investors in equities and bonds, ETFs have become a preferred investment vehicle, providing low-cost exposure to diversified portfolios through the tracking of an index, while also allowing frequent on-market trading. Notwithstanding these clear benefits to investors, ETFs may pose some market risks. Among the main risks is that heavy trading of ETFs adds to co-movement and volatility in security prices. Price dynamics in periods of stress could also be affected by investor expectations about continued high liquidity or possible impairment of the ETF primary-secondary market trading mechanism. Risks may become more acute if complex ETF structures were to grow to a bigger share of activity.*

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## What risks do exchange-traded funds pose?

Grant Turner and Vladyslav Sushko

Over recent years ETFs have become an important part of many investment strategies. ETFs offer low cost options for investing in and trading diversified portfolios. Their strategy of tracking the returns of a specified price index (that is, “passive investing”) has gained favour with investors over recent years, displacing higher cost active investment strategies that aim to deliver returns above their benchmark through security selection and market timing (Sushko and Turner, 2018a).<sup>1</sup> Relative to other index tracking funds – index mutual funds – ETFs have been particularly attractive to investors because of their high tradability and near-immediate liquidity, features that are facilitated by ETF’s unique primary-secondary market trading mechanism.

and liquidity risks, particularly in times of stress, and collateral and counterparty risks associated with synthetic ETFs and securities lending by ETFs.

### 11 An overview of recent growth in the ETF industry

The ETF industry has expanded rapidly over recent years and become a prominent part of the global investment landscape. Data from Lipper indicate that as at September 2017, global assets of ETFs were roughly USD 4 trillion, or around 8.5% of total investment fund assets, up from around 2.5% a decade earlier. Similarly, the number of ETFs globally has ballooned to nearly 6,000 (see Charts 1a and 1b).

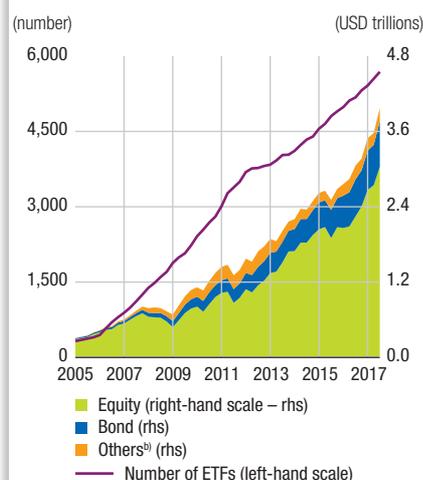
Cumulative net inflows into ETFs over the period were around USD 3.5 trillion, and partly came at the expense of “active” mutual funds, which experienced prolonged bouts of outflows (see Chart 1c). ETF inflows also clearly outsize

<sup>1</sup> A small share of ETFs accounting for about 2% of ETF assets do not seek to track an index, but rather offer investors an active investment strategy designed to deliver absolute returns or high returns relative to a benchmark.

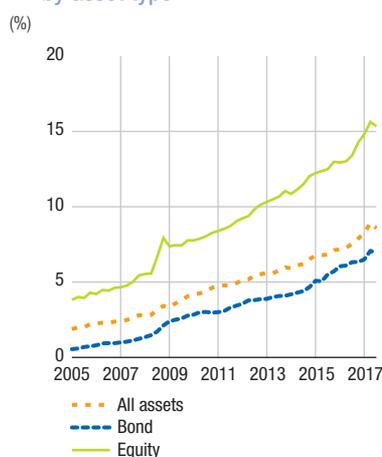
This article starts with an overview of growth in the global ETF market and key features and benefits of ETFs. It then considers a number of risks to investors and securities markets posed by ETF structures. These include the possibility that ETF structures contribute to market volatility

#### C1 The ETF market<sup>a)</sup>

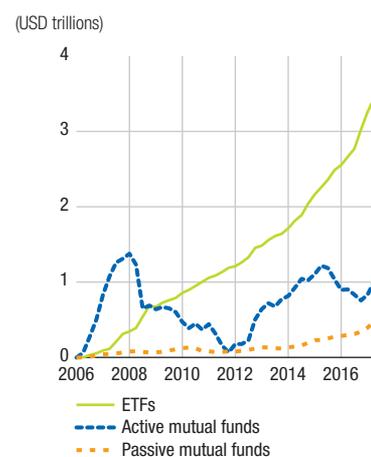
##### a) ETF market size



##### b) ETF share of investment fund assets, by asset type



##### c) ETF cumulative net flows



Sources: Lipper; BIS calculations.

a) Data as of end September 2017.

b) Others include alternatives, commodity, mixed assets, money market and real estate.

those into index mutual funds, despite these funds also offering low fee diversified investment products that have been increasingly favoured by investors.

Equities are the predominant asset class for ETFs, representing around two-thirds of aggregate ETF assets. Much of the remaining assets are invested in bond ETFs, with only a small share providing exposure to commodities or other types of assets.<sup>2</sup> The greater prevalence of ETF equity funds compared with that for bonds partly reflects the greater liquidity and exchange-traded nature of equities. In addition, constructing and tracking indices that follow equities is easier, while the high correlation of interest rates may make holding broad market index bond portfolios less attractive (Fender, 2003).

ETFs have grown considerably across the major advanced markets in Europe, the United States, Japan, as well as emerging market economies (EMEs) in aggregate. Gains have been largest in Japanese equities, where the ETF share has grown to half of all equity fund assets, supported by the Bank of Japan's equity ETF purchases and increased allocation towards equities of the Government Pension Investment Fund over recent years.

## 21 Key features and benefits of ETFs

ETFs seek to replicate or otherwise closely track the returns of a specified price index, often an established market benchmark. In this respect, ETFs are comparable to index mutual funds.<sup>3</sup> Index investment strategies are typically diversified, and have low operating expenses because the fund manager does not seek to outperform the benchmark and hence need not engage in the (costly) production or acquisition of fundamental security-level information.

The key innovation of ETFs is a trading process that combines characteristics of both open-end and closed-end funds. Variation in the number of ETF units arising from inflows or redemptions resembles the design of open-end mutual funds,

while the ability to trade ETF shares throughout the day on a secondary market at a transparent price is a feature shared by closed-end funds.

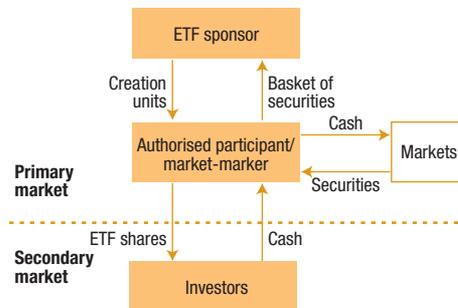
ETF trading is facilitated by designated market-makers, which have the obligation to provide liquidity in the secondary market for ETF shares by providing bid and offer prices for the ETF. The proximity of the secondary-market price of ETF shares to the net asset value (NAV) is predicated on arbitrage by registered intermediaries known as authorised participants (APs), typically broker-dealers, many of whom may also function as market-makers. APs may trade the ETF shares on the secondary market like other investors, but they can also create and redeem ETF shares (known as "creation units") in the primary market directly with the ETF sponsor at the current NAV in the portfolio (see Chart 2a). The ability of APs to

2 The asset-level statistics mask growing diversity in ETF offerings. There has been a proliferation of ETFs that depart from traditional diversified market capitalisation benchmarks: some ETFs track more granular indices (e.g., sectoral equity ETFs, high yield bonds), while others termed "smart beta ETFs" implement factor-weighting strategies, such as those based on dividend yield and volatility factors.

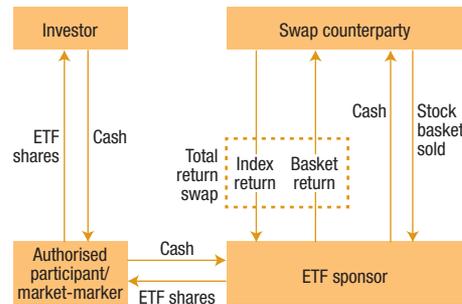
3 In the United States, almost all ETF open-ended funds are classified as unit investment trusts, but are not considered to be mutual funds because of the limited redeemability of ETF shares. In Europe, this distinction is not made and ETFs can be established under the undertakings for collective investments in transferable securities (UCITS) similar to those for mutual funds.

### C2 Mechanics of share creation process

#### a) For a physical ETF



#### b) For a swap-based synthetic ETF<sup>a)</sup>



Source: Ramaswamy (2011).

a) Unfunded swap structure.

transact in both the primary and secondary markets incentivises profitable arbitrage of the ETF share price and the underlying assets. For example, in the case of a material decline in the price of ETF shares below the value of the underlying assets, APs could purchase ETF shares and redeem these with the ETF sponsor in exchange for the underlying securities, which they then may sell on the market. However, unlike the designated market-makers who have an obligation to the exchange, APs are not obligated to continuously trade. Indeed, only a fraction of eligible APs appear to be exercising the ETF arbitrage function on a regular basis (see below).

Other market participants, such as proprietary trading firms (PTFs), may also act to minimise the deviation of the ETF share price from the NAV by taking long and short positions in the secondary ETF market and the market for the underlying securities. However, such trades cannot be considered to be pure, riskless arbitrage because the discrepancy between the value of ETF shares and the underlying securities could widen over a given period, rather than narrow as expected (Ben-David et al., 2017).

ETF arbitrage by APs and other market participants underpins a key value proposition of ETFs for investors – near-immediate liquidity at a share price close to the value of assets underlying the price index. This can be contrasted with open-end mutual funds, where investors buy or redeem units directly with the fund and receive security prices (usually those at the close of the trading day) that were not observable at the time of the transaction.

There are several other features of ETFs that investors may deem beneficial. First, ETF portfolios tend to be relatively transparent, with many ETF providers publishing their securities basket on a daily basis. Second, ETFs exhibit low transaction costs compared with trading of the underlying assets, in large part because portfolio trading by APs allows tighter bid-ask spreads and the netting of investor trades (see Chart 3a). Third, ETFs are more tax efficient

and equitable compared with mutual funds. ETF investors can exit their position by selling to another investor in the secondary market; this transaction need not generate trading of the underlying security portfolio, and thus need not affect the value of holdings of remaining investors. Fourth, where ETFs are listed on an exchange, market participants can place market, limit or stop orders for shares. Short sales of ETF shares are also possible, which may be an attractive feature for investors that are seeking to hedge an existing market exposure.

An important aspect of ETF design is the approach used to track the performance of the benchmark index. ETFs usually do so by physically holding the constituent securities of the benchmark index at their portfolio weights (or otherwise a basket of securities that closely replicates the return of the portfolio). “Synthetic ETFs” instead replicate the returns on an index using derivatives. The most common structure is an unfunded total return swap (see Chart 2b). Under this structure, the ETF issues new shares to the AP and is paid in cash, rather than an “in-kind” transaction involving a basket of securities. The ETF uses the cash to buy a basket of securities to be placed as collateral with a swap counterparty. The swap counterparty pays the return of the reference index to the ETF issuer. In exchange, the counterparty receives the returns of the securities basket.<sup>4</sup> Synthetic ETFs can allow investors to gain exposure to some assets where physical tracking is not practical or feasible. They may also allow better replication of index returns, and thus offer investors lower tracking error compared with ETFs that seek to physically replicate an index. However, they do present specific counterparty and collateral risks to investors (see below).

### 3I Implications for market pricing and liquidity

Key structural features of ETFs – index tracking, the ability to trade a diversified portfolio throughout the day and the AP creation/redemption mechanism – could have particular implications for market

<sup>4</sup> A less common alternative structure is a funded total return swap. The main difference in a funded swap is that the ETF agrees to pay the swap counterparty an agreed funding (interest) rate in return for the guaranteed index return, and the swap counterparty backs the transaction by posting collateral in a custodian account. Unlike the unfunded structure, the ETF is not the beneficial owner of the collateral assets. For further details, see Ramaswamy (2011).

pricing, volatility and liquidity. How market pricing is affected by ETFs will depend on the liquidity properties of the underlying assets, investor expectations and the willingness and capacity of APs to intermediate between the primary and secondary ETF markets. Certain exotic ETF products, albeit relatively small in scale at the current juncture, have the potential for a disproportionate impact on market pricing should they grow materially.

### 3I1 ETF trading and underlying security prices

In principle, fluctuations in the demand for ETF shares in the secondary market may be transmitted to the underlying security price through arbitrage by APs and other market participants. Conversely, a demand shock to the underlying assets may be transferred to the ETF shares through arbitrage.

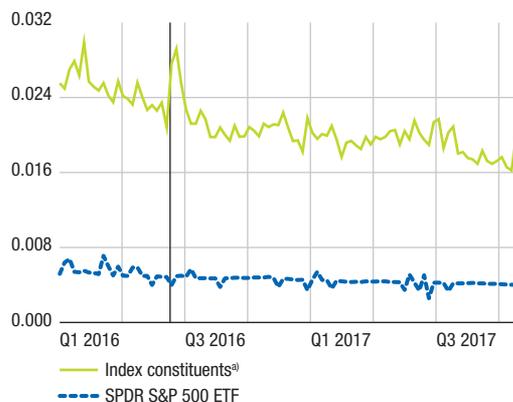
The ability to frequently trade ETF shares at low cost is likely to be an attractive feature for investors with short-term horizons, such as high frequency traders or

investors seeking to dynamically hedge their market exposure. If so, it follows that ETFs could induce buying or selling of the underlying asset for reasons unrelated to the asset's fundamentals. Consistent with this, some studies (see Baltussen et al., 2017; Ben-David et al., 2014; Krause et al., 2014) link ETF ownership of stocks or ETF share trading with non-fundamental shocks to the underlying asset (i.e. greater volatility). The ETF creation/redemption mechanism itself has been shown to be one possible channel through which temporary demand shocks can exert long-lasting effects on securities prices (Malamud, 2015). ETFs have also been found to contribute to the co-movement of securities within an index, given the trading of ETF shares can entail the buying and selling of the underlying securities as a portfolio (Da and Shive, 2018; Israeli et al., 2017; Leippold et al., 2016). At an aggregate level, shifts in the demand for ETFs could exacerbate existing price trends. For example, market-value weighting of indices means that there is a tendency for overvalued stocks or bonds to find their way into indices relative to undervalued securities (Committee on the Global Financial System – CGFS, 2003).

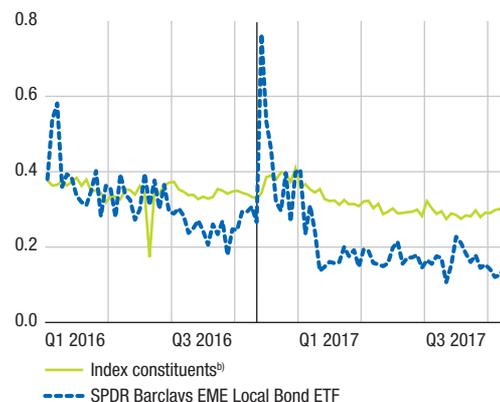
## C3 Bid-ask spreads: ETFs vs. benchmark index constituents

(as a % of mid-price; weekly averages)

### a) US equities



### b) EME local currency bonds



Sources: State Street Global Advisors SPDR, Thomson Reuters Eikon; BIS calculations.

Note: The vertical lines indicate the UK referendum on 23 June 2016 (Chart 3a) and the US presidential election on 9 November 2016 (Chart 3b).

a) S&P 500 index constituents market capitalisation weighted, as of 31 October 2017.

b) Barclays Emerging Markets Local Currency Liquid Government Index constituents, weighted by holdings of SPDR Barclays Emerging Markets Local Bond UCITS ETF, as of 30 October 2017.

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That said, it is important to bear in mind that despite high trading volumes in the secondary ETF markets, the vast majority of ETFs do not exhibit share creation/redemption on a daily basis in the primary market, suggesting that ETF trading often clears in the secondary market without necessarily generating trading in the underlying securities (ICI, 2015). And for illiquid asset classes, relatively frequent ETF trading of ETF shares could even aid price discovery:<sup>5</sup> share price deviations from net asset value for certain bond ETFs might provide the best indication of the true market value, given that infrequent trading in bond markets can make it difficult to obtain a reliable market price. For example, the reaction of the trading costs of an EME bond ETF to the outcome of the 2016 US presidential election was bigger and more immediate than that of the underlying securities (see Chart 3b), indicating that it was the ETF that priced-in the broader fixed-income sell-off which subsequently followed.

### 3I2 Liquidity in times of stress

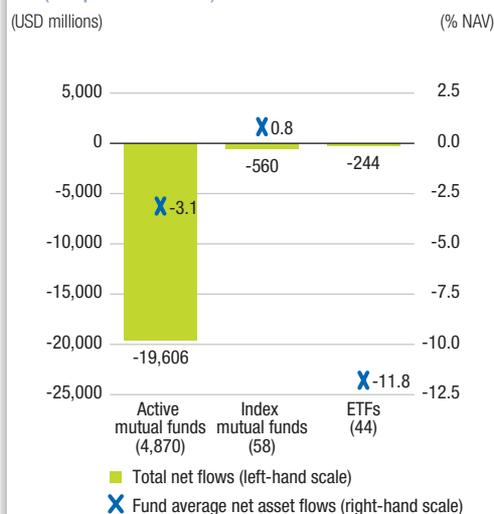
The impact of ETF trading on security prices could be more pronounced during times of market stress, as this is when demand for liquidity typically surges. In these circumstances, the liquidity expectations of some ETF investors might be unrealistically high, particularly if they were attracted to readily available ETF liquidity in normal times. Arguably, such “liquidity illusion” is more likely when the underlying securities are relatively illiquid – for example, corporate bonds.

There is some evidence that during stress periods investors in some bond ETFs can be more “flighty” compared to traditional mutual funds. Indeed, EME bond ETF outflows during the 2013 “taper tantrum”, although relatively small in absolute terms, were significantly larger compared to active and index mutual funds when controlling for fund size (see Chart 4a).

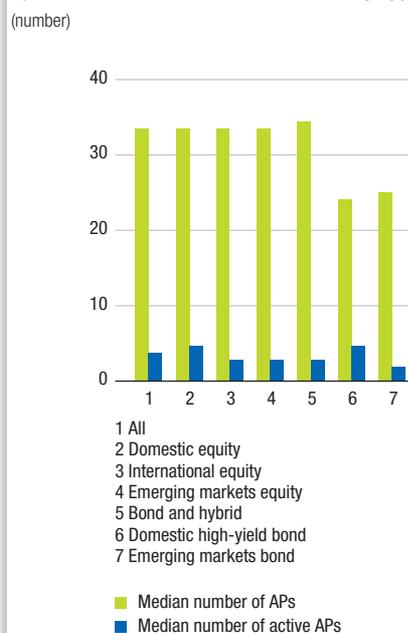
<sup>5</sup> In addition, ETFs could aid price discovery when equity markets are not trading. For example, ETF shares trading in the United States when some EME markets are closed.

## C4 ETF EME-focused bond fund flows and ETF authorised participants

### a) EME bond funds, net flows, June 2013 (“Taper tantrum”)<sup>a)</sup>



### b) Median number of APs in ETFs by type



Sources: Investment Company Institute (ICI) and Lipper; BIS calculations.  
a) Number of unique funds in parentheses.

In considering the implications of excess selling of ETF shares by investors, it is useful to distinguish between the liquidity characteristics of mutual funds versus ETFs. Open-end mutual funds offer short-term liquidity (often end-of-day) at the prevailing NAV. Investor redemptions are usually met by selling security holdings, although these funds could first draw down any cash/liquid asset buffers. In some cases, investor redemptions can be subject to a first-mover advantage – that is, the liquidity costs of redeeming investors are borne by remaining mutual unit holders.<sup>6</sup> In contrast, while ETFs offer investors greater immediacy, there is no implicit insurance offered against liquidity risk and in a distressed market investors would probably need to accept a discounted ETF share price relative to NAV.<sup>7</sup> Another relevant distinction is that sales of ETF shares by investors need not generate sales of the underlying securities. This is because designated market-makers can accommodate ETF selling and APs can arbitrage ETF share price discounts by making in-kind transactions with the ETF sponsor and warehousing the underlying assets that they receive.

The potential for the ETF intermediation process by APs to become impaired – resulting in substantial ETF share price deviations from the NAV – is therefore a central aspect of the assessment of liquidity risks posed by ETFs. A lack of reliable price information about the underlying assets (or trading halts) in times of market stress might discourage APs from engaging in ETF share creation/redemption. The impact could be exacerbated if accompanied by a breakdown of secondary market arbitrage by PTFs. In times of stress, there is also a greater likelihood of APs halting ETF arbitrage because of their balance sheet constraints and reduced risk-bearing capacity. In particular, APs are required to post cash collateral in order to create/redeem shares of certain ETF structures, exposing the arbitrage process to broader priorities about AP balance sheet usage and possible cash constraints in stressed conditions.

The AP process for corporate bond ETFs could involve additional frictions. APs typically have a dual role as ETF arbitrageurs and as bond dealers in the market for the underlying asset. Under certain conditions, APs' inventory management motives can dominate – that is, they use ETF creation/redemption to manage their inventory risks rather than to close relative mispricing (Pan and Zeng, 2017). For example, if APs have large negative bond inventory imbalances when ETFs are trading at a premium, and the underlying bond market is hampered by low liquidity, then APs may find it optimal to redeem ETF shares in order to close their negative corporate bond inventory position. That is, instead of buying the underlying bonds and exchanging them with the ETF provider to create ETF shares, as ETF arbitrage would prescribe.

Complicating the risk-assessment of AP arbitrage is the fact that only a fraction of registered APs tend to be actively providing liquidity, with numbers typically lower for bond ETFs (see Chart 4b). Moreover, as APs typically service multiple ETFs, a large number of funds could be affected simultaneously. However, these scenarios assume that no other APs are willing and able to step in to facilitate the creation/redemption process to keep the ETF primary market functioning. The few instances of major AP pullback so far suggest otherwise.<sup>8</sup> From this perspective, a complete breakdown of AP mechanisms seems unlikely unless markets are already experiencing a systemic event. In that case, investors could still access the secondary market where ETFs would be temporarily trading as closed-end funds, while the transmission of price changes to those of the underlying securities would be more limited.

### 313 Complex ETF strategies

Several more complex ETF products that have grown in size could encourage speculative investing and may have a disproportionate impact on securities market volatility. Leveraged ETFs use structured products, such as total return swaps

6 More generally, it can be difficult for open-end mutual fund investors to internalise the impact of their redemptions on unit prices and underlying asset liquidity, because they are not able to update their expectations due to a lack of intra-day trading in the fund shares (Lewrick and Schanz, 2017).

7 In some European markets the deviation in ETF shares from the net asset value is limited, with trading being suspended when a threshold is reached.

8 For example, other APs saw an opportunity and stepped in when a technological error forced Knight Trading Group, one of the largest US equity and fixed income ETF liquidity providers, to pull back from ETF creation/redemption on 1 August 2012. Similarly, a major AP stepped in for Citigroup on 20 June 2013, when the latter stopped transmitting redemption orders because it had reached its internal net capital ceiling for counterparty exposure (ICI, 2015).

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or futures, to deliver multiples of exposure to a benchmark (that is, 2 or 3 times gains or losses, see Chart 5a). For example, a 2x daily S&P 500 ETF with USD 200 million in assets could amplify its return by holding a USD 400 million notional position in S&P 500 futures. Inverse ETFs use structured derivatives, most commonly total return swaps, to achieve a short exposure, allowing investors to hedge their market exposure or profit from speculation on a market fall. Some funds even combine leverage and inverse strategies to deliver a multiple short exposure.

To maintain their target leverage, most leveraged and inverse ETFs rebalance their index portfolio on a daily basis in a self-reinforcing way: buying when prices are rising and selling when prices are falling. Such positive-feedback rebalancing, combined with the use of futures and swaps makes leveraged ETFs resemble portfolio insurance strategies (Tuzun, 2013). Daily rebalancing is

concentrated in the last hour of the trading day, which could generate destabilising end-of-day pressures on the underlying asset markets, as well as the markets for derivatives used in daily re-leveraging.<sup>9</sup>

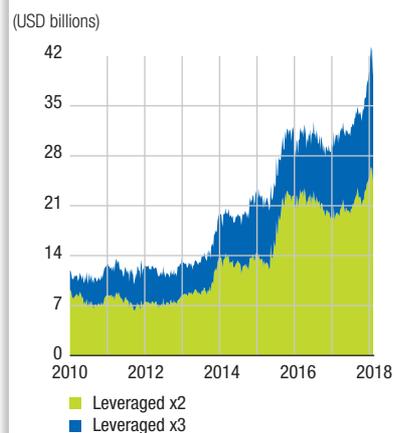
Leveraged equity ETFs represent only a small share of the ETF market, roughly 1% of all ETF assets at June 2017. However, because of their leveraged nature, any effects of these products on other markets are multiplied. In fact, relative to their activity, trading volumes of leveraged equity ETFs are usually considerably larger than vanilla ETFs (see Chart 5b).

From an investor perspective, there is also a question as to whether these products are suitable for retail investors, given their complexity and higher risk. The fact that tracking error can rise markedly after even one day means that these products are more suitable for very short-horizon investors.

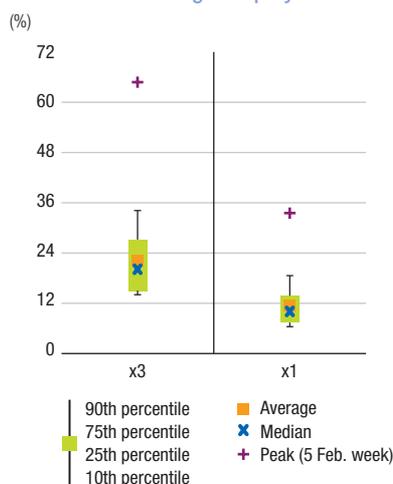
<sup>9</sup> On a number of occasions since 2015, a sponsor of a large leveraged ETF (the Next Funds Nikkei 225 Leveraged Index ETF) had to suspend the primary market activity in its shares because the futures market could not absorb the volume of orders associated with the fund's end-of-day rebalancing.

### C5 Leveraged ETFs and volatility ETPs

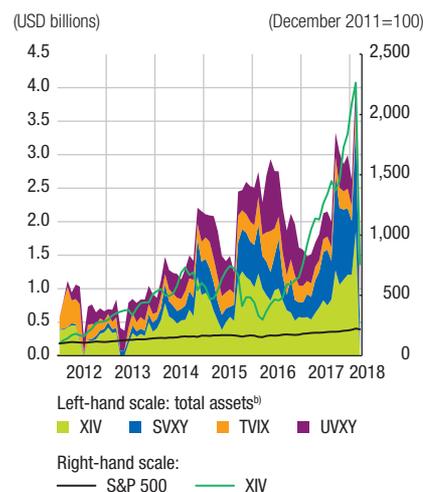
#### a) Leveraged equity ETFs



#### b) Trading of leveraged and non-leveraged equity ETFs<sup>a)</sup>



#### c) Volatility ETPs<sup>b)</sup>



Sources: US Commodity Futures Trading Commission – CFTC, Bloomberg, EPFR; BIS calculations.

a) Daily traded dollar volume (turnover) divided by total assets; 2015–2017. Equity x1 is the US SPDR S&P500, equity x3 is the ProShares UltraPro S&P500.

b) XIV VelocityShares Daily Inverse VIX Short-Term ETN (short vol / short term), SVXY ProShares Short VIX Short-Term Futures (short vol / short term), TVIX VelocityShares Daily 2x VIX Short Term ETN (leveraged long vol / short term), UVXY ProShares Ultra VIX Short-Term Futures (leveraged long vol / short term).

The use of inverse and leverage strategies has been particularly popular with recently expanding volatility exchange-traded<sup>10</sup> products (ETPs; see Chart 5c). The transformation of the VIX from a pure index to the price of a traded instrument with the emergence of VIX futures has attracted large capital inflows into VIX futures markets through the expansion of ETPs. It appears that large end-of-day rebalancing in VIX futures by such ETPs contributed to the snap-back in the VIX and exacerbated the recent equity market<sup>11</sup> sell-off on 5 February 2018.

#### 4I Counterparty and collateral risks

Like other investment vehicles that use derivatives or engage in securities lending, ETFs are exposed to the risk that a counterparty fails to fulfil its obligation.

##### 4I1 Swap counterparties in synthetic ETFs

Investors in synthetic ETFs are exposed to the risk that the swap counterparty cannot fulfil its index return obligation, which would require the ETF to secure a replacement swap. If the ETF is unable to do so, it could liquidate its collateral basket and then physically purchase the basket of underlying securities. A broad decline in investor confidence in the ETF market could ensue if the impaired swap counterparty services multiple ETFs.

A further risk to investors arises when the market value of collateral is insufficient to cover losses in the event that the counterparty fails.<sup>12</sup> From a system-wide perspective, the default of a swap counterparty may force the ETF to quickly sell their collateral, and thus exert downward pressure on market prices for the collateral. For collateral that is illiquid or of poorer credit quality, an adverse shock to the collateral market could generate pre-emptive selling of ETF shares (Foucher and Gray 2014).<sup>13</sup>

Counterparty risks may also be posed by related-party swap transactions – that is, when the swap is sourced

from a financial intermediary that is affiliated with the ETF provider. The use of related-party transactions might reflect a desire by some banks to obtain funding for their illiquid portfolios, since there is no requirement that the collateral provided to the ETF matches the assets of the tracked index (FSB, 2011). Such synthetic ETF structures entail potential conflicts of interest, including the provision of the swap at non-economic terms (BlackRock, 2013). Related-party transactions are prohibited in the United States and are primarily a feature of European ETF markets. Even so, their use has been declining and, more generally, the total share of synthetic ETFs in Europe fell from around 45% in 2010 to around 23% in 2016 (Morningstar, 2017).

The majority of synthetic ETF providers fully collateralise or over-collateralise their swap exposure, thereby increasing the protection for investors. Using a sample of synthetic ETFs, Hurlin et al. (2017), document average over-collateralisation rates of around 8%. They also find that investors are compensated for bearing the risk through lower tracking error and lower fees of synthetic ETFs. Using more recent data, Aramonte et al. (2017), show that over-collateralisation levels decline more during times of market volatility for ETFs that use an affiliated swap counterparty, although the overall effect is small.

##### 4I2 Securities lending by physical ETFs

Physical ETFs that engage in securities lending are also exposed to collateral and counterparty risks. Securities lending occurs when a stock or bond is lent to a (financial) borrower for a specified period of time, in return for a compensating interest rate, with the transaction secured by the borrower posting collateral worth more than the lent securities. Like many managed funds, physical ETFs may engage in securities lending to generate additional revenue. For a sample of physical ETFs in 2012, Hurlin et al. (2017), find that 7.5% of collateral was lent out. The ratio of collateral lent out was much higher for government

10 The four products shown include exchange-traded funds (ETFs), which give investors exposure to market risk, as well as exchange-traded notes (ETNs), which are debt securities backed by the credit of the issuers, and expose investors to both market and credit risk.

11 For an analysis of the episode see Sushko and Turner (2018b).

12 In the case of the unfunded swap shown in Chart 2b above, the risk is rather that the return on the basket of securities obtained from the swap counterparty is below that of the index being tracked.

13 Another risk is that constraints on the posting of collateral by APs inhibits the ETF intermediation function, as occurred for Citigroup in 2013 (see footnote 6 above).

bond ETFs (17%) than corporate bond ETFs (6%), consistent with the greater use of relatively liquid government bonds in collateralised transactions and markets.

From a financial stability perspective, significant securities lending could generate a shortage in the market for the underlying securities if ETFs were to recall large amounts of securities from borrowers to meet redemptions (FSB, 2011). Still, it is possible that such risks could be effectively managed by ETF market practices. For example, BlackRock, the largest ETF provider globally, explains that in response to AP redemptions that exceed un-loaned securities in one of its ETFs, it would first re-allocate securities loans from other ETFs that have excess securities before recalling secured loans from the borrower (BlackRock, 2013).

## 51 Conclusion

The development and expansion of the ETF industry can be regarded as a positive force in financial markets, helping to drive down investment and trading costs, and to open up investment diversification options previously inaccessible to many investors. The development of the ETF industry in the future will be influenced by how investors and other market participants perceive and manage risks associated with ETFs. These include, but are not limited to, issues raised in this article, such as the awareness of the liquidity characteristics of ETFs and the specific risks posed by relatively complex ETF structures. Consideration of risks (and benefits) particular to ETFs is also important for public financial authorities in their monitoring activities and in their roles as financial market regulators.

## References

- Aramonte (S.), Caglio (C.) and Tuzun (T.) (2017)  
 “Synthetic ETFs”, *FEDS notes*, 10 August.
- Baltussen (G.), Zhi (D.) and van Bakkum (S.) (2017)  
 “Indexing and stock market serial dependence around the world”, *Journal of Financial Economics*, forthcoming.
- Ben-David (I.), Franzoni (F.) and Moussawi (R.) (2014)  
 “Do ETFs increase volatility?”, *NBER Working Paper*, No. 2007-1.
- Ben-David (I.), Franzoni (F.) and Moussawi (R.) (2017)  
 “Exchange-traded funds (ETFs)”, *Annual Review of Financial Economics*, Vol. 24, pp. 169-189.
- BlackRock (2013)  
 “ETPs: overview, benefits and myths”, *Viewpoint*.
- Committee on the Global Financial System (2003)  
 “Incentive structures in institutional asset management and their implications for financial markets”, *CGFS Papers*, No. 21.
- Da (Z.) and Shive (S.) (2018)  
 “ETFs and asset return correlations”, *European Financial Management*, Vol. 24, No. 1, January, pp. 136-168.
- Fender (I.) (2003)  
 “Institutional asset managers: industry trends, incentives and implications for market efficiency”, *BIS Quarterly Review*, September, pp. 75-86.
- Financial Stability Board (2011)  
*Potential financial stability risks from recent trends in exchange-traded funds (ETFs)*, 12 April.
- Foucher (I.) and Gray (K.) (2014)  
 “Exchange-traded funds: evolution of benefits, vulnerabilities and risks”, *Financial System Review*, Bank of Canada, December.
- Hurlin (C.), Iseli (G.), Pérignon (C.) and Yeung (S.) (2017)  
 “The counterparty risk exposure of ETF investors”, *HEC Paris Research Paper: <https://ssrn.com/abstract=2462747>*
- Investment Company Institute – ICI (2015)  
*The role and activities of authorized participants of exchange-traded funds*, March.
- Israeli (D.), Lee (C.) and Sridharan (S.) (2017)  
 “Is there a dark side to exchange-traded funds? An information perspective”, *Review of Accounting Studies*, Vol. 22, No. 3, pp. 1048-1083.
- Krause (T.), Ehsani (S.) and Lien (D.) (2014)  
 “Exchange-traded funds, liquidity and volatility”, *Applied Financial Economics*, Vol. 24, pp. 1617-1630.
- Leippold (M.), Su (L.) and Ziegler (A.) (2016)  
 “How index futures and ETFs affect stock returns”: <https://ssrn.com/abstract=2620955>
- Lewrick (U.) and Schanz (J.) (2017)  
 “Is the price right? Swing pricing and investor redemptions”, *BIS Working Papers*, No. 664.
- Malamud (S.) (2015)  
 “A dynamic equilibrium model of ETFs”, *Swiss Finance Institute Research Paper Series*, No. 15-37.
- Morningstar (2017)  
 “A guided tour of the European ETF marketplace”.
- Pan (K.) and Zeng (Y.) (2017)  
 “ETF arbitrage under liquidity mismatch”, *European Systemic Risk Board Working Paper*, No. 59, December.
- Ramaswamy (S.) (2011)  
 “Market structures and systemic risks of exchange-traded funds”, *BIS Working Papers*, No. 343.

## What risks do exchange-traded funds pose?

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### Sushko (V.) and Turner (G.) (2018a)

“The implications of passive investing for securities markets”, *BIS Quarterly Review*, March, pp. 113-131.

### Sushko (V.) and Turner (G.) (2018b)

“The equity market turbulence of 5 February – the role of exchange-traded volatility products”, *BIS Quarterly Review*, March, pp. 4-6.

### Tuzun (T.) (2013)

“Are leveraged and inverse ETFs the new portfolio insurers?”, *Finance and Economics Discussion Series*, Federal Reserve Board, July.

# Moving beyond the shadow banking concept

*A concept that emerged from the 2007-08 financial crisis, shadow banking has been a focus of regulatory attention for almost a decade. The need for a common definition has spawned a debate over terminology that mirrors the challenges involved in finding a catch-all term to cover such a wide spectrum of situations. If some commentators today prefer expressions such as “market-based finance” or “non-bank finance” that avoid the original term’s pejorative connotations, it is because there has been a paradigm shift since the crisis. After addressing most areas of “shadow banking”, from the transparency of repo and securities lending transactions to money market fund (MMF) reforms and securitisation rules, regulators are now turning to consider the effectiveness of regulation and are concentrating on identifying persistent areas of risk as well as emerging risks. Extending beyond the narrow definition of shadow banking, recent efforts to make the financial system more robust, as illustrated by the analysis of vulnerabilities in the asset management sector, highlight the need for a holistic risk-based approach that considers different sectors and areas of activity as a whole. How does this risk based approach play out in practice? And what are the main related challenges?*

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“Shadow banking” is defined in contrast to the traditional banking system. While it performs similar functions (i.e. credit intermediation) and generates the same risks (i.e. maturity and liquidity transformation, credit risk transfer and leverage), shadow banking differs from the regular system because of (i) its multifaceted nature and (ii) highly specific regulations, i.e. as distinct from prudential regulations. In the wake of the financial crisis and in a bid to capture the diversity and complexity of the shadow banking universe, the Financial Stability Board (FSB) created a specific methodological framework to establish a single global measure of the phenomenon. Seven years on, the framework remains relevant and helpful in understanding the different situations and complexities that exist across jurisdictions. However, it now needs to be refined to more effectively target risks and the initiatives required to contain them.

### 11 Shadow banking: a methodological framework

#### 111 A single measure of global shadow banking and an overall vision of risk

Alongside the push to regulate the banking sector in the aftermath of the 2007-08 financial crisis, the need to identify and regulate shadow banking also became apparent at international level. While this type of credit intermediation can help finance the real economy, it is also a potential source of systemic risk, especially when it is strongly interconnected with the regular banking system and structured to perform banking functions. For this reason, following calls by the G20 in 2011<sup>1</sup> to strengthen the regulation and oversight of shadow banking, the FSB began working with the Basel Committee, the International Organization of Securities Commissions (IOSCO) and other international standard-setters to address the challenges posed by shadow banking, including regulatory challenges and challenges connected with identifying and monitoring risks.

Several working groups were set up and assigned workstreams, including money market funds (MMFs), securitisation, repos and securities lending transactions, that reflected the decisive role that these financial activities and techniques played in the 2007-08 crisis as well as their presence in the financial system. Over and above the specific regulatory policy recommendations that came out of these efforts,<sup>2</sup> one of the FSB’s primary achievements was to publish, in August 2013,<sup>3</sup> a methodological framework to enable coordinated global identification of the shadow banking sector and the associated financial stability risks. To tackle the difficulties posed by the sector’s multifaceted and evolving nature, the FSB adopted an activity based (economic function-based) approach that concentrated on identifying areas of risk, rather than an entity-based (or legal form-based) approach, which would be intrinsically limited given the variety of terminologies in use around the world. Five economic functions (EFs) were defined: EF1, management of collective investment vehicles with features that make them susceptible to runs; EF2, loan provision that is dependent on short-term funding; EF3, intermediation of market activities that is dependent on short-term funding or on secured funding of client assets; EF4, facilitation of credit creation; and EF5, securitisation-based credit intermediation and funding of financial entities. The FSB also provided a menu of policy tools that national authorities could use to mitigate the shadow banking risks inherent in each of the economic functions.

Completion of this framework and refinements since 2013 have made it possible to obtain a global measure of shadow banking and a consolidated vision of associated risks, based on an annual FSB-led campaign to collect data from member jurisdictions. This “narrow” measure is calculated by excluding activities that do not fall within the scope of one of the five economic functions, either because they do not involve credit intermediation (e.g. equity

1 See G20 (2011).

2 See the IOSCO report on money market funds (2012b), the IOSCO report on securitisation (2012c) and the Basel Committee report on step-in risk (October 2017), etc.

3 See Financial Stability Board (2013).

funds and some real estate funds), or because some activities are consolidated (and therefore regulated) for prudential purposes (e.g. some investment firms, financial companies, broker-dealers, etc.). However, this measure does not take account of specific regulatory systems set up by individual jurisdictions to contain the risks inherent in shadow banking, such as, for example, restrictions on the use of leverage by certain funds (undertakings for collective investment in transferable securities – UCITS, mutual funds and tools to regulate liquidity risk management at some funds). This “pre-mitigant” approach makes it possible to avoid prejudging the effectiveness of one regulatory tool over another, thus ensuring a degree of neutrality when aggregating and comparing data across jurisdictions. Through this approach, which is prudent but also likely to overestimate the risks associated with certain activities, the FSB does however recognise that shadow banking can be regulated (and that regulatory discussions should focus on the adequacy of rules with regard to the identified risks). An appropriate future development would therefore be to supplement this approach with a “post-mitigant” measure that would allow authorities to focus on residual risk.

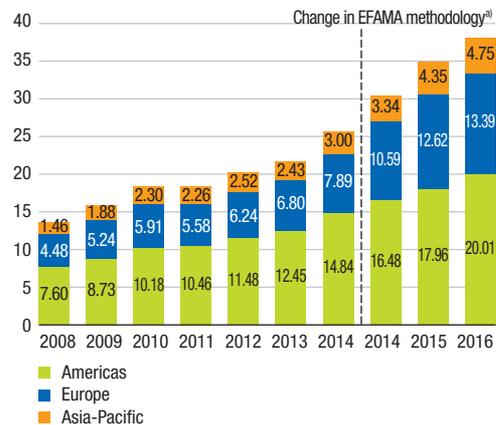
In 2016 (based on 2015 data), the global shadow banking sector was estimated to be worth USD 34 trillion, the lion’s share of which (65%) was attributable to the asset management sector,<sup>4</sup> i.e. investment funds – mainly open-ended fixed income funds, MMFs and hedge funds – that are susceptible to runs (EF1).

**112 The asset management sector is an essential component of (regulated) shadow banking**

According to the FSB, the asset management sector is the largest component of shadow banking. What is more, the sector’s total assets have increased strongly worldwide since the 2007-08 crisis, swelling by approximately

**C1 Assets in the fund industry (excluding funds of funds) by major fund domiciliation region**

(amounts in EUR trillions)



Source: European Fund and Asset Management Association (EFAMA) – *International Statistical Release*, AMF calculations.

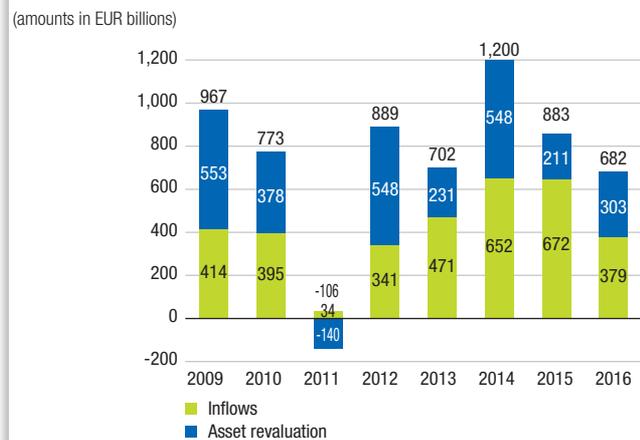
a) Note: The change in EFAMA’s methodology mainly concerns the recognition of funds of funds and also includes modifications to the fund classification rules. These changes resulted in a statistical jump of about EUR 4.7 trillion for the transition year (2014), of which EUR 1.65 trillion for the United States, EUR 1.23 trillion for Germany, EUR 450 billion for France, EUR 390 billion for Ireland, EUR 320 billion for Japan, EUR 260 billion for the United Kingdom and EUR 260 billion for Luxembourg.

12% a year from EUR 14 trillion in 2008 to EUR 38 trillion in 2016 according to the European Fund and Asset Management Association (EFAMA), in a trend seen across the globe, from the Americas to Europe and the Asia-Pacific region (see Chart 1).

The overall increase in assets under management – a full 170% between 2008 and 2016 – must be considered in light of the value growth of managed assets during a period where markets were heavily supported by expansionary monetary policies and non-standard policy measures. To illustrate this point, on equity markets, the MSCI World Index grew by 110% over the same period, while the S&P 500 gained 175% (dividends reinvested). Sovereign bond markets meanwhile were up 85% in the euro area and 90% in the United States (coupons reinvested). In the euro area, valuation effects accounted for about half of the increase in assets under management, with the remainder

4 Ibid, pp. 3-4.

### C2 Change in euro area assets (impact of net inflows and revaluation)



Source: European Central Bank (ECB) – Investment funds balance sheet; AMF calculations.

attributable to net inflows (see Chart 2). Even in 2011, at the height of the euro area crisis, when valuation effects were negative, inflows remained positive, an important point to bear in mind given the debate over the potential for asset price collapses to trigger runs and cause liquidity problems for funds.

## 2I Benefits of a common approach

International bodies have played and continue to play a central role in structuring national discussions about shadow banking. As a member of the FSB, France has contributed to the annual data gathering exercise since 2011, thereby gaining a deeper understanding of its own financial ecosystem and associated risks. Peer pressure within the FSB is another important factor, making it possible to gain a more accurate view of the global shadow banking sector, along with regional peculiarities and the main risk areas. From a regulatory policy perspective, it is worth stressing the benefits of a common and concerted approach aimed at providing an appropriate response to the specific risks connected with shadow banking.

## 2I1 Common language and peer pressure

The system set up by the FSB is valuable in several respects. From an overall perspective, it provides a shared, sophisticated and adaptable interpretive framework with which to track changes in the shadow banking sector over time. Because this is a multifaceted space that is constantly changing (reflected, for example, in certain innovative financing approaches) and that features sizeable cross-country differences, in many cases linked to the maturity of local banking sectors, the need for a common language quickly became apparent. This is the chief benefit of the FSB framework, which has proven able to transcend the difficulties linked to the existence of different national terminologies by choosing to assess the sector based on its related risks. This shared language makes it possible to conduct comparisons, notably between jurisdictions, and identify the main risk areas at the global (aggregate) level.

Over the years, the FSB framework has become more demanding in terms of data granularity and explanations about the exclusion of certain activities from the scope of shadow banking. These higher standards have prompted all FSB member jurisdictions to gain a more refined understanding of their own shadow banking sectors. This is true for France, which has given close attention to the portfolio composition of certain funds and also to finance companies (which do not necessarily have credit institution status). China is another noteworthy example. For the 2017 exercise (based on 2016 data), China agreed to undertake the full exercise and provided a “narrow” measure of its domestic shadow banking system, which was not the case in previous years. This measure will entail a restatement by the FSB of the economic function-based classification provided by the Chinese authorities as well as a clarification of the actual situations represented by such terms as “finance company” and “trust company” in China.

## 2|2 Risk assessment and proposal for regulatory harmonisation

As well as helping to understand trends and identify potential risks, the use of common data collection fields has made it possible to improve risk assessment, notably from a financial stability perspective.

Since the methodological framework was developed in 2013, the FSB and IOSCO have done joint work to identify the asset management industry’s contributions to the global financial system as well as the potential risks posed by the industry. Although they initially zeroed in on money market funds because of the weaknesses they displayed during the 2007-08 financial crisis, regulators then turned their attention to management companies and investment funds more broadly, looking beyond vehicles that strictly meet the definition of shadow banking, i.e. credit intermediation outside the banking system. After exploring the option of identifying global systemically important entities, regulators decided to steer their work in a different direction to examine the risks likely to be generated by the industry and ensure that robust systems were in place to address them. On this basis, the FSB<sup>5</sup> and IOSCO<sup>6</sup> published international standards aimed at limiting the spread, amplification and emergence of risks.

Money market funds offer a perfect illustration of shadow banking and the close links between asset management and other components of the financial system. They represent a substantial source of short-term finance for financial institutions and could disrupt them in the event of a run. On the supply side, MMFs are used as a substitute for bank deposits. Their purpose is to preserve invested capital and (or) offer a return aligned with that of the money market. While capital preservation is not the same as a guarantee (which is one thing that distinguishes a deposit from a money market fund), MMFs are invested in high-quality short-term money market instruments and thus offer credit risk diversification, daily liquidity and a low-risk

investment. Credit institutions also invest in MMFs. The linkages between MMFs and the banking sector are intrinsic to their orderly functioning. Moreover, the market is highly concentrated, with five jurisdictions accounting for 90% of assets under management.<sup>7</sup> Particularly given the size of these funds, any MMF failure could disrupt the banking sector and the wider economy, cutting off a source of short-term finance. MMFs are thus a link in the risk distribution chain and have the capacity to magnify these risks, which is what happened in 2008 when, following the Lehman Brothers failure, the Reserve Primary Fund was unable to hold its net asset value at one dollar, triggering a chain of redemptions in other MMFs.

In the wake of the crisis, IOSCO adopted a series of recommendations<sup>8</sup> designed to set international standards for MMFs to limit the risk of runs by investors in these products and make them more robust. The recommendations included requirements relating to eligible assets and the credit quality of portfolio securities, the obligation to hold a minimum amount of liquid assets and rules on valuation techniques. These recommendations, which were endorsed by the FSB, led to major reforms, especially in the United States<sup>9</sup> and Europe.<sup>10</sup> China, which is now the second-largest market after the United States, boasting total assets of over USD 1.077 trillion at end-2017 and the world’s biggest money market fund, has also bolstered its framework with new measures that came into force on 1 October 2017. Reforms by the main markets were examined against these recommendations through peer reviews conducted and published by IOSCO.<sup>11</sup>

Noting a substantial increase in assets under management and fearing a transfer of risks between the banking sector and the non-banking sector, the FSB took an interest more generally in potential “structural vulnerabilities” of asset management, with a view to maintaining global financial stability. This global “activity based” approach was designed to capture all the risks presented by a given sector without being limited to specific entities or to a strict definition, such as shadow banking for example.

5 See FSB (2017).

6 See IOSCO (2018).

7 At end-2016, the United States (EUR 2.558 trillion), China (EUR 585 billion), Ireland (EUR 478 billion), France (EUR 345 billion) and Luxembourg (EUR 334 billion) accounted for 91% of the global EUR 4.772 trillion MMF market.

8 See IOSCO (2012b).

9 The reform adopted in July 2014 by the US Securities and Exchange Commission (SEC) came into force in October 2016: <https://www.sec.gov/rules/final/2015/1c-31828.pdf>

10 See Regulation (EU) 2017/1131 of the European Parliament and of the Council of 14 June 2017 on money market funds.

11 See IOSCO (2017).

12 The three other structural vulnerabilities identified by the FSB were the risks associated with leverage within investment funds, operational risk and the risk associated with commitments made by a management company in relation to its own balance sheet when offering indemnification clauses in the framework of securities lending transactions.

13 See FSB (2017).

14 See IOSCO (2012a).

15 See IOSCO (March 2013).

16 See IOSCO (February 2018).

17 See AMF (2017b).

18 The ESRB's recommendations seek to: (i) create a reporting regime for UCITS (to be prepared by the European Commission); (ii) provide guidance on the practice of liquidity stress testing by asset managers (guidance to be prepared by ESMA); (iii) make liquidity management tools available throughout the Union (via a Commission initiative); (iv) limit fund-level liquidity transformation (through an initiative by the Commission, which will task ESMA with providing a definition for less liquid asset classes and which will impose enhanced supervision or potentially even investment limits on funds holding large shares of such assets); (v) specify the steps that national authorities should follow when they activate redemption suspensions and when there are international implications for financial stability (through an initiative by the Commission, which will assign coordination and other powers to ESMA); (vi) provide guidance on the practice of setting leverage limits pursuant to Article 25 of the AIFM Directive (guidance to be prepared by ESMA).

The FSB found that the risk of a mismatch between the liquidity offered to investors and the liquidity of underlying assets, which is intrinsic to asset management activities, constituted a significant “structural vulnerability” that deserved closer attention.<sup>12</sup> Liquidity transformation risk could be accentuated in an environment featuring low interest rates and a search for yield. According to the FSB, it could be a factor of risk contagion for other participants, such as investors and counterparties, and more generally play a part in disrupting markets, particularly in the event of large-scale investment disposals, with the risk of price decreases for affected assets. While liquidity risk management is not a new concern for participants or regulators, the FSB's work sought to ensure that systems were robust under normal market conditions as well as in situations of market stress. It also endeavoured to capture the possible impact on financial stability of the occurrence of this risk and (or) the risk of negative externalities potentially resulting from mitigation measures.

The FSB's recommendations<sup>13</sup> thus sought to (i) promote the introduction of preventive measures, with an emphasis on the requisite consistency between a fund's liability-related commitments and the liquidity of asset holdings, (ii) strengthen transparency vis-à-vis investors and authorities, (iii) encourage competent authorities to extend the liquidity risk management toolbox available to asset managers, and (iv) actively manage liquidity risk through dedicated policies, notably through the introduction of specific stress tests.

Based on the lessons learned from the crisis, IOSCO published a set of principles on suspensions of redemptions in 2012<sup>14</sup> followed by principles of liquidity risk management for investment funds in 2013.<sup>15</sup> Building on the FSB's recommendations, IOSCO undertook additional work that led to the publication of revised standards<sup>16</sup> specifying the liquidity risk management requirements that participants should meet over the entire lifecycle of a fund. In particular, these standards (i) recommended strengthening the requirements relating to knowledge

of investors, asset/liability alignment, and investor disclosures on liquidity risk exposure; (ii) provided guidelines on conducting fund-level stress tests; and (iii) introduced additional recommendations for contingency plans. The report also clarified the role of supervisory authorities in promoting and effectively implementing the recommendations, as well as their role in non-stressed situations (drafting policy, assessing the appropriateness of redemption conditions during authorisation and within the framework of supervision) and stressed situations (while emphasising that primary responsibility lies with asset managers, which are required to warn the authorities).

The discussions arising out of this work have already had significant effects on participants and authorities alike. Since liquidity risk management is at the heart of the asset management business, a number of major firms have already revised and supplemented their procedures. Market authorities have also taken on the issue, with some of them amending their regulations to comply with the recommendations. The United States, to give an example, adopted a large-scale reform to this effect in October 2016. France also conducted in-depth work to overhaul its framework, introducing new liquidity management tools such as gates, investment and/or redemption notice periods, in-kind redemptions, and partial or total closure of subscriptions for certain investment vehicles. France additionally published policy documents, including a stress testing guide,<sup>17</sup> to help firms implement the new requirements. Another ongoing initiative is aimed at assessing the extent to which leverage at investment funds represents a risk for financial stability. The goal is to identify techniques to measure leverage, monitor trends over time and spot excessively leveraged funds so that national authorities can take appropriate steps. This work area is a priority for 2018. The European Systemic Risk Board (ESRB) published recommendations on this front in 2018.<sup>18</sup>

In this sense, the work being done on asset management illustrates a determination to regulate

potential systemic risks by means of a holistic approach and emphasises the role that authorities can play in recognising the risks to financial stability.

### 3I Promote a “risk-based approach”

The close attention paid to the shadow banking sector by macroprudential authorities stems from a determination to control systemic risk, and this macroprudential risk-based approach must therefore naturally guide regulation. The very nature of this sector, which has close ties to market participants and activities that have traditionally been subject to prudential regulation (banks, insurers) and which can perform activities that substitute for those of the conventional sector (such as granting credit) offers an even more compelling argument for a holistic approach. Take the example of the French asset management industry, which comprised 10,263 funds and EUR 1.408 trillion in assets in 2016: a full 60% of fund liabilities were attributable to financial counterparties, notably insurers, while assets were essentially composed of bank securities. Accordingly, any discussion about asset management’s contribution in the event of a violent market shock (i.e. does it cushion or amplify the effect?) cannot disregard insurers’ redemption behaviour or the bank financing provided by funds. It is similarly important to consider the appropriate counterfactual scenario: if there were no asset management sector, investors would hold the assets contained in funds directly, and their response in the event of a market shock should also be examined.

This makes it crucial to have a description of the interconnections between all the participants present in fund assets and liabilities. This description needs to be not only qualitative, but also quantitative, in order to measure the attenuation or exacerbation effects following an initial shock. The risks inherent in creating any model and in defining assumptions that are by definition arbitrary (investor behaviour in the event of a fall in prices, impact on redemptions, shift in flows to other vehicles, countercyclical

action by participants, triggering of redemption restrictions, etc.) mean that caution is required. Some of the work being done in this area is academically focused, and considerable effort is still needed before operational recommendations can be issued for the macroprudential field.

On this point, while national, regional and international authorities are stepping up their cooperation on these issues, the capacity to strengthen these systems (particularly in terms of data) among market and prudential regulators as well as across jurisdictions remains a major challenge.

#### 3I1 Analysing interconnections

The non-bank financial sector thus forms a part of the complex financial intermediation and interrelational chains that link banks, insurers and potentially pension funds and investment funds (Pozsar et al. 2013; Cetorelli 2014). A sound assessment and understanding of the nature and scale of these interconnections is a key challenge for macroprudential regulators, particularly since they were not properly understood during the 2007-08 financial crisis.

In France, the *Haut Conseil de stabilité financière* (HCSF – High Council for Financial Stability) has begun a project to describe the network of French participants. Based on pooling the *Autorité des marchés financiers* (AMF) and Banque de France databases, this work has revealed the French network to be enormous, at some 10,000 entities, but not particularly dense in relative terms, as it comprises only 60,000 links. France’s network is distinctive in exhibiting a “small world” structure, where members are separated from each other by a small average distance (calculated by the number of steps). This is partly due to the existence of highly connected “pillar” entities integrated within the main financial groups. Specifically, asset managers are often closely tied to the insurers with which they have most of their dealings. This work must be continued and could eventually generate models for how shocks spread

through exposure to investment funds, within the framework of macro stress tests.

Without waiting for the outcome of such initiatives, which could take several years, smaller-scale projects are already providing potentially useful results. The HCSE, for example, carried out a stress test in 2016 that looked at the resilience of the French financial sector in the event of a negative shock on the commercial real estate market. Assuming a major but plausible market decline, with prices assumed to plummet by as much as 60% in the Paris area, the participating French authorities (the AMF, the Banque de France and the *Autorité de contrôle prudentiel et de résolution* or ACPR) applied the scenario to their respective areas of jurisdiction, i.e. insurance, banking and fund management. Although interconnections were not explicitly taken into account, the assumptions used made it possible to include their effects implicitly. For example, the assumption for redemptions of real estate funds was highly conservative (up to 50% in two months, i.e. implied elasticity relative to performance double the empirically observed value).

Another example is the AMF's 2017 study on the impact on market liquidity and stability of exchange-traded funds (ETFs),<sup>19</sup> an area that has seen major growth. By integrating the links between these asset management products and underlying markets, the study revealed that the circuit-breaker mechanisms in place on Euronext Paris help limit the risk of large gaps between the traded price of an ETF and the indicative net asset value of the underlying baskets. The study also found that take-up rates for Paris market ETFs are not themselves sufficient to have a significant impact on their underlying markets in the event of a massive withdrawal. Lastly, primary flows appear to be countercyclical, serving to dampen rather than magnify major price moves.

### 3|2 The data challenge

Notwithstanding these instructive examples, the data issue needs to be resolved if we are to move

towards global modelling of the financial sector in order to develop an integrated vision of risk. The issue of data availability has naturally been the topic of much discussion since the crisis. It is central to the shadow banking recommendations made by the FSB, which has called for steps to close data gaps. IOSCO has taken on the subject as well and recommended gathering data on all open-ended funds and individual mandates. Data access is also drawing growing interest from European bodies with the introduction of new disclosure requirements for MMFs and future requirements for securitisation transactions. As part of this, Europe has already begun the push to extend management-related reporting by introducing more reports and requiring more in-depth information (securities financing transactions, MMF reporting including line-by-line portfolio disclosures, ESRB support for extending alternative investment fund (AIF) reporting to UCITS).

This work requires regulators to think about collection methods, given the planned data use and the necessary resources, as significant costs may be generated for reporting entities and authorities alike. For the industry, reporting requirements represent a cost that may seem significant given firms' various disclosure obligations, possible redundancies in the data required, and limited visibility on the use made of the data by the regulator. For regulators, gathering data, ensuring their reliability and comparing data from different reporting sources can play a decisive role in using data effectively for microeconomic and macroeconomic purposes. However, this requires substantial resources at a time when they are limited.

Within Europe, efforts could be pooled through the European Securities and Markets Authority (ESMA), whose role needs to be re-examined as part of the review of the European supervisory authorities. Rendering data more reliable, improving their quality and sharing them at an appropriate level between authorities would be more effective within a European framework.

<sup>19</sup> See AMF (2017a).

### 4| Conclusion

Five years since a methodological framework was adopted to measure shadow banking and its associated risks, headway has unquestionably been made in understanding the different situations encompassed by the concept and in the quality of data gathered. The framework has proven itself and should be maintained to enable global comparability and permit analyses to be performed over time. But it needs to be rounded out with a post-mitigant assessment to steer the attention of regulators towards

persistent risks and also with a mechanism to spot emerging risks quickly. Technological disruptions and the fast pace of innovation mean that authorities need an active monitoring system. Moreover, recent research has exposed the limits of the inherently restrictive notion of shadow banking and highlighted the need to get beyond the concept to adopt a risk-based approach that can supplement the FSB's annual monitoring. The adoption of a less pejorative and broader term such as "non-bank finance" or "market-based finance", which some have suggested, would be a welcome step.

# References

### Autorité des marchés financiers – AMF (2017a)

*Les ETF: caractéristiques, état des lieux et analyse des risques – Le cas du marché français*, 14 February: <http://www.amf-france.org/Publications/Lettres-et-cahiers/Risques-et-tendances/Archives?docId=workspace%3A%2F%2FSpacesStore%2F2F2d61ede7-b0be-40fa-8654-fe438a33ad00>

### AMF (2017b)

*Utilisation des stress tests dans le cadre de la gestion des risques : guide pédagogique pour les sociétés de gestion de portefeuille*, 23 February: <http://www.amf-france.org/Publications/Guides/Professionnels?docId=workspace%3A%2F%2FSpacesStore%2F8e10f441-056c-4809-9881-36c23a292200>

### Basel Committee on Banking Supervision – BCBS (2017)

*Guidelines – Identification and management of step-in risk*, October: <https://www.bis.org/bcbs/publ/d423.pdf>

### Cetorelli (N.) (2014)

“Hybrid intermediaries”, *Staff Report*, Federal Reserve Bank of New York, No. 705, December.

### Financial Stability Board (2013)

*Strengthening oversight and regulation of shadow banking – Policy framework for strengthening oversight and regulation of shadow banking entities*, August: [http://www.fsb.org/wp-content/uploads/r\\_130829c.pdf](http://www.fsb.org/wp-content/uploads/r_130829c.pdf)

### FSB (2017)

*Policy recommendations to address structural vulnerabilities from asset management activities*, January: <http://www.fsb.org/wp-content/uploads/FSB-Policy-Recommendations-on-Asset-Management-Structural-Vulnerabilities.pdf>

### G20 (2011)

G20 Final Declaration, Cannes Summit, November: <https://lin.ambafrance.org/Sommet-de-Cannes-Communique-final>

### International Organization of Securities Commissions (IOSCO) (2012a)

*Principles on suspensions of redemptions in collective investment schemes*, January: <https://www.iosco.org/library/pubdocs/pdf/IOSCOPD367.pdf>

### IOSCO (2012b)

*Policy recommendations for money market funds – Final report*, FR07/12, October: <http://www.iosco.org/library/pubdocs/pdf/IOSCOPD392.pdf>

### IOSCO (2012c)

*Global developments in securitisation regulation – Final report*, FR08/12, November: <http://www.iosco.org/library/pubdocs/pdf/IOSCOPD394.pdf>

### IOSCO (2013)

*Principles of liquidity risk management for collective investment schemes*, FR03/13, March: <https://www.iosco.org/library/pubdocs/pdf/IOSCOPD405.pdf>

### IOSCO (2017)

*Update to the IOSCO peer review of regulation of money market funds*, FR19/2017, November: <https://www.iosco.org/library/pubdocs/pdf/IOSCOPD583.pdf>

### IOSCO (2018)

*Recommendations for liquidity risk management for collective investment schemes – Final report*, FR01/2018, February: <http://www.iosco.org/library/pubdocs/pdf/IOSCOPD590.pdf>

### Pozsar (Z.), Adrian (T.), Ashcraft (A.) and Boesky (H.) (2013)

“Shadow banking”, *Economic Policy Review*, Federal Reserve Bank of New York, Vol. 19, No. 2, December, pp. 1-16.

# Achieving the G20 goal of resilient market-based finance

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

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

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

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

## 11 The rise and fall of toxic shadow banking

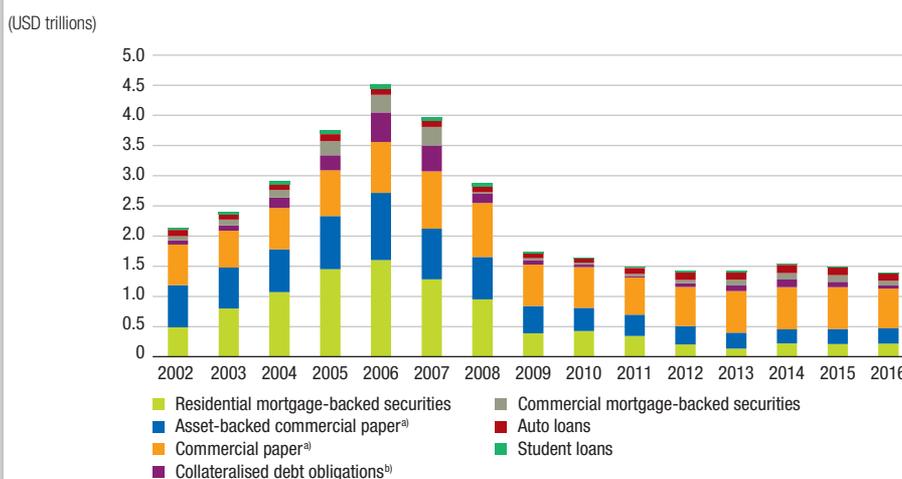
In the years leading up to the crisis, structural vulnerabilities had built up in global financial system. Complex financial products with long intermediation chains and misaligned incentive structures led to an accumulation of exposures that were poorly understood and managed across the system. Securitisation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

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

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

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

C1 US and European structured finance



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

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

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

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

## 21 The financial system is now safer

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

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

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

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

### 212 Policy measures to address shadow banking risks

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

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

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

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

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

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

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

## 2/3 Toxic shadow banking risks have declined significantly

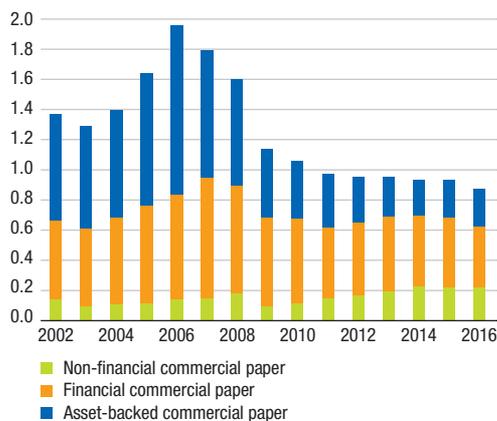
In July 2017, the FSB reported to G20 Leaders on the measures its members had taken to address shadow banking risks.<sup>4</sup> The FSB's assessment highlighted that the most vulnerable or toxic parts of shadow banking activities which contributed to the crisis have declined significantly. These include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

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

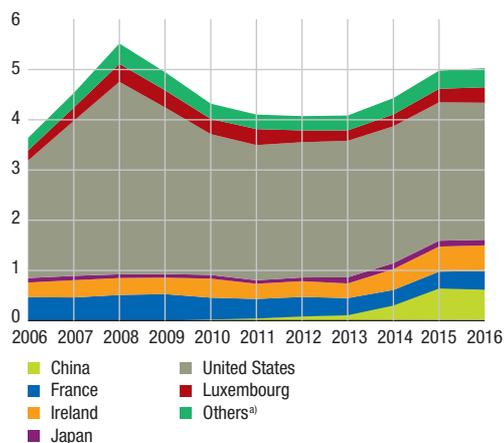
## C2 Commercial paper and money market funds

(USD trillions)

a) US Commercial paper outstanding



b) Assets of money market funds



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

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

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

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

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

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

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

### 31 Evolving risks

#### 311 Liquidity risks from asset management activities

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

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

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

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

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

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

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

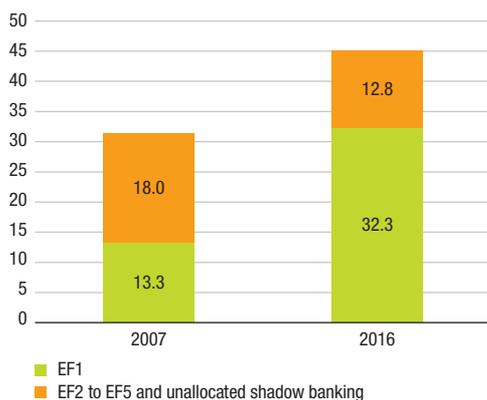
areas in which large-scale outflows from funds could affect other parts of the financial system.

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

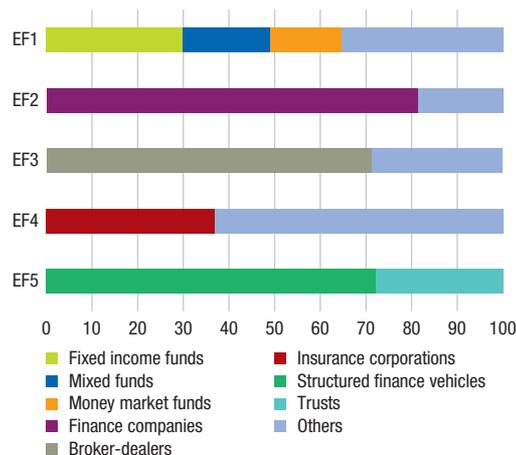
### C3 The evolution of shadow banking activities by economic function

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

#### a) Evolution of shadow banking by economic function



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



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

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

Narrow measure for 29 jurisdictions, including China.

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

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

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

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

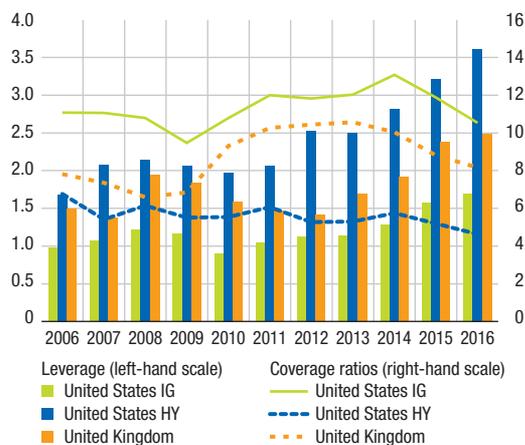
The financial stability implications of such a deterioration of credit risk would depend on a number of factors. The first line of defence is sufficient buffers to absorb losses, which prevent them from spreading through the financial system. Another is prudent assessment and management of risks, which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

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

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

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

a) US and UK corporate leverage and coverage ratios



b) EME corporate leverage and coverage ratios



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

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

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

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

### 4I Addressing evolving risks

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

#### 4I1 Enhanced monitoring

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

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

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

#### 4I2 Macroprudential toolkit

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

##### Measures to address growing liquidity transformation

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

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

<sup>8</sup> See Moody's Investors Service (2017).

<sup>9</sup> See FSB (2017a) and IOSCO (2018).

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

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

#### Macro stress simulations to assess system-wide liquidity risks

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

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

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

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

## 51 Conclusion

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

<sup>10</sup> See Baranova, Coen, Lowe, Noss and Silvestri (2017).

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

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

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

## References

Baranova (Y.), Coen (J.), Lowe (P.), Noss (J.) and Silvestri (L.) (2017)

“Simulating stress across the financial system: the resilience of corporate bond markets and the role of investment funds”, *Bank of England Financial Stability Papers*, No. 42, July: <https://www.bankofengland.co.uk/-/media/boefiles/financial-stability-paper/2017/simulating-stress-across-the-financial-system-resilience-of-corporate-bond-markets.pdf?la=en&hash=C28EF509958C424DE474CADE1BBC137A7D4C0523>

Basel Committee on Banking Supervision – BCBS (2017) *Guidelines – Identification and management of step-in risk*, Bank for International Settlements, October: <https://www.bis.org/bcbs/publ/d423.pdf>

Basel Committee on Banking Supervision (BCBS) – International Organization of Securities Commissions (IOSCO) (2015)

*Criteria for identifying simple, transparent and comparable securitisations*, Bank for International Settlements, July: <https://www.bis.org/bcbs/publ/d332.pdf>

Financial Stability Board (2011)

*Shadow banking: strengthening oversight and regulation* – Recommendations of the Financial Stability Board, October: [http://www.fsb.org/wp-content/uploads/r\\_111027a.pdf](http://www.fsb.org/wp-content/uploads/r_111027a.pdf)

Financial Stability Board (2017a)

*Policy recommendations to address structural vulnerabilities from asset management activities*, 12 January: <http://www.fsb.org/wp-content/uploads/FSB-Policy-Recommendations-on-Asset-Management-Structural-Vulnerabilities.pdf>

Financial Stability Board (2017b)

*Assessment of shadow banking activities: risks and the adequacy of post-crisis policy tools to address financial stability concerns*, 3 July: <http://www.fsb.org/wp-content/uploads/P300617-1.pdf>

Financial Stability Board (2017c)

*Implementation and effects of the G20 financial regulatory reforms – 3<sup>rd</sup> Annual Report*, 3 July: <http://www.fsb.org/wp-content/uploads/P030717-2.pdf>

Financial Stability Board (2018)

*Global Shadow Banking Monitoring Report 2017*, 5 March: <http://www.fsb.org/wp-content/uploads/P050318-1.pdf>

IOSCO (2018)

*Recommendations for liquidity risk management for collective investment schemes – Final Report*, No. FR01/2018, February: <https://www.iosco.org/library/pubdocs/pdf/IOSCOPD590.pdf>

Moody's Investors Service (2017)

*Protection nears worst level ever, even as spreads narrow to record lows*, North American covenant quality index, 8 August.



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The challenge of high capital inflows to financial stability: an emerging market perspective  
Global imbalances: the international monetary system and financial stability  
Global imbalances: the perspective of the Banco de México  
Complementarity and coordination of macroeconomic and financial policies to tackle internal and external imbalances  
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Global balance and financial stability: twin objectives toward a resilient global economic system  
Global imbalances: the perspective of the Bank of England  
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A South African perspective on global imbalances  
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- When Western sovereign risk is in play
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International cooperation: a sine qua non for the success of OTC derivatives markets reform

Containing extraterritoriality to promote financial stability

International swaps market reform – Promoting transparency and lowering risk

CPSS-IOSCO Principles for financial market infrastructures: vectors of international convergence

A transparency standard for derivatives

New infrastructures for a sounder financial system

The importance of data quality for effective financial stability policies

Legal entity identifier: a first step towards necessary financial data reforms

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