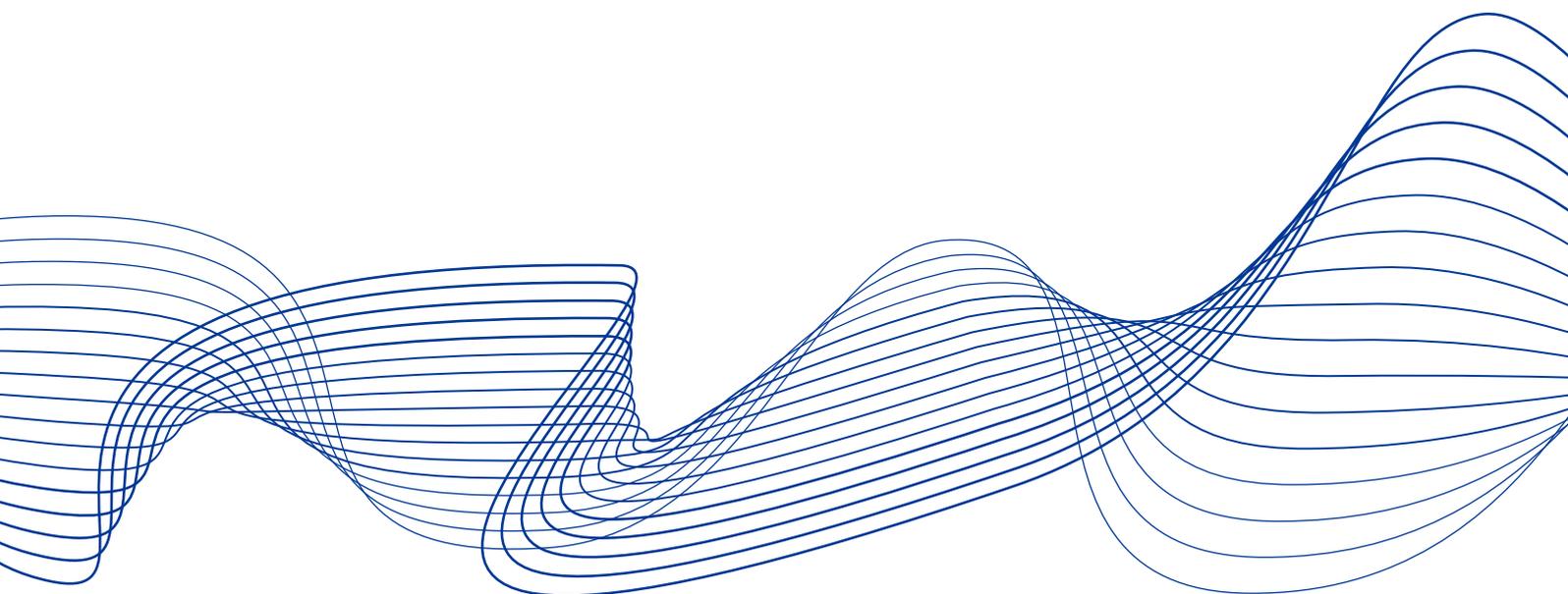


**Macroprudential policy
beyond banking:
an ESRB strategy paper**

July 2016



ESRB
European Systemic Risk Board
European System of Financial Supervision

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¹ This is a strategy paper prepared by the ESRB Instruments Working Group (IWG) chaired by Aerd Houben (De Nederlandsche Bank, DNB). It builds on contributions by the ESRB Secretariat and members of the IWG, the Advisory Technical Committee and other ESRB working groups. It was written by Jon Frost (DNB), Julia Giese (Bank of England), Michael Grill (ECB), Elisabeth Tietz (ESRB Secretariat), Michael Wedow (ECB), Olaf Weeken (ESRB Secretariat) and Peter Wierts (DNB), who coordinated the project.



Preface

In recent years, financial sector growth has primarily occurred outside the banking system. This development is expected to continue, supported by the move to a European Capital Markets Union. The growth of finance beyond banking reflects new opportunities, but may also bring financial stability risks.

Against this background, this strategy paper analyses the current legal and institutional framework governing macroprudential policies beyond banking and proposes a holistic policy strategy to address financial stability risks. The paper presents short-term policy options and a long-term policy agenda, including the development of a resilience standard based on the contribution of financial entities and activities to systemic risk.

This strategy paper is a complement to the Flagship Report and Handbook on the application of macroprudential policy in the banking sector, published in 2014. It reflects the ESRB's ongoing contribution to the development of macroprudential policy for banking and beyond and the concerted efforts of all its members to promote a stable and diverse financial system in Europe that is conducive to sustainable economic development.

Frankfurt am Main, July 2016



Mario Draghi
Chair of the European Systemic Risk Board



Executive summary

- **This paper sets out a policy strategy to address risks to financial stability wherever they arise in the financial system.** While macroprudential policy for the banking sector is already operational, the policy strategy, data and instruments to address risks beyond the banking sector are underdeveloped. This leaves a gap in financial stability policy. Filling this gap will require a broad range of stakeholders in Europe to work together, including legislators, the European Systemic Risk Board (ESRB), macroprudential authorities and microprudential and market conduct regulators. It also requires being mindful of, without being limited by, broader international efforts to make the financial system safer, such as those of the Financial Stability Board (FSB).
- **Risks to financial stability can originate in the banking sector and in other parts of the financial system.** Risks can originate from different sources including: (i) excessive credit growth and leverage, leading to credit booms and busts; (ii) excessive maturity and liquidity mismatch and market illiquidity, leading to fire sales of assets; (iii) direct and indirect exposure concentrations, leading to contagion amongst interconnected financial institutions; and (iv) misaligned incentives, reflecting perceptions that some institutions are “too big to fail”. These sources of risk transcend sectoral boundaries. For example, while excessive leverage has been associated with banks, it can also be created outside the banking sector through collateralised lending, such as securities financing transactions (SFTs), or through collateralised mortgage financing. Banks and non-banks can also create excessive leverage synthetically through the use of derivatives.
- **Addressing risks beyond banking requires macroprudential instruments that apply to both lenders and borrowers, targeting entities and activities.** Current macroprudential requirements mainly apply to bank credit, which is only one component of total credit. But all forms of credit can contribute to credit booms and busts. Hence, all forms of credit need to be within scope, i.e. bank loans, non-bank loans and debt securities, whether domestic or cross-border. In addition to non-bank lenders, macroprudential policy can directly target total credit of borrowers. In this context, while mortgage lending can come from non-bank sources, such as pension funds, insurers and investment funds, loan-to-value (LTV) limits in several EU countries currently only apply to lending by domestic banks.
- **The move to a more market-based financial system underscores the need for a broader set of macroprudential instruments.** A diversification of the sources of financing fosters the resilience of financing and contributes to economic growth. In this light, the European Capital Markets Union seeks to increase the share of financing provided to the real economy through market-based channels. By the same token, policymakers need to be provided with the policy instruments to prevent or mitigate new systemic risks arising from this shift in financing structure.
- **Macroprudential instruments to address financial stability risks beyond the banking sector should be part of a wider macroprudential policy strategy.** The macroprudential policy strategy comprises the links between indicators of systemic risks, intermediate policy objectives, macroprudential instruments and the ultimate financial stability objective. The development of this strategy needs to take account of different degrees of systemic risk in different parts of the financial sector. It also needs to weigh the long-term benefits of financial stability against possible short-term costs in terms of constraints on credit provision. The design and calibration of such instruments may differ across sectors and financial infrastructures, reflecting different contributions of entities and activities to leverage, maturity



and liquidity transformation, exposure concentrations and interconnectedness, and misaligned incentives.

- **The ESRB has a leading role in the development of the macroprudential policy strategy and instruments to address risks beyond the banking sector.** The ESRB has been given responsibility for the macroprudential oversight of the EU financial system as a whole, thereby complementing the sectoral perspectives of microprudential and market conduct regulation under the responsibility of other bodies. The ESRB's broad membership, which includes legislators, macroprudential authorities and microprudential and market conduct regulators, enables the ESRB to draw on a broad range of expertise.

Key tasks for the ESRB and its members

A. In the medium to long term:

- To develop a strategy for macroprudential policy beyond banking that targets risks across the whole financial system with a consistent, albeit not necessarily uniform, set of instruments.
- To develop a framework that links the required level of resilience of specific parts of the financial system, such as market-based finance, to their contribution to the systemic risk facing the financial system as a whole.
- To regulate financial entities and activities in line with the intensity of systemic risk arising from externalities and market failures. As a rule of thumb, macroprudential policy should be more intensive in those areas where systemic risk is higher.
- To address risks of excessive credit growth at the level of end-borrowers, independently of the type of credit (i.e. bank loans, non-bank loans or marketable debt securities; domestic or cross-border).

B. In the short to medium term:

- To use new data that will become available under existing legislation beyond banking, such as those for alternative investment funds (from the Alternative Investment Fund Managers Directive or AIFMD), insurers (from Solvency II), derivatives markets (from the European Market Infrastructure Regulation or EMIR) and for securities financing (from the Securities Financing Transactions Regulation, or SFTR, in the course of 2018), to monitor market trends and risks to financial stability.
- To operationalise macroprudential instruments for which a legal basis has already been created, in particular by providing advice to the European Securities and Markets Authority (ESMA) on the AIFMD framework for leverage requirements.
- To contribute to the development of new macroprudential instruments, such as instruments that address liquidity mismatches at investment funds and the procyclicality of initial margins or haircuts, especially in securities financing transactions and derivatives.
- To contribute to the development of the wider financial stability toolkit, such as top-down stress tests for asset managers and funds, financial market infrastructures including central counterparties (CCPs), insurers and pension funds, and recovery and resolution frameworks for CCPs and insurers.
- To investigate the potential for increasing the consistency of available macroprudential instruments across sectors, e.g. definitions of leverage, taking into account differences and interdependencies between sectors.
- To monitor the impact of ongoing legislative reforms, e.g. new regulations and directives on markets for financial instruments, on the financial system.
- To provide ESRB input to ongoing legislative reviews so as to ensure the macroprudential perspective is included in all relevant regulation in the EU.



Section 1

Introduction

1. **The evolution towards a more market-based financial system, where more financial intermediation occurs outside the banking sector, is welcome.** Market-based finance can provide a “spare tire” when banks are under pressure (IMF, 2015a). A more diversified financial system can improve the availability of credit for firms and contribute to growth in the real economy (European Commission (EC), 2015). Non-bank financial institutions are generally less leveraged and less subject to maturity mismatch than banks.² Complementing credit intermediation through banks with market-based finance can therefore be beneficial from the perspective of financial stability. Such dynamics are in line with the strategic objective of developing a more market-based EU financial system, i.e. a European Capital Markets Union (EC, 2015).
2. **Experience shows that non-bank financial intermediation can, however, also pose risks to financial stability.** While many systemic crises are characterised by bank failures or bail-outs, and banks often played an amplifying role in financial stress, crises have not always been caused or triggered by banks. One example is the near-failure of the hedge fund Long-Term Capital Management (LTCM) in 1998. It led to a debate on the systemic importance of highly leveraged and interconnected institutions and to several proposals to address those risks (Financial Stability Forum (FSF), 2000). Another example in the early 1970s in the United Kingdom was the crisis that resulted from so-called unregulated “fringe” institutions funding themselves in money markets and investing these funds largely in commercial property developments. This crisis, which is known as the secondary banking crisis, also led to legal reforms, including the definition of banking services in the UK’s Banking Act of 1979.
3. **More recently, non-banks and failures in market functioning that transmitted shocks across the financial system contributed to the global financial crisis.** Prior to the crisis, the securitisation of mortgages and the sale of these mortgage-backed securities to investors reduced banks’ incentives to screen and monitor their mortgage lending. This contributed to overborrowing and subsequent problems in the funding markets for banks and other financial institutions heavily exposed to real estate as securities markets and money markets became dysfunctional.³ The “breaking of the buck” of a money market fund (MMF) following the failure of Lehman Brothers (an investment bank) played an amplifying role in the global financial crisis. So too did the near-failure of AIG, an insurance group which had a large volume of the so-called “non-traditional non-insurance” (NTNI) activity and had become “too big to fail”.⁴
4. **Loans made by non-banks and debt securities issued by corporates can also contribute to credit booms and busts.** For example, the strong increase in corporate indebtedness in emerging markets is seen as a source of concern by the International Monetary Fund (IMF, 2015b). It coincides with a shift in composition away from loans towards

² As will be described below, non-bank financial institutions may nonetheless contribute to *economy-wide* leverage and liquidity mismatches, often through a chain of transactions between separate intermediaries.

³ As a result, regulation has been changed (e.g. minimum retention requirements for originating banks, proposal for simple, transparent and standardised (STS) securitisations, rules on rating agencies, etc.).

⁴ As explained by the International Association of Insurance Supervisors (IAIS, 2011), the non-insurance subsidiary of AIG had underwritten a large volume of credit default swaps (CDSs), which – in combination with the significant leverage of the group and its large investments in illiquid securities – led to the financial problems of the company.



debt securities, and the use of both micro- and macroprudential instruments has been suggested to contain excessive increases in corporate leverage.

5. **A broad view of financial stability that takes account of risks to the real economy therefore has to go beyond banking.** Macroprudential policies should apply to the financial system as a whole. One of the recommendations of the de Larosière report (2009, p. 46) was to “*pool and analyse all information, relevant for financial stability, pertaining to macro-economic conditions and to macro-prudential developments in all the financial sectors*”. As a result, the Regulation that establishes the ESRB provides it with a mandate to oversee systemic risk in the financial system as a whole.⁵
6. **The macroprudential policy framework in the EU is under construction and lacks instruments to address risk beyond the banking sector.** Macroprudential policy instruments for banks, as enshrined in the European Capital Requirements Regulation and Directive (CRR/CRD IV), are being implemented since 2014 (ESRB, 2014). Discussions are ongoing within the FSB and ESRB with respect to developing instruments that policymakers can deploy at their discretion to address risks beyond the banking sector. Examples include the use of margins and haircuts for securities financing transactions (SFTs), leverage restrictions and liquidity regulation for investment funds, and activity-based measures for commercial real estate.
7. **The lack of a comprehensive macroprudential policy framework can cause activities and risks to migrate across sectors and borders.** Regulatory requirements often apply to entities within a certain jurisdiction. This causes activities to migrate across borders and sectors, as confirmed by recent research.⁶ Cross-border migration is being addressed through reciprocity in the banking sector, in part through a voluntary ESRB framework (ESRB, 2015c) and reciprocity arrangements governing the countercyclical capital buffer. The impact of migration across sectors is more nuanced, as a shift to more non-bank finance – although intended – may also reflect a rise in new systemic risks. The contribution of securitisation and off-balance-sheet vehicles to the upturn of the financial cycle in the run-up to the global financial crisis illustrates how the migration of activities may lead to new forms of systemic risk outside the traditional regulatory perimeter. A lack of supervisory data and differences in the regulatory framework imply that such cross-sector migration is difficult to capture. This increases the relevance of broad-based limits to debt financing at the level of the end-borrower.
8. **The greater role for non-banks in financing the real economy underscores the need to broaden the macroprudential framework.** The EU financial system remains primarily bank-based, but the non-bank component of the financial system has grown much faster since the crisis. While the aggregate growth of bank balance sheets is flat (Figure 1), a measure of EU market-based financing (other financial institutions, or OFIs, and investment funds) has almost doubled since 2008, and insurance companies and pension funds (ICPFs) have grown by 65%. The EU’s Action Plan towards a Capital Markets Union (EC, 2015) is expected to foster this development. The European Commission has announced that it will work with the FSB and the European Supervisory Authorities (ESAs) alongside the ESRB to assess possible

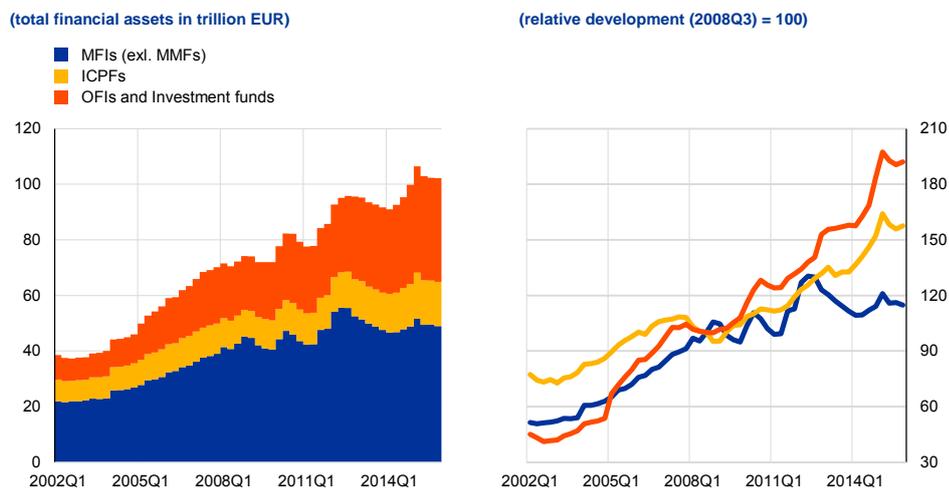
⁵ Regulation (EU) No 1092/2010 of the European Parliament and of the Council of 24 November 2010 on European Union macro-prudential oversight of the financial system and establishing a European Systemic Risk Board.

⁶ See Aiyar et al. (2014) and Reinhart and Sowerbutts (2015) for cross-border substitution. Cizel et al. (2016) examine cross-sector substitution effects of macroprudential policy in a cross-country panel over the period 2000-13 and find evidence of an increase in non-bank credit following macroprudential policy measures.



risks to financial stability arising from market-based finance. Moreover, the Commission will make any necessary changes to the macroprudential framework in the context of the forthcoming ESRB review (EC, 2015).⁷

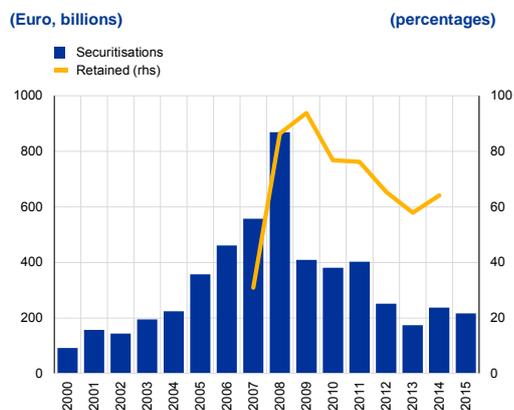
Figure 1
Components of the EU financial system



Sources: ECB and ESRB calculations.

Notes: MFIs stands for monetary financial institutions. The measure of market-based finance comprises MMFs, non-MMF investment funds and OFIs.

Figure 2
Securitisation⁸ in the EU – new issues



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

9. **Financial stability is a precondition for market development.** When markets become dysfunctional during a crisis, this may lead to a structural setback to the depth and liquidity of those markets. Figure 2 provides an example based on recent experience with the EU securitisation market. In particular, the fact that new issues remain low relative to pre-crisis levels, while the share of securitisations retained on banks' balance sheets remains high, shows that securitisation markets are still impaired following the effective closure of primary and secondary markets during the global financial crisis. Reviving these markets such that robust securitisations can fulfil their useful economic function is taking considerable efforts (Bank of England/European Central Bank, 2014; EC, 2015).

⁷ In this respect, EC (2015, p. 26) notes: "The Commission will work with the FSB and ESAs alongside the ESRB to assess possible risks to financial stability arising from market-based finance. Further analytical work will be conducted, for example to better understand the issues of market liquidity and interconnectedness in the financial system, and to assess if additional macro-prudential instruments should be developed. The Commission will make any changes necessary to the macro-prudential framework in the context of the forthcoming ESRB review."

⁸ Securitisation includes mortgage-backed securities, asset-backed securities (ABSs), collateralised debt obligations, whole business securitisations and ABSs backed by small and medium-sized enterprise loans.



10. **This paper takes a holistic view of systemic risks and macroprudential instruments in the non-bank financial sector.** Section 2 discusses systemic risks from non-bank intermediation. Section 3 discusses policies to mitigate these risks. Section 4 discusses macroprudential elements in existing or forthcoming EU legislation. Section 5 is about the institutional setting, and Section 6 sets out the way forward. The executive summary sets out key tasks for the ESRB and its members, while the annex provides an overview of macroprudential elements in EU legislation for the non-bank financial sector.



Section 2

Sources of systemic risk from the non-bank financial system

11. **The financial system provides a range of critical services for the economy.** These include payments, securities settlement, clearing, intermediating between savers and borrowers as well as between investors and entrepreneurs, risk-sharing and insurance. While banks play an important role in intermediation, entities and activities beyond the banking sector provide related services for the financial system and the real economy, and are interconnected with systemically important institutions and important markets.
12. **The financial system is subject to systemic vulnerabilities that can, if they materialise, jeopardise the provision of services to the real economy.** The ESRB Regulation (2010) defines systemic risk as “a risk of disruption in the financial system with the potential to have serious negative consequences for the internal market and the real economy.”⁹ It is the task of macroprudential policy to address these risks, which arise through market failures such as externalities. In particular, individual agents may not take into account the effect of their own actions on the system as a whole, for example in transacting in an asset and in the pricing of risk.
13. **Systemic risk has a time dimension and a cross-sectional dimension.**¹⁰ The former captures the endogenous build-up of aggregate risk over the financial cycle. The latter captures interconnections between financial networks that may transmit instability through the system and to the real economy. This section discusses the two in turn, giving examples that go beyond banking.
14. **In relation to market-based finance, the combination of incentive problems, herding behaviour and run risks can have macroeconomic consequences.** These include price externalities, fire sales, contagion and volatility (IMF, 2015a). Collective procyclical behaviour of market players contributes to fluctuations in the financial cycle (i.e. the time dimension of systemic risk):
 - excessive growth of credit to the real economy has been identified as a key driver of asset price bubbles and subsequent financial crises;¹¹
 - leverage amplifies the financial cycle and reduces the resilience of market participants;
 - reliance on short-term and unstable funding may lead to fire sales, market illiquidity and contagion as firms seek to meet withdrawals and hoard liquidity.
15. **Research finds that market-based finance has generally been less procyclical than bank credit.**¹² Within banks, procyclicality is driven by the leverage and maturity mismatch on

⁹ The ESRB Regulation (2010) defines the financial system as “all financial institutions, markets, products and market infrastructures”. Danielsson and Zigran (2015) emphasise that systemic risk is an endogenous concept, as it arises from disturbances in the functioning of financial intermediaries in a system. While the trigger may be an exogenous shock, systemic crises involve endogenous amplification mechanisms in the interaction between different players in the system.

¹⁰ See Borio (2009).

¹¹ See, among others, Jordà, Schularick and Taylor (2013). Similarly, Schularick and Taylor (2012) document more than a century of credit booms gone bust, where leverage cycles are at the core of financial crises.

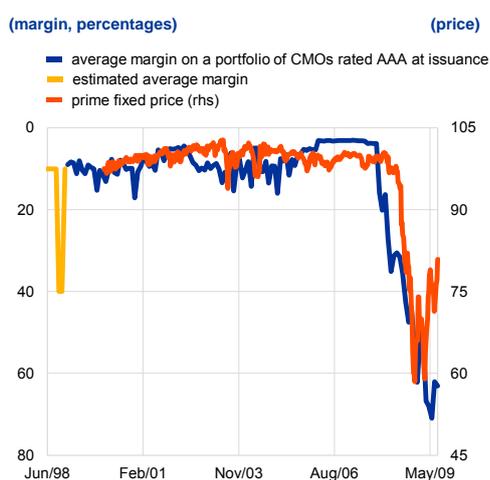
¹² See Becker and Ivashina (2014); Langfield and Pagano (2016).



their balance sheets. Market-based credit supply generally involves less leverage and maturity transformation, and is generally found to be less procyclical. Non-bank institutions can, however, still contribute to overall leverage and maturity mismatches in the financial system, including through chains of transactions.¹³ The effects on end-borrowers, investors and markets may thus feed the financial cycle.

16. **For example, strong demand for market-based corporate debt by non-banks could lead to excessive credit growth in the sector.**¹⁴ This raises the risk that corporates may at some point no longer be able to service their debt, for example if interest rates rise sharply, if their profitability is hit or if the exchange rate moves in an adverse way (in the case of foreign currency borrowing). Concerns about a few companies may easily spread to the majority of highly leveraged corporates and result in a sudden stop in funding. This may lead to deleveraging of corporates with severe consequences for the real economy. A re-evaluation of risk could also lead to asset fire sales that spill over to other asset classes, with large price moves in secondary markets where market liquidity has declined.

Figure 3
Secured lending haircuts on AAA-rated mortgage-backed securities



Sources: Ellington Capital Group and JPMorgan. Taken from Geanakoplos (2010).

Notes: The chart shows the average margin required by dealers on a hypothetical portfolio of bonds. The percentage margin axis is reversed, since lower margins are correlated with higher prices. The portfolio evolves over time and changes in average margin reflect changes in composition as well as changes in margins of particular securities. In the period following August 2008, a substantial part of the increase in margins is due to bonds that could no longer be used as collateral after being downgraded, or for other reasons, and hence count as 100% margin.

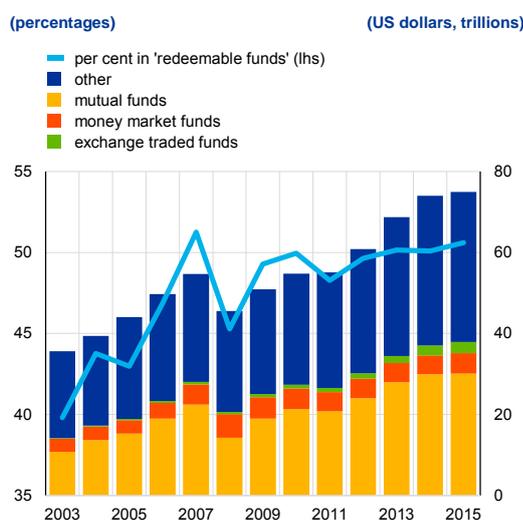
17. **Similarly, brokers and dealers may adjust haircuts in a procyclical manner.** To help investors trade larger amounts than they would otherwise be able to, a prime broker (often housed in the same firm as the dealer) may repo or reverse repo securities with investors. This is often done using overnight repos, although the securities subsequently purchased are intended to be held for longer periods, which would have been better funded with more stable term borrowing. In each case, the “haircut” on the repo limits the leverage available to the ultimate borrowers. If a prime broker perceives that the riskiness of securities increases, it raises haircuts, reducing the ability to use and re-use collateral and thereby limiting collateral velocity. In such cases, ultimate borrowers may be forced to liquidate positions, depressing asset prices and accentuating risk perceptions, further increasing haircut requirements and so forth. Figure 3 provides an example of procyclical haircuts on mortgage-backed securities during the global financial crisis.

¹³ Claessens et al. (2012).

¹⁴ Especially when underlying tax distortions that favour debt financing – i.e. the deductibility of interest payments in corporate taxation – provide incentives for debt over equity financing (e.g. Heckemeyer and de Mooij, 2014).



Figure 4
Global funds by redemption profile



Sources: International Investment Funds Association, Boston Consulting Group (2015), ICI Global (2016), TheCityUK (2015) and Bank of England.

Note: Total global funds refers to assets that are professionally managed in exchange for management fees. For all countries whose currency is not the US dollar, the average 2014 exchange rate is applied to all years. "Other" includes separately managed accounts, hedge funds and private equity. "Redeemable funds" is the sum of exchange traded funds, money market funds and mutual funds, as these typically offer investors the option to redeem at short notice.

18. **Reliance on less stable forms of funding, and related mismatches between assets and liabilities, can also occur in the investment fund industry.** Unlike bank depositors, investors in investment funds directly bear the losses of their investments, as funds are effectively a shared-ownership structure. Fund investors own an equity interest proportional to the amount of the fund's shares they own.¹⁵ For exchange-traded funds (ETFs), fund investors can trade their ownership claims on an exchange, while for traditional funds, fund investors can redeem shares according to the rules set out in the fund prospectus. Most open-ended funds aspire to make liquidity available on a daily basis, although they can temporarily decline to do this in stressed market conditions without defaulting on their legal obligations. Many fund managers have tools available to manage liquidity, including swing pricing, redemption fees and gates, or a suspension of redemptions. However, where underlying assets are relatively illiquid, a liquidity mismatch increases vulnerabilities.¹⁶ Figure 4 shows that the proportion of open-ended funds in the global

asset management industry has risen since 2003, especially due to the rise of mutual funds and ETFs. Data on the proportion of these funds with access to different types of liquidity management tools are not available at a macro level.

19. **Besides time-varying risk, it is also important to monitor and address cross-sectional risks that may emanate from non-bank entities.** Links between financial institutions and with financial market infrastructures can be a source of systemic risk:

- Interlinkages between entities may reduce the system's ability to withstand stress. Direct and indirect contagion channels, e.g. as a result of long intermediation chains created through securitisation, can amplify common shocks.
- Step-in risks may materialise when banks provide financial support to non-bank entities beyond any contractual obligation to do so (BCBS, 2015).
- Some non-bank entities or specific markets may become "too big to fail", creating misaligned incentives.

¹⁵ Nonetheless, Rajan (2006) argues that funds are subject to an agency problem. Because fund investors have incomplete information, they often use recent returns to judge the fund manager's acumen, which can create self-reinforcing fund flows. Recently, Goldstein et al. (2016) find evidence that corporate bond funds are especially vulnerable to run risks, as the relative illiquidity of corporate bonds benefits fund investors who sell quickly and thus increases the first-mover advantage.

¹⁶ An example of a suspension to avoid the selling of large amounts of illiquid assets in a short period is Third Avenue Management, which suspended redemptions from its credit fund in December 2015 when faced with large redemption requests. The recent suspension of redemptions in a number of UK property funds is a further example.



20. **Financial markets are made up of complex dynamic networks, which expand in good times, but may break down in bad times.** Systemic risks can build up in securities markets including those for bonds and equities as well as asset-backed securities (ABSs), whose cash flows are linked to those of underlying assets, such as residential or commercial mortgages or other loans.¹⁷ Transactions in these securities may lead to complex interlinkages, as seen with many sub-prime residential mortgage-backed securities during the recent crisis, whose claims on the underlying assets were prioritised.¹⁸ These securities may also be used as collateral in a wide variety of transactions, and their pricing affects payouts in derivative contracts. These factors lead to a host of direct and indirect links between financial market participants that are not always visible in standard (on-balance-sheet) financial reporting.¹⁹
21. **In a market-based financial system, indirect contagion channels are likely to be strong.** Indirect contagion through asset price changes and related behavioural responses played a key role in the 2007 sub-prime crisis and the 2010-12 sovereign debt crisis. The key channels of contagion operate through asset price changes, measured risks and marked-to-market capital of financial institutions.²⁰ In a market-based financial system, many financial entities value their assets and liabilities at fair value.²¹ As a result, systematic asset price shocks transmit instantaneously through the non-bank system. This may cause second-round effects as a result of deleveraging, crowded trades and market illiquidity (ESRB, 2015a).
22. **Most financial market infrastructures are systemically important.** Mandatory clearing of standard derivatives through CCPs increases transparency and the stability of the network. But it also creates new networks and concentration risks at CCPs. Due to their central position in the network, CCPs are generally understood to be systemically important.²² Furthermore, central securities depositories (CSDs), securities settlement systems (SSSs), trade repositories (TRs), certain payment systems²³ and certain trading venues (exchanges or other trading platforms) are systemically important due to their central role in the functioning of financial markets.
23. **The systemic importance of individual asset managers is still under discussion.** Over the past years, the asset management sector has become more concentrated, with the top 10 institutions controlling 28% of assets under management, compared with 22% by the largest 10 global banks.²⁴ There are concerns that the concentration of securities in the hands of large institutions increases financial fragility.²⁵ To address the potential risks, the FSB and

¹⁷ These markets are supported by market-makers, who are key to the smooth functioning of trading. Market-makers facilitate trades by buying when an investor wishes to sell and selling when an investor wishes to buy. They subsequently look to offset the positions they acquire by making opposite trades with other investors or other dealers.

¹⁸ Shin (2010).

¹⁹ Moreover, there are a number of initiatives at the national level aimed at improving data availability for some segments of the non-bank financial sector. For example, the Central Bank of Ireland is planning to increase oversight of the OFI sector through the extension of reporting requirements to special-purpose vehicles (SPVs) not primarily engaged in securitisation activities (see Godfrey et al., 2015).

²⁰ Adrian and Shin (2008).

²¹ There are exceptions. For instance, for many national insurance sectors, fair value calculations were only introduced as of 2016 with Solvency II. Some countries maintain at-cost statutory accounting alongside Solvency II.

²² See Wendt (2015).

²³ These are generally large-value payment systems but may also comprise retail payment systems. Besides systemically important payment systems, the CPSS-IOSCO Principles for Financial Market Infrastructures (PFMI) assume that "all CSDs, SSSs, CCPs, and TRs are systemically important, at least in the jurisdiction where they are located, typically because of their critical roles in the markets they serve" (PFMI, 2012, Section 1.20, p. 20).

²⁴ Haldane (2014).

²⁵ Massa et al. (2015).



the International Organization of Securities Commissions (IOSCO) are working on a framework to identify non-bank non-insurance global systemically important financial institutions.²⁶ Whether a framework for asset managers will be developed is conditional on whether the FSB identifies residual risks that cannot be addressed by measures targeting activities in the asset management sector. Once the FSB work has been finalised, EU authorities should consider whether additional elements are necessary to address the externalities posed by systemically important asset management activities in the EU.

24. **Insurance may be systemically important through different channels.**²⁷ At the current juncture, the common vulnerability to a “double hit” from low interest rates and declining asset prices is seen as the most prominent systemic risk. Because this risk could lead to collective failures in the sector, priority is currently given to the development of recovery and resolution frameworks for insurers. Other potential channels include risks from so-called non-traditional and non-insurance (NTNI) activities and procyclicality. The procyclicality channel stems from an increased reliance on market valuations in Solvency II and is conceptually similar to the procyclical behaviour linked to market valuations at other financial institutions. However, it should be stressed that Solvency II includes several measures aimed at reducing artificial volatility, avoiding fire sales and reducing procyclical behaviour in periods of stress.
25. **Non-bank financial institutions can cause financial instability on their own account and through links to traditional banks.**²⁸ While losses borne by individual investors may not, in isolation, have a systemic impact, interactions between investors and intermediaries may create contagion, particularly if concentrated in an overexposed sector. A sudden withdrawal of non-banks involved in credit provision in a particular sector may trigger a credit crunch, unless other lenders readily step in. These effects may occur irrespective of whether the core banking system remains healthy or not in the event of stress – although banks would likely be affected by asset price falls and a real economy recession. Interconnections between the banking and non-banking sector could amplify financial instability, as stress in non-banks has direct effects on banks’ direct or indirect exposures.
26. **In sum, the non-bank sector is not immune to market failures, externalities and systemic risks.** The impact, sources and transmission channels, however, vary substantially across sectors. In its policy framework for addressing risks from shadow banking entities, the FSB (2013) recognises risks emerging from credit creation, leverage, and maturity and liquidity transformation. These risks from non-bank entities are related to the first two intermediate objectives defined by the ESRB.²⁹ In this context, Figure 5 connects four intermediate objectives set out by the ESRB to the well-known concept of banking crises and to the broader concept of systemic crises, which also incorporates disruptions in the non-bank financial sector. On this basis, Box 1 contains a brief summary of systemic risk monitoring and stress testing beyond banking.

²⁶ FSB (2015a).

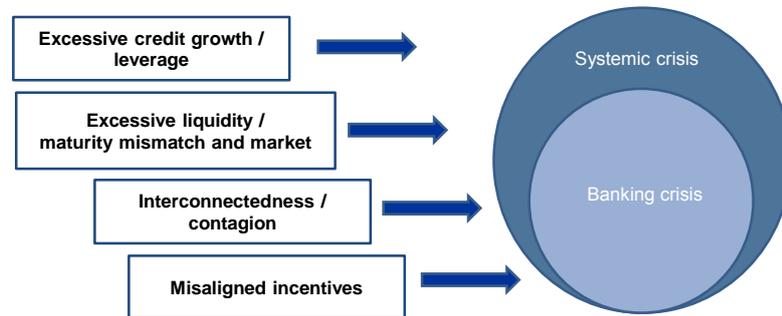
²⁷ ESRB (2015b).

²⁸ See EBA (2015) for a summary of the results from a data collection on EU banks’ exposures to “shadow banking entities”.

²⁹ These “*economic functions (or activities)*” are: (i) management of collective investment vehicles with features that make them susceptible to runs; (ii) loan provision that is dependent on short-term funding; (iii) intermediation of market activities that is dependent on short-term funding or on secured funding of assets; (iv) facilitation of credit creation; and (v) securitisation-based credit intermediation and funding of financial entities. Moreover, FSB (2015) highlights risks from systemically important non-bank financial institutions, although work in this area is currently on hold to focus on vulnerabilities from the activities of asset managers.



Figure 5
Systemic crises in a broader context³⁰



Source: ESRB.

Box 1

Systemic risk monitoring beyond banking

Systemic risk monitoring relates to the whole intermediation chain between lenders and borrowers in the financial system (Table 1). Excessive credit/leverage, liquidity mismatch, interconnectedness/contagion and misaligned incentives can create problems irrespective of the type of entity under consideration. In a similar manner, debt burdens can become problematic for end-borrowers, independently of the type of credit extended (whether in the form of bank loans, non-bank loans or bonds).

Systemic risk monitoring would benefit from aggregate and sector-specific indicators. Next to aggregate financial cycle indicators, system-wide measures of the intensity of risk per sector could be developed to allow policy to focus on those sectors that contribute most to systemic risk. In addition to banking, it is likely that market-based finance (including open-ended investment funds), insurers, pension funds and financial market infrastructures such as CCPs will make a relevant contribution to overall systemic risk. Such an approach could allow monitoring of risk shifting to or from different sectors, for example as the size of a sector grows. Such risk indicators could be complemented with sector-based indicators of resilience, which could be linked to a resilience standard.

³⁰ See ESRB (2013). The objective “resilience of financial infrastructures” has been excluded, as financial infrastructures are judged by the authors to be a part of the financial system and subject to the risks in the other four intermediate objectives.



Table 1
Examples of indicators

	Limiting systemic risk due to:				
	<i>Excessive credit growth / leverage</i>	<i>Excessive liquidity / maturity mismatch and market illiquidity</i>	<i>Interconnectedness / contagion</i>	<i>Misaligned incentives</i>	
Examples of indicators	Trends in corporate and household debt	Financial cycle measures; credit gap for bank, non-bank and total credit; leverage at AIFs and UCITS	Liquidity mismatches at investment funds	Network indicators Contagion measures	Size, complexity and interconnectedness of non-bank financial institutions

Stress testing for the entities outside the banking system can play an important role in risk monitoring beyond banking. Stress testing by institutions should be complemented by top-down work by regulators. In particular, stress tests for asset managers and funds, financial market infrastructures including CCPs, insurers and pension funds need to be developed further and carried out in a more holistic fashion, modelling the transmission of shocks across sectors. This would also allow for a comparison of potential tools within the stress test to address shortfalls revealed by the exercise. These tests can build on existing national and European initiatives, such as those of the European Insurance and Occupational Pensions Authority (EIOPA) and ESMA.

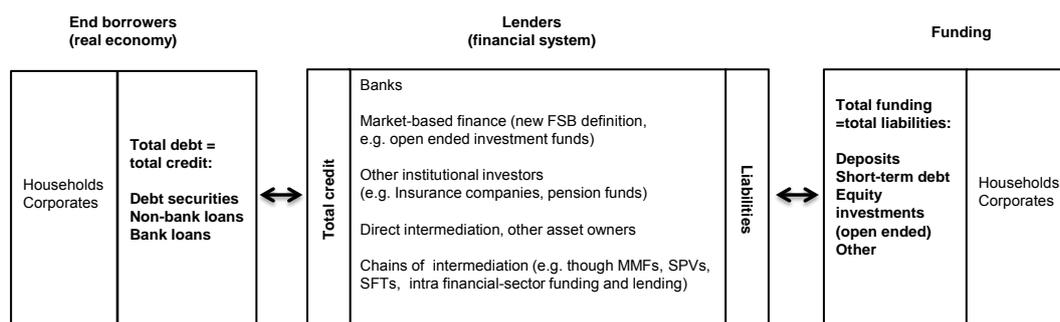


Section 3

Policy options to address systemic risks from non-bank intermediation

27. **A holistic approach for banking and beyond implies targeting risks with a consistent set of instruments across the whole financial system, commensurate with the contributions of entities and activities to systemic risk.** This section describes a consistent macroprudential policy for non-bank credit intermediation. The activation of tools requires a cost-benefit analysis that takes a system-wide perspective and examines the impact of policies on short-term and longer-term developments in the economy and financial system. The possible costs of actions, such as any short-term impact on credit growth, have to be traded off against potential longer-term resilience benefits, such as a reduction in the probability and severity of financial crises. Instruments need to be tailored to the entity or activity that is targeted and interdependencies need to be taken into account. Yet as a basic rule of thumb, macroprudential regulation should be more intensive in those sectors where systemic risk is higher and less intensive where systemic risks are limited.

Figure 6
Credit intermediation by banks and beyond the banking sector



28. **Macroprudential policies apply either at the lender (or intermediary) level or at the borrower level.** Tools targeted at lenders seek to mitigate the systemic risk created by the intermediary, separate from the end-borrower. By contrast, tools targeted at the end-borrower seek to limit the risks related to the end-borrower and thus need to be comprehensive, covering credit from all intermediaries. In particular, tools to avoid overindebtedness need to be broad-based and to comprise credit from all sources (i.e. all loans and debt securities). For example, household leverage can be limited with inclusively defined LTV ratios, and corporate leverage can be limited with measures of overall debt to earnings (as in the US – see below). Tools targeted at lenders or intermediaries are generally implemented through entity-based regulation, while those targeted at borrowers are usually implemented through activity-based regulation. But this may not always be the case beyond banking: for example, margin and haircut requirements apply to intermediaries but can be implemented through either entity-based or activity-based regulation.



Figure 7
Instrument design for non-bank intermediation

		End borrowers (real economy)	Lenders (financial system)			
		Excessive leverage	Credit growth	Excessive maturity/ liquidity mismatch and market illiquidity	Interconnectedness/ contagion	Misaligned incentives
Examples of instruments	Entity-based	Limits on <u>bank</u> debt for households or corporates Limits on <u>total</u> debt for households or corporates (e.g. caps on LTI/ debt to EBITDA) Limits on mortgage/ leverage finance transactions (e.g. LTV caps, caps on leveraged loans), independent of the type of lender (e.g. bank or non-bank loan)	Capital/ leverage requirements by type of lender (possibly time-varying) Minimum or countercyclical margin and haircut requirements that apply to both centrally cleared and non-centrally cleared transactions	Requirements related to maturity / liquidity mismatch by type of lender (e.g. limits) Instruments for increasing the resilience against large outflows (including redemption fees and gates where appropriate)	Large exposure restrictions Diversification requirements	Systemic risk surcharges Recovery and resolution tools (RRPs) ¹
	Activity-based					

¹⁾ While these measures are not strictly speaking of a macroprudential nature they typically have a macroprudential dimension which is reflected in their systemic wide stabilising effects.

29. **Both entities and activities can be regulated (Figure 7).** Much of the existing prudential and market conduct regulation already addresses entities. But excessive credit and leverage can also be built up through collateralised transactions and derivative transactions, and overindebtedness at the end-borrower level is often addressed through activity-based measures. The practical challenge is to set the right mix of entity and activity-based regulation. Generally, activity-based regulation that captures the underlying function is less prone to leakages than entity-based regulation that relies on legal definitions of the entities within scope.

Lender-based instruments

30. **Investment funds that do not use debt may still build up leverage.** On the asset side, synthetic leverage can be created through derivatives (ECB, 2015a). Moreover, the liabilities can be non-permanent, especially for open-ended funds (where liabilities are redeemable on demand to the extent that it is possible under the specific terms of the fund). First movers could have an advantage as they may still be paid out fully though losses may have already occurred.
31. **Macroprudential margin and haircut requirements can limit procyclicality and constrain the build-up of leverage via SFTs and derivatives.** Larger margin or haircut requirements set by authorities would improve the financial strength of parties to a transaction during periods when risks may be underpriced. Indeed, setting margins and haircuts in a conservative or countercyclical manner may help to contain the build-up of leverage as well as reduce the impact of margin calls during stress events.³¹ The setting of margins and haircuts requires a broad regulatory scope.³² Application to counterparties at transaction level has

³¹ See Brumm et al. (2015), Murphy et al. (2016) and Special Feature A in ECB (2016). Further work is needed on the calibration of margin and haircut levels and indicators to trigger policy action. In addition, further work could be undertaken on whether authorities could be given intervention powers to prevent contracting parties from belatedly pushing up margins and/or haircuts at the peak of stressed market conditions if this would only reinforce a spiral of procyclical behaviour. Three ESRB working groups are currently cooperating to investigate these issues.

³² For example, SFTs may be replicated with derivatives, or with direct purchases and sales of securities in margin accounts.



therefore been proposed (ECB, 2015b). An approach that differentiates between centrally and non-centrally cleared transactions might lead to substitution effects. These may partly be intended, to provide incentives for central clearing, but macroprudential instruments should in principle apply to all economically equivalent transactions.

32. **The development of instruments to address liquidity mismatches in asset management is high on the policy agenda of the ESRB and FSB.** Liquidity requirements can reduce liquidity mismatch and enhance the resilience of funds to redemption pressures. For example, required liquidity buffers can ensure that funds have access to sufficient liquidity to meet short-term redemption requests by investors in a stress scenario. Liquidity management tools such as redemption fees and redemption gates may ease redemption pressures, although – depending on their exact properties – they could lead to concerns about a first-mover advantage. Redemption gates can help put a quantitative limit on the magnitude of investor redemptions on a certain day, while redemption fees provide a price incentive against outflows.³³ Redemption terms should also be linked to the liquidity structure of a fund (see e.g. Article 16(2) of the AIFMD). Funds can choose a structure that ensures that investors can only redeem their investment according to a predefined timeline, which is more aligned with the maturity or liquidity profile of the underlying assets.
33. **Restrictions on large exposures, add-ons for systemically important institutions and recovery and resolution plans are also not unique to banking.** For example, FSB (2015a) already highlights risks from systemically important non-bank financial institutions. Recovery and resolution plans are being developed for insurers and CCPs, just as they have been for banks.³⁴ In sum, the ESRB and FSB have converged to conceptually similar approaches that stress the need to address similar systemic risks in a similar manner across sectors, entities and activities.

Borrower-based instruments

34. **Broad-based limits for end-borrowers should target all sources of credit, regardless of the provider.** Both corporate credit and household credit are provided by a range of sources and from different countries. For example, following the financial crisis, corporate credit has shifted towards market-based bond financing. Likewise, funds for commercial real estate projects are provided by different entities. This includes credit from banks, insurers, pension funds and investment funds and equity from real estate investment trusts (REITs; legally an alternative investment fund or AIF). Similar to haircuts for SFTs, loan-to-value (LTV), interest coverage ratio (ICR) or debt service-to-income (DSTI) limits would ensure the posting of sufficient collateral to counter the build-up of excessive leverage (ESRB, 2015d). Limiting excessive debt levels encourages equity funding, which is generally more stable and preferable from a financial stability perspective.
35. **For example, regulators in the United States have issued interagency guidance on leveraged lending.**³⁵ Transactions where the borrower's total debt divided by earnings before

³³ If the imposition of fees and gates is at the discretion of the fund manager, funds could be susceptible to preemptive runs. For a theoretical model describing this channel, see Cipriani et al. (2014).

³⁴ Current work on CCPs aims to ensure they are appropriately resilient, such that recovery/resolution is required only in the most extreme scenarios. This involves a tightening of current microprudential standards for CCPs.

³⁵ See <https://www.federalreserve.gov/bankinforeg/srletters/sr1303a1.pdf>.



interest, tax, depreciation and amortisation (EBITDA) exceeds six would generally raise concerns for most industries. This interagency guidance applies to supervised financial institutions, and therefore appears to have led to substitution effects towards less-regulated forms of intermediation.³⁶ In principle, such a measure could also be designed from an end-borrower perspective, which would make it more effective.

36. **The scope of debt limits for end-borrowers, i.e. corporates and households, and the potential for leakage require further attention.** For example, in some countries current LTV limits apply to banks only, while in others they apply to all credit providers that perform a certain activity, i.e. providing mortgage credit to households (Table 2). A broad scope appears particularly relevant in countries where non-bank and/or foreign mortgage credit represents a substantial part of total mortgage credit.

Table 2
LTV regulation across the EU: differences in scope of application

Domestic banks	Domestic banks + foreign branches	All providers of credit to households
Bulgaria Italy Poland Slovakia Spain	Cyprus Lithuania Romania Sweden	Finland Hungary Latvia The Netherlands

Source: IMF GMPI Survey (2013).

Note: Countries not mentioned are not listed in the survey as having LTV limits.

³⁶ See Davidoff Solomon (2015).



Section 4

Macroprudential elements and gaps in existing EU legislation

37. **Recent legislative changes and current policy discussions suggest a gradual evolution towards a more holistic approach to addressing systemic risk.** By way of illustration, Table 3 shows how excessive credit and leverage can currently be mitigated, using a mix of national, banking and non-banking regulation. Historically, these regulations were mostly developed by country and sector. But policy initiatives at the EU and the international level over the past years have created a more comprehensive approach towards non-banking institutions (e.g. undertakings for collective investment in transferable securities or UCITS) and collateralised finance (such as the FSB minimum haircut framework).³⁷ More recently, discussions have started on differences in definitions of leverage and the role of synthetic leverage (ECB, 2015a).

Table 3
Macroprudential instruments (or instruments with macroprudential effects) for excessive credit and leverage and for procyclicality

End-borrower	Lenders			
	Banks	Investment funds	Insurance and reinsurance undertakings	Derivatives and securities financing transactions
National legislation: LTV/LTI caps for residential real estate Under discussion: LTV/LTI limits for commercial real estate (ESRB, 2015d)	EU: CRR/CRD IV: Countercyclical capital buffer Reporting and disclosure of leverage ratios Under discussion: Leverage ratio as a binding requirement Macroprudential use of the leverage ratio – including a countercyclical buffer mirroring the risk-based countercyclical buffer (ESRB, 2015a)	EU: alternative investment funds (AIFMD) Option to impose leverage limits EU: UCITS Directives: Borrowing up to 10% of assets allowed for temporary purposes; For UCITS using global exposure method, their exposure relating to derivatives limited to 2 times total net value of portfolio	Solvency II: Matching and volatility adjustment; Capital add-on ³⁸ ; Extension of recovery period	Under discussion: Minimum or countercyclical margin and haircut requirements (ESRB, 2015b; BCBS-IOSCO, 2015; FSB, 2015). ³⁹ Application should be to counterparties at transaction level including both centrally cleared and non-centrally cleared transactions (ECB, 2015b)

Source: Adapted from Schoenmaker and Wierts (2016).

38. **But the policy framework is not yet ready.** A range of options exists for operationalising the existing legislation beyond banking (see Table 4, which is based on a more comprehensive overview in the annex of the elements of the main EU directives and regulations with macroprudential implications). The table indicates that progress has been made over the past years in terms of data availability (e.g. based on the SFTR, MiFID/MiFIR, EMIR and Solvency

³⁷ Schoenmaker and Wierts (2015) provide an integrated approach with regard to leverage.

³⁸ To be applied by supervisors only in exceptional cases, e.g. if the risk profile of the company deviates significantly from the assumptions used for the calculation of the solvency capital requirement (SCR).

³⁹ Both EMIR and the draft Securities Financing Transactions Regulation do not at this stage provide for a macroprudential use of margins and haircuts by the authorities. EMIR does, however, contain minimum standards for CCPs that aim at addressing procyclicality (ESRB, 2015b).



II), but also in terms of instrument availability, such as the option to impose leverage requirements on AIFs.⁴⁰

39. **Current leverage limits for investment funds in the EU may not yet be effective.** While a large portion of assets under management of EU funds is subject to explicit or implicit leverage limits, current regulation still provides scope for creating leverage, which may give rise to systemic risk. In particular, a number of UCITS funds are only subject to Value at Risk (VaR)-type limits, which are not a measure of leverage and generally have procyclical effects. This occurs when market volatility rises and funds need to deleverage as they approach VaR limits. With regard to AIFs, there are no general leverage limits. Instead, funds are required to disclose maximum leverage targets. However, the AIFMD imposes additional reporting requirements on funds that exceed a leverage threshold of 300% under the commitment approach (with derivative exposures converted into equivalent positions in the underlying assets) and mandates supervisors to intervene when the creation of leverage creates risks to financial stability. While margin requirements for derivatives and haircuts on SFT collateral constrain funds' leverage, the levels of margins and haircuts are currently determined by market participants and generally not subject to minimum floors.⁴¹
40. **EU regulations for derivatives and SFTs do not yet provide for the macroprudential use of margins and haircuts by authorities.** EMIR contains minimum standards for CCPs that aim at addressing procyclicality, but both EMIR and the SFTR do not at this stage provide for the macroprudential use of margins and haircuts by authorities, although these regulations could be adapted to allow such use (ESRB, 2015e; ECB, 2015b). Work is underway at the ESRB to set out how such tools could work in practice. A comprehensive framework requires (i) the development of risk metrics, indicators and triggers, based on new data made available under EMIR and the SFTR; (ii) a design that complements existing regulation; and (iii) a broad scope to limit regulatory arbitrage among transactions, markets and jurisdictions.
41. **Although the AIFM and UCITS Directives contain liquidity requirements, further work may be needed on macroprudential liquidity regulation of investment funds.** AIFs are required to have redemption policies that are consistent with the liquidity profile of the investment strategy and to conduct regular stress tests under normal and exceptional liquidity conditions. UCITS are subject to detailed eligibility rules on minimum investment in liquid (transferable) assets. If they use a VaR model, they must also conduct stress tests. Yet particularly in the current low interest rate environment, the search for yield encourages greater investments in illiquid assets and a build-up of liquidity risks. There is a risk that macro-level shocks, such as an interest rate hike, could lead to widespread redemption requests by fund investors, especially in funds which hold a large proportion of (illiquid) debt securities in their portfolios. Where fund managers do not have adequate tools in place such as swing pricing, redemption fees or redemption gates, there is a risk that redemption pressures could lead to fire sales and substantial system-wide liquidity stress. Currently, there are insufficient data on the availability of such liquidity tools at a macro level. In this context,

⁴⁰ The AIFMD does not set leverage limits for substantially leveraged AIFs, but mandates supervisors to intervene with leverage limits when the use of leverage contributes to the build-up of systemic risk and the risk of disorderly markets. See Article 25(3) of the AIFMD.

⁴¹ Moreover, the BCBS-IOSCO over-the-counter (OTC) derivative margin requirement framework exempts counterparties with gross notional OTC exposures below €8 billion.



stress testing, based on severe but plausible top-down scenarios, could help authorities to gauge risks, and AIFs and UCITS to calibrate conservative liquidity management tools.⁴²

42. **Stress tests for asset managers and funds could also inform regulators how the policy framework for AIFs that gives authorities the power to suspend redemptions (pursuant to Article 46 of the AIFMD) could be operationalised.**⁴³ In the case of UCITS, the suspension of redemptions can be done both on the fund's own initiative or upon the request of the competent authorities (if this is in the public interest or in the interest of investors). It would need to be clarified how this tool could be employed from a macroprudential perspective. Further analysis could be done on whether certain (classes of) funds should introduce other ex-post liquidity management tools such as swing pricing practices, as provided for under the AIFM and UCITS Directives, or should better align their redemption profile with their asset holdings, i.e. become non-daily or closed-end funds.
43. **For insurers, the Solvency II regime does not include macroprudential tools and the development of such tools should be considered.** For example, improving on Solvency I, Solvency II requires both assets and liabilities to be marked to market. This comes with a higher volatility of the valuation of investments in long-term assets and thus of insurers' own funds. The matching and volatility adjustments aim to limit these fluctuations in order to reflect the long-term nature of the insurance business.⁴⁴ While the current approach is based on decreasing buffers in bad times, it does not foresee a build-up of buffers in good times. ESRB (2015b) therefore considers flexibility to require the build-up of resilience (e.g. capital or reserve add-ons). In addition, enhanced liquidity monitoring, a recovery and resolution framework for European (re)insurers and limits on NTNI activities are important macroprudential instruments for consideration.
44. **Recovery and resolution tools for insurers and CCPs are a priority.** Under a scenario of prolonged low risk-free rates and suddenly falling asset prices, there is a risk that life insurers in some countries could simultaneously come under stress. Current insurance guarantee schemes and recovery and resolution arrangements at national level may not be sufficient to handle such a stress episode. In this light, ESRB (2015b) considers proposals for a recovery and resolution framework for European (re)insurers. Meanwhile, CCPs are required to have in place transparent rules and appropriate contingency procedures to handle uncovered liquidity shortfalls resulting from any individual or combined default of its participants. Beyond this, recovery and resolution frameworks can mitigate misaligned incentives ex ante, by ensuring incentives for CCPs and their clearing members to pay close attention to the CCPs' risk management. Moreover, recovery and resolution tools would mitigate the spillovers of individual institution defaults to CCPs and other clearing members.
45. **For short-selling, EU authorities have powers to intervene in financial market activity.** The EU Short-selling Regulation of 2012 provides for reporting and disclosure of short-selling positions, and defines the framework for ESMA and national competent authorities to intervene in exceptional situations to reduce risks to financial stability stemming from short-selling. The regulation and the related delegated act define criteria and factors to be taken into

⁴² This should be based on work by the ESRB and national market supervisors.

⁴³ This may be a relevant policy measure for open-ended real estate funds and other open-ended funds with illiquid underlying assets. See IOSCO (2015) for a critical discussion of such tools based on recent case studies.

⁴⁴ The volatility adjustment is a constant addition to the risk-free curve and is based on a risk-corrected spread on the assets in a reference portfolio. The matching adjustment is a parallel shift applied to the entire basic risk-free term structure and can only be applied to a portfolio of life insurance obligations with an assigned portfolio of assets.



account in determining when adverse events or developments occur and threats arise. Nevertheless, these considerations could be reviewed to optimise the use of these instruments, while minimising unintended consequences for market liquidity and price discovery.

Table 4
Options for operationalisation and legislative review

Legislation	Operationalising existing policy with macroprudential implications	Options for legislative review
	ESRB members	Legislative authorities
AIFMD	Provide advice on the application of leverage limits to counter systemic risks and advise ESMA on operationalising leverage restrictions Provide advice on a consistent range of effective liquidity management tools in investment funds, including guidance on the application of redemption limits Provide advice on the consistent calculation and reporting of leverage Enhance risk monitoring based on new data, including on leverage, in association with ESMA	Adjust data requirements, e.g. on liquidity/maturity mismatch Develop consistent measures of leverage for the investment fund sector Increase consistency of leverage requirements across sectors Macroprudential use of liquidity management tools
UCITS Directives	Provide advice on the consistent calculation and reporting of leverage Provide advice on a consistent range of effective liquidity management tools in investment funds, including advice on the application of redemption limits Explore the use of current liquidity management tools for macroprudential purposes	Adjust data requirements, e.g. on liquidity/maturity mismatch Develop consistent measures of leverage for the investment fund sector Macroprudential use of liquidity management tools
MMF Regulation (Proposal)	Monitor compliance with the ESRB Recommendation on money market funds (ESRB/2012/1)	Establish political agreement building on the EU MMF Regulation
MiFID II/ MiFIR	Monitor the impact on market structure of trading obligations Monitor the impact on market liquidity of pre- and post-trade disclosure obligations	
Short Selling Regulation	Monitor the effects on volatility, liquidity and price discovery Develop a framework for notifications, disclosures and restrictions on short-selling and CDS transactions in exceptional circumstances	Revise based on evidence on effectiveness
EMIR	Enhance risk monitoring based on new trade repository data and forthcoming stress-test exercises	Implement elements for the macroprudential use of margins and haircuts
Securities Financing Transactions Regulation	Enhance risk monitoring based on new granular data (once available) Form a data hub on SFTs in the EU	Transpose FSB recommendations on minimum haircut requirements on non-centrally cleared SFTs Add elements for the macroprudential use of margins and haircuts
Solvency II	Use the tools available under the existing Solvency II framework to address systemic risks, e.g. stemming from the low interest rate environment Possible revisions to the UFR (ultimate forward rate) methodology	Based on evidence, consider the introduction of further macroprudential tools
Institutions for Occupational Retirement Provision (IORP) Directive	Monitor the effects of the low interest rate environment Monitor the outcome of the trilogue discussion on recovery periods and the requirement of being fully funded "at all times" vs. "at the time of inception" Monitor discussions on the systemic relevance of pension funds	
Capital Markets Union (Action Plan)	Develop financial stability framework jointly with Capital Markets Union	Develop financial stability framework jointly with Capital Markets Union



Section 5

Institutional setting

46. **The current legal basis for macroprudential instruments for use beyond banking is incorporated in different prudential and market conduct regulations.** National market supervisory authorities as well as ESMA play a major role in this context (see the annex). In addition, the ESRB can promote the development and implementation of macroprudential instruments by issuing warnings and recommendations, thereby contributing to a consistent application across the system as a whole.
47. **In the European System of Financial Supervision (ESFS), the European Supervisory Authorities (ESAs) cooperate to ensure harmonised supervision of the Union's financial system.** The ESAs and the national competent authorities are responsible for effective and consistent prudential and market conduct supervision. The ESRB, national macroprudential authorities and the ECB have responsibilities for macroprudential oversight. The need for close cooperation is reflected inter alia in cross-participation in decision-making structures and legal provisions on the exchange of information.
48. **The functions of macroprudential, microprudential and market conduct supervision all contribute to a more robust and sustainable financial system, as reflected in the set-up of the ESFS.** Macroprudential supervision takes into account interdependencies as well as the endogenous nature of systemic risk, and counters macro-level market failures leading to systemic risk. Microprudential supervision focuses on the soundness of individual financial institutions and thereby contributes to the stability of the system as a whole. Market conduct supervision addresses market failures and misaligned incentives due to differences in information available to different market participants. Its mission is to ensure investor protection and the integrity, transparency, efficiency and orderly functioning of financial markets, and in so doing also to contribute to the stability of the financial system (IMF, 2015; ESMA, 2015).
49. **Different perspectives can also lead to differences in views on policy calibration.** ESRB (2014) discusses possible differences in the calibration of capital buffers related to macroprudential and microprudential concerns. But differences can also arise between macro and micro perspectives on market-based finance. A case in point is the increase in haircuts on collateralised finance during a downturn. While understandable from the risk management perspective of an individual firm seeking to reduce its risks, such actions accentuate the price decline and make matters worse.⁴⁵ This illustrates how reasoned differences of opinion may emerge between microprudential supervisors who urge institutions to manage their individual risks and macroprudential authorities worried about system-wide effects.
50. **Decision-making that internalises all costs and benefits, based on shared responsibilities within the ESFS, is needed to bridge these differences.** A formal hierarchy of macro versus micro policy objectives has not been established in legislation. Cooperation is therefore needed to come to a holistic view on appropriate measures reflecting both macroprudential and microprudential considerations. In this context, the cross-sectoral focus and broad membership of the ESRB are advantages in developing macroprudential

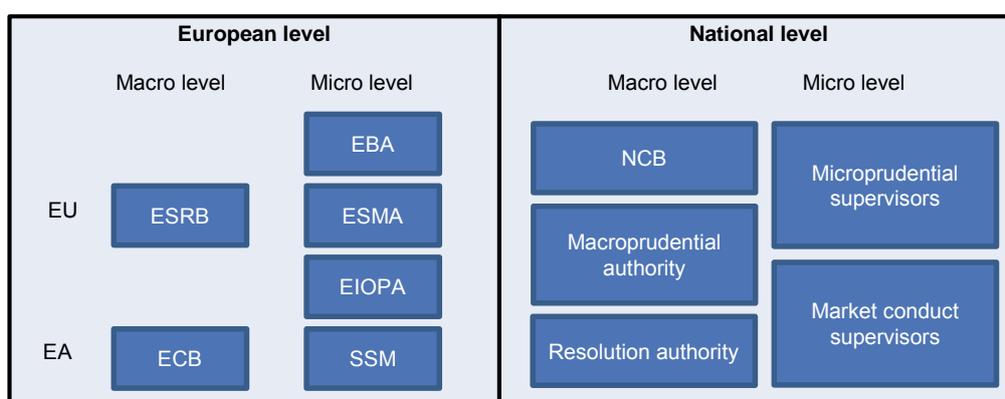
⁴⁵ See Shleifer and Vishny (2011).



policy beyond banking. This requires a wide set of expertise, skills and institutional involvement. The ESRB will draw on its full membership, covering supervisory expertise from all parts of the financial system.

51. **The ESRB's Recommendation on macroprudential mandates (ESRB, 2011) applies to systemic risks in the financial system as a whole.** It requires Member States to designate a macroprudential authority that monitors risks to financial stability, wherever in the financial system they arise, and that implements macroprudential policies. Moreover, Member States should ensure that the authority has control over the instruments for achieving its objective. The exact institutional setting is subject to national decision-making (Figure 8).

Figure 8
The institutional framework for financial regulation across countries



Notes: Institutions are arranged by the scope of their mandate. At the national level, functions are often combined within the same institution(s).

52. **In a globalised world, regulation is more effective if the core regulatory framework is based on internationally agreed standards.** Often, market-based finance operates in a global context, with close ties between financial centres. Moreover, non-bank entities such as asset managers and broker-dealers can have significant cross-border activities stemming from global activities (e.g. involvement in global OTC derivatives markets) and clients with a significant global footprint (e.g. global investment banks).
53. **The ESRB will promote a consistent application of FSB standards in the EU.** Whereas the Bank for International Settlements (BIS) plays a key role in developing global standards for banking supervision, the FSB works on transforming shadow banking into resilient market-based finance (FSB, 2015b).⁴⁶ Once standards have been transposed into EU legislation, the ESRB will promote a consistent application across the EU, so that differences in calibration are tailored to differences in systemic risk across countries and sectors.

⁴⁶ See e.g. FSB (2015b) for a recent update on transforming shadow banking into resilient market-based finance.



Section 6

The way forward

54. **The development of macroprudential policy beyond banking is a key policy priority.** As the non-bank financial sector grows and increases in systemic importance, it becomes more important to address financial stability risks beyond banking in a preventive manner. By mitigating market failures ex ante, authorities will reduce the probability of systemic crises, thus contributing to higher long-run growth and more sustainable market development. Implementing such a policy entails short-run costs, in the form of regulatory effort and constraints on the private sector's actions and potentially on short-term access to credit. Yet these costs are likely to be smaller than the costs of a systemic crisis, which disrupts financial system functioning, undermines confidence and may require the provision of public support to institutions or markets. While all regulation seeks to strike the right balance between the costs and benefits of policy intervention, there is a strong case prima facie for a prudent approach to systemic risks in rapidly changing and developing areas of the financial system.
55. **Looking ahead, the key elements of such a policy framework will take time to develop and implement.** With this paper and in follow-up work, the ESRB seeks to promote a strategy for macroprudential policy beyond banking, targeting risks across the whole financial system with a consistent set of instruments. The specific design and calibration of such instruments may differ across sectors, reflecting the different contributions of specific entities and activities to systemic risks, related to leverage, maturity and liquidity transformation, exposure concentrations, interdependencies and misaligned incentives. Getting the design of such instruments right will require significant work. One approach may be to develop an *aggregate standard of systemic risk and resilience* for the financial system as a whole and for individual sectors, such as market-based finance or the insurance sector.⁴⁷ Where such standards are developed, macroprudential instruments should be applied in line with the intensity of systemic risk. As a rule of thumb, macroprudential regulation should be more intensive in those sectors where systemic risk is higher, and less intensive where systemic risks are limited. Finally, authorities should be able to regulate credit at the level of end-borrowers, independently of the type of credit (i.e. bank loans, non-bank loans or marketable debt securities; domestic or cross-border). This requires a set of borrower-based instruments, which will complement the existing instruments based on lenders.
56. **Meanwhile, some measures can already be taken in the short to medium term.** Thanks to recent EU legislative reforms beyond banking, such as the AIFMD, Solvency II and EMIR, authorities have access to new data for alternative investment funds, insurers, derivatives markets and soon for securities financing (from the SFTR from 2018 onwards). These data allow authorities to gauge systemic risks and decide where policy action is warranted. In some areas, there is a legal basis for macroprudential instruments. For example, competent authorities can begin to operationalise limits on leverage for alternative investment funds – in close cooperation with ESMA, and drawing on ongoing analysis by the ESRB and FSB on the definition of leverage. Moreover, to contribute to ongoing discussions on the development of new macroprudential tools, authorities could use system-wide, top-down stress tests for asset managers and funds, financial market infrastructures including CCPs, insurers and pension

⁴⁷ See Cecchetti and Tucker (2015).



funds. Such system-wide tests should encompass all types of market participants and reflect the dynamics of the market. They could consider second-round effects and interactions, as well as current financial stability risks such as those emanating from the low interest rate environment. Where risks are identified, they should result in policy action, which may take the form of consistent macroprudential instruments that can be applied across sectors (taking into account interdependencies between sectors and their different contributions to systemic risks). Finally, the ESRB and its members should continue to analyse the impact of ongoing legislative reforms that influence the financial system, and to provide input to ongoing legislative reviews. This input should ensure that the macroprudential perspective is included in all relevant regulation.

57. **All of these tasks require cooperation among the ESRB membership.** While the specific mandates of the relevant authorities differ, they all share a commitment to promoting financial stability and sustainable welfare in Europe. The members of the ESRB have discussed the proposals in this paper, and – despite differences in perspective – have agreed to advance this agenda. Going forward, member institutions will cooperate on developing and operationalising macroprudential policy beyond banking, each contributing according to its own role, mandate and expertise. By working together, the members of the ESRB will continue to contribute to a safe, stable and diversified European financial system.



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Annex

Non-banking EU financial regulation with macroprudential elements

Legislation	Entry into force (latest revision)	Requirements for:		Existing elements with implications for macroprudential policy (non-exhaustive)		Competent authority	Legislative review
		Entities	Activities ⁴⁸	Existing elements	Articles		
AIFMD Directive 2011/61/EU	21-07-2011	Alternative investment fund managers (applies to AIFs indirectly)		Additional reporting requirements and frequency of reporting	Art. 24(5) and Commission Delegated Regulation (EU) No 231/2013 Art. 110(4)	National market supervisory authority ESMA (Art. 25(7), 47(4)(b) and (c) in accordance with 47(5), and 24(5) second subparagraph)	By 22-07-2017: EC review (Art. 69)
				Option to impose leverage requirements and other restrictions on management relating to the use of leverage	Art. 25(3) and (7) and Commission Delegated Regulation (EU) No 231/2013 Art. 112		
				Restrictions on non-EU AIFMs relating to management of AIFs	Art. 47(4)(b) and (c) in accordance with 47(5)		
				Appropriate and effective liquidity management systems and procedures	Art. 16(1) and Commission Delegated Regulation (EU) No 231/2013 Art. 46 in accordance with 47, and 45(3)(f)		
				Suspension of redemptions is universally available to all fund types	Art. 46(2)(j)		
			Requirement to have valuation procedures in place to be able to price assets at fair value	Art. 19(1) and Commission Delegated Regulation (EU) No 231/2013 Art. 60(2)(c) and 67(1)			
UCITS IV and V Directive 2009/65/EC (recast) Directive 2014/91/EU	07-12-2009	Undertakings for collective investment in transferable securities and their managers		Detailed eligible asset rules	UCITS IV Art. 50(1)	National market supervisory authority	
	17-09-2014			Fund manager should also be able to demonstrate that appropriate liquidity management processes are in place	Commission Directive 2010/43/EU Art. 40(3)		

⁴⁸ This means activities in terms of contractual transactions where an instrument can be applied to the contract.



				Borrowing up to 10% of assets may be allowed for temporary purposes	UCITS IV Art. 83(2)		
				Global exposure limit related to the use of derivative instruments and SFTs (up to 100% of the portfolio value; commitment approach or VaR)	UCITS IV Art. 51(3) and Commission Directive 2010/43/EU Art. 41(3)		
				Diversification limits	UCITS IV Art. 52		
				Redemptions may be temporarily suspended in exceptional cases	UCITS IV Art. 84(2)		
				Requirement to have valuation procedures in place to be able to price assets at fair value	UCITS IV Art. 85 and Commission Directive 2010/43/EU Art. 8(3)		
MMFR Proposal for a Regulation on Money Market Funds	04-09-2013: EC proposal 29-04-2015: EP negotiating position 10-06-2016: Council – Presidency proposal for general approach 17-06-2016: Council adopted negotiating position Negotiations ongoing (information therefore only preliminary)	Money market funds		Reporting requirements, additional information	Art. 38	National market supervisory authority	
				Stress testing and action plans	Art. 25		
				Internal assessment procedure for liquidity thresholds Liquidity management procedures for liquidity thresholds	EP position Art. 34b Council position Art. 29(1a)		
				Requirements for displaying a constant net asset value (NAV) per unit or share for low-volatility NAV MMFs	EP position Art. 27(4) and Council position Art. 27b(1)		
MiFID II/ MiFIR Directive 2014/65/EU (recast) Regulation (EU) No 600/2014	02-07-2014 03-01-2018: Date of application [as amended by Directive (EU) 2016/1034 and Regulation (EU) 2016/1033]	Regulated markets, investment firms, credit institutions, CCPs	Investment services; equity and non-equity instruments	Transparency: pre- and post-trade reporting and disclosure requirements	MiFIR Art. 3(1), 6(1), 10(1), 20 and 8(1), 18, 26 as amended by Regulation (EU) 2016/1033	National market supervisory authority (banking supervisory authority in some cases)	By 2019-2021: EC review of different elements of the MiFID II/ MiFIR framework (MiFID II Art. 90 as amended by Directive (EU) 2016/1034, MiFIR Art. 52 as amended by Regulation (EU) 2016/1033)
				Move OTC trading to trading venues	MiFIR Art. 28	Member State (MiFID II Art. 48(6) and 48(9), 57)	
				Rules on high-frequency algorithmic trading (e.g. risk controls)	MiFID II Art. 17(2), 17(5), 48(6) and 48(9)	ESMA (MiFIR Art. 28(2) and (5) in accordance with Art. 32)	
				Position limits for commodity derivatives	MiFID II Art. 57, 69(2)(j) and (p)		



SSR Regulation (EU) No 236/2012	25-03-2012	All natural or legal persons that enter into or have a short position in relation to the financial instruments covered by the Short Selling Regulation (SSR)	Short sales/short positions related to share capital of companies that have shares admitted to trading on a regulated market in the EU, Debt instruments issued by an EEA sovereign issuer	Disclosure regime for net short positions in EEA listed shares and sovereign debt Notifications/disclosure and restrictions on short selling and similar transactions as well as on sovereign CDS transactions in exceptional circumstances Ban on naked CDS positions in EU sovereign debt which do not serve to hedge exposure to the underlying debt	Art. 5, 6, 7 and 8, Commission Delegated Regulation (EU) No 918/2012 Art. 21 and Commission Delegated Regulation (EU) No 826/2012 Art. 2 and 3 Art. 18, 19, 20 and 21 Art. 14	National competent authority (Art. 14(2), 5, 7, 8, 18, 19, 20, 21 and 22) ESMA (Art. 28)
EMIR Regulation (EU) No 648/2012	16-08-2012	All users of derivatives (incl. financials and non-financials), CCPs and trade repositories	Reporting to trade repositories, Central clearing of OTC derivatives, Risk mitigation for non-centrally cleared OTC derivatives	Public disclosure Reporting to trade repositories ESMA stress test of CCPs Minimum standards for CCP margins that aim at limiting procyclicality Central clearing obligation for OTC derivatives Risk mitigation for non-cleared OTC derivatives	Art. 38(5) and 49(3) Art. 9 Art. 49 Art. 41 Art. 4, 5(2) and (3), 10(1), (3) and (4) Art. 11	National market supervisory authority ESMA (Art. 5(2) and (3), 10(4), 9(3) and 49(1)) 21-05-2015: Launch of EC review, Ongoing (Art. 85(1))
SFTR Regulation (EU) 2015/2365	12-01-2016	All users of SFTs incl. financials and non-financials, CCPs and trade repositories	Reporting of SFTs to trade repositories, Disclosure of SFTs by investment funds, Transparency of re-use	Increased transparency/data availability Request for information	Art. 12 Art. 9(1) in accordance with Regulation (EU) No 648/2012 (EMIR) Art. 61	National market supervisory authority ESMA (Art. 9(1) in accordance with Regulation (EU) No 648/2012 (EMIR) Art. 61) Within 36 months of entry into force of RTS on reporting obligations: EC review (Art. 29(1)) By 13-10-2017: EC review of progress at international level (including FSB recommendations for haircuts on non-centrally cleared SFTs) (Art. 29(3))
Solvency II (Omnibus II) Directive 2009/138/EC (recast) (Directive 2014/51/EU)	01-01-2016 [as amended by Directive 2013/58/EU] (23-05-2014) 30-09-2015: Amendment to Commission	Insurance and reinsurance undertakings		Capital add-on Volatility adjustment to address procyclicality (during stress times) Matching adjustment Symmetric adjustment in equity risk module	Art. 37 Commission Delegated Regulation (EU) 2015/35 Art. 49 and 50 Art. 106 and Commission Delegated Regulation (EU) 2015/35 Art. 172	National insurance supervisory authority (Omnibus II Art. 2(36)) By 2017-18: EC review of supervision of groups, capital management within a group (Omnibus II Art. 2(61) and Solvency II Art. 242 (2) as amended by



	Delegated Regulation (EU) 2015/35 (Commission Delegated Regulation (EU) 2016/467)		Extension of recovery period	Omnibus II Art. 2(36) [replacing Solvency II Art. 138(4)]	Omnibus II Art. 2(62))
			Ultimate forward rate	Commission Delegated Regulation (EU) 2015/35 Art. 47	By 31-12-2020: EC assessment of calculation of SCR standard formula (Omnibus II Art. 2(29))
			Restrictions or prohibitions of the free disposal of assets in stress times	Art. 138(5)	
			Symmetric adjustment mechanism for equity risk (capital requirement for equity risk)	Art. 106	By 01-01-2021 (or where appropriate earlier): EC report on long-term guarantee (LTG) measures and measures of equity risk (Omnibus II Art. 2(23))
IORP Directive Directive 2003/41/EC	23-09-2003	Institutions for occupational retirement provision	Technical provisions must be calculated in a prudent manner; the maximum discount rate shall be chosen prudently	Art. 15(4)	National insurance supervisory authority
	27-03-2014: EC proposal for recast of IORP Directive (IORP II)		Option to impose additional requirements for calculation of technical provisions	Art. 15(5)	Member State (Art. 16(2) and 15(5))
	28-06-2016: Council – Final IORP II proposal as provisionally agreed with EP Approval/ adoption process ongoing		Home member states may allow IORPs, for a limited period of time, to have insufficient assets to cover the technical provisions	Art. 16(2)	
STS Securitisation Regulation Proposal for a Regulation laying down common rules on securitisation and creating a European framework for simple, transparent and standardised securitisation	30-09-2015: EC proposal	Securitisation	Transparency	Art. 5	National market supervisory authority
	30-11-2015: Council – Presidency compromise		Due diligence	Art. 3	
	08-12-2015: Council adopted negotiating position		Disclosure requirements	Art. 22(3)	
	06-06-2016: EP – Committee draft report		Evaluate and address risks through appropriate policies and procedures	Art. 16(3)	
	Negotiations ongoing (information therefore only preliminary)		Risk retention rules	Art. 4	



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Postal address 60640 Frankfurt am Main, Germany
Telephone +49 69 1344 0
Website www.esrb.europa.eu

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