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"Non-Bank Finance and Financial Intermediation"

Non-Bank Finance: opportunities and risks

Speech by the Deputy Governor of the Bank of Italy
Luigi Federico Signorini

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Access to financial resources is essential for growth. The financial system channels resources through intermediaries and markets, allocating them within the economic system. The mix of banks, other intermediaries and market-based finance varies across countries and over time, depending on history, institutions, and stage of financial development, but certain common trends have emerged in the last decade.

Since the global financial crisis, the regulation of banks has been redesigned to address the vulnerabilities that led to accumulation of excessive risks. The reforms resulted from a reassessment of the role of banks in the post-crisis world, justified by the adverse systemic effects of their distress.

As banks' role has somewhat shrunk, non-bank financial intermediaries have taken on an increasing role in the global financial system.[1] At the same time, advances in technology have fuelled the emergence of technology-enabled financial innovation ("FinTech"), which is one of the areas where non-bank finance is expanding most rapidly.

A diversified financial system benefits savers and borrowers because it offers multiple ways of channelling financial resources, including to support long-term investment, and diversifying risks. The non-bank financial sector competes with banks, thereby stimulating efficiency and innovation. It can reduce the vulnerability of the real economy to financial shocks because funding sources for the real economy can be diversified.

At the same time, the expansion of non-bank finance poses new challenges to regulators, as the activities of non-bank financial intermediaries can have their own significant implications for systemic risk. In the case of the asset management industry, on which I shall mostly focus today, identifying, monitoring and preventing the build-up of risks from non-bank

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[1] Based on BIS data, in 2007 banks in the euro area accounted for 70 per cent of financing to the private sector,54 per cent in the United Kingdom, and 34 per cent in the United States; in June 2018 their share declined by 12 and 2 percentage points in the euro area and the United Kingdom, respectively, while it has remained unchanged in the United States, where it was lower. FSB data on total assets of financial corporations in 21 jurisdictions and the euro area show that the share of banks declined by almost 5 percentage points since 2007.

finance appears to require fresh thinking, more data, deeper analysis, and, quite possibly, new policy instruments.

FinTech opens financial intermediation and credit markets to new players and, at the same time, is bound to change the way traditional intermediaries operate. It can expand access to financial services, increase competition and efficiency, by lower transaction costs; but it may also mean that old risks take new forms and that new (or substantially increased) risks, such as cyber risk, arise. Detecting such evolving and emerging risks requires understanding and closely monitoring FinTech activities, especially with a view to closing regulatory loopholes: among them deviations from the key principle that the same risk should be subject, in effect, to the same regulatory and supervisory treatment, regardless of the nature of the agent and its technical means of operation.

There is substantial scope for international cooperation and coordination in these fields because developments in asset management and FinTech tend to cross borders quite easily. There is also a lot to be done in cooperation between different authorities. International coordinating bodies, such as the Financial Stability Board, are the natural *fora* for the authorities to elaborate common strategies.

I shall first review the benefits of non-bank finance; then I shall highlight the potential sources of systemic risk, particularly those from asset managers, and make some considerations about how they are being / should be approached by the supervisory authorities. I shall also touch upon the potential risks from Fintech. As testified by the agenda for these two days of discussion, these issues are relevant for countries facing very different economic and financial conditions.

The benefits of a diversified financial system

The role of non-bank finance in the global economy has been increasing, and is now at least as significant as that of banks. Data collected by the Financial Stability Board (FSB) show that at the end of 2017 the assets of non-bank financial intermediaries reached 180 trillion dollars, about 48 percent of the global financial sector's total assets; the assets of banks accounted for 39 percent of the total.[2]

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[2] FSB, Global Monitoring Report on Non-Bank Financial Intermediation 2018, 4 February 2019. The data refer to 21 countries and the euro area, and include insurance companies, pension funds and other financial intermediaries.

The non-bank financial sector includes a variety of intermediaries. Some of them perform credit intermediation functions, either issuing loans directly or facilitating credit provision through financial market instruments; others support equity financing in various ways. In certain business models, entities that intermediate market instruments engage in liquidity transformation, maturity transformation, and the creation of leverage just as banks do. These activities used to be referred to as "shadow banking" because they are usually subject to less stringent prudential regulation and supervision than banks. Last year the FSB decided to avoid using this definition, recognising that non-bank credit intermediation can be beneficial, provided its risks are appropriately monitored and regulated.

Activities that could generate bank-like risks are identified by the FSB under a narrow definition of non-bank financial intermediation, and include various entities, such as collective investment vehicles with features that make them susceptible to runs; finance companies engaging in loan provision that is dependent on short-term funding; market intermediaries that depend on short-term funding or secured funding of client assets (mostly broker-dealers); trust companies and structured finance vehicles.[3] The assets of these entities represent 14 percent of total global financial assets in the jurisdictions monitored by the FSB, and have grown by almost 60 percent since 2007.[4]

The importance of non-bank finance varies across jurisdictions, and depends, among other things, on the degree of financial development. Non-bank finance tends to be quantitatively more significant in countries with well-developed markets. In the United States, the assets of non-bank financial institutions account for 62 per cent of the total assets of financial corporations, exceeding those of banks. In the larger European economies the sector is less developed: the corresponding figure is about 35 per cent in France and Germany and below 30 percent in Italy and Spain. While in most emerging markets banks are still the largest sector of the financial system, in some of them non-bank finance has grown very rapidly.

Banks traditionally perform a key role in the financial system because of the monetary nature of their main funding source (deposits), and their

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3 The FSB definition based on economic function is described in its report on "Strengthening Oversight and Regulation of Shadow Banking: Policy Framework for Strengthening Oversight and Regulation of Shadow Banking Entities", 29 August 2013.

4 Data refer to 29 jurisdictions.

ability to bridge the gap between lenders and borrowers through the creation and accumulation of knowledge on the behaviour of the former and the creditworthiness of the latter. One of the advantages of banks with respect to other institutions is that they bundle different information-based products, exploiting synergies between payment services, liquidity provision and monitoring. There is an enormous literature to explain why banks exist, which I cannot even start to summarise here.

At the same time banks may be less efficient than other intermediaries in providing certain standardised services in isolation. While bundling can provide synergies and economies of scope, unbundling can allow specialised intermediaries to operate at a lower cost and to exploit other advantages of specialisation. FinTech is widely expected to enhance the ability of non-banks to challenge banks on this ground.

In other cases non-bank intermediaries profit from the ability to tailor their services to specific needs. In developing economies, to make one example, finance companies may be important, as they can cater to households and micro and small enterprises, improving financial inclusion; small loans are often bundled with the provision of liquidity services to clients that are too small to be profitable for banks.[5] To make another, quite different, example, bank loans might not be suitable – or available – to support businesses engaging in research and development as banks require collateral to mitigate risks; venture capital firms and private equity funds could be more effective in this specific domain.[6]

From the point of view of savers, collective investment vehicles, such as mutual funds and pension funds, provide investors with a wide range of investment options, with different risk-return profiles. Institutional investors such as insurance companies, and pension funds can focus on long-term "patient" finance more than banks, due to the nature of their liabilities.

Non-bank financial intermediaries also facilitate the deepening of financial markets. They channel savings towards market instruments,

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5 See A. N. Berger and G. Udell, "A more complete conceptual framework for SME finance", Journal of Banking and Finance Volume 30 (11), 2006, on the role of different lending technologies to address business opacity.

6 A survey of the role and distinct features of venture capital can be found in B. H. Hall and J. Lerner, "The Financing of R&D and Innovation", Handbook of the Economics of Innovation, Volume 1, 2010, Elsevier.

supporting issuers and providing liquidity and diversification to savers. Asset managers, and other entities that specialise in market finance, increase the efficiency and liquidity of capital markets, and investors' opportunities for diversification.

A vibrant non-bank financial sector increases competition in the financial system, reducing transaction costs and improving the quality of services. Incumbents, including banks, can see some of their advantages eroded as new players enter the market, exploiting economies of scale in specific business segments. Examples of this are institutions offering payment services or asset managers specialised in catering to the needs of investors with certain risk-return profiles.

New digital technologies are increasing the options for alternative providers of financial services, because they can be used to unbundle some of the services offered by banks. Technology-driven financial innovation can be particularly beneficial for developing countries because it makes services more affordable and accessible; but it can increase access to finance in advanced economies too. Thanks to technology there are greater opportunities to acquire and process information, reducing some of the traditional advantages of banks. Banks of course can adopt these technologies themselves, but non-bank entities sometimes are in apposition to exploit them more effectively, because they do not have to upgrade legacy systems and internal procedures; they can effectively "leapfrog" them.

Some see these developments as an existential threat to banks. The banks' future is linked to their ability to exploit the unique features of their core mix of activities to the full; but they need to evolve and adapt.[7] The benefits of physical proximity to clients afforded by the banks' traditional large, costly networks of branches, are becoming less important as savers and borrowers can access financial service providers remotely. Banks are in fact reducing the number of branches to cut costs. But in order to reap the benefits of technology they will need to go beyond cost-cutting and adopt farsighted and possibly quite far-reaching innovations in their approach to business and customers. Banks that are both creative and efficient in the use

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[7] See R.G. Rajan, "Why banks have a future: Toward a new theory of commercial banking", Journal of Applied Corporate Finance 9 (2), 1996; and A.W.A. Boot, "Banking at the crossroads: How to deal with marketability and complexity?", Review of Development Finance 1, 2011.

of technology, while preserving their traditional business advantages, are likely in my view retain a key role.

What is the optimal mix between banks, non-bank financial institutions and markets? The academic debate used to contrast intermediary-based financial systems with market-based ones, often looking for evidence that one or the other was superior. A more nuanced view is now usually held.[8] The optimal structure of the financial system is often found to change with economic development[9].

Whatever the nuances, I suppose most would nowadays agree that a balanced financial system with multiple, lively channels of financial intermediation is likely to provide both healthier competition and better resilience to shocks. Research has shown that when banks are distressed frictions in credit provision have negative real effects;[10] in countries that have well-developed markets, firms can borrow by issuing securities when banks tighten credit supply conditions.[11] On the other hand, banks can smooth temporary shocks affecting borrowers and somewhat shield them from financial market shocks by supporting financial flows, as suggested by the evidence from studies using microeconomic data on bank-firm relationships.[12] Cross-country evidence on various stages of the recent financial crisis has

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8 R. Levine, "Bank-Based or Market-Based Financial Systems: Which is Better?," Journal of Financial Intermediation 11 (4), 2002; for a review of the finance and growth literature see R. Levine, "Finance and Growth: Theory and Evidence," Handbook of Economic Growth Vol. 1, Part A, 2005.

9 A. Demirgüç-Kunt, E. Feyen, and R. Levine, "The evolving importance of banks and securities markets," World Bank Economic Review, 27(3). – As economies evolve, the benefit of further developing traditional financial institutions tends to decline whilst that of markets increases. Moreover, an IMF study shows that the relationship between financial development and growth is bell-shaped: financial development increases growth, but the effect weakens at higher levels of financial development, and eventually becomes negative. Considering sub-indices of an overall financial development index, this bell-shaped relationship is due only to the "depth" components of the index; "access" exhibits a positive linear relationship with growth, while "efficiency" has no robust association with long-term growth (IMF Staff Discussion Note "Rethinking Financial Deepening: Stability and Growth in Emerging Markets," 15/08, May 2015)..

10 G. Dell'Ariccia, E. Detragiache, and R. Rajan, "The real effects of banking crises," Journal of Financial Intermediation, 17 (1), 2008; R. Krozner, L. Laeven, D. Klingebiel, "Banking crises, financial dependence, and growth," Journal of Financial Economics 84, 2007.

11 T. Adrian, P. Colla, and H. S. Shin, "Which Financial Frictions? Parsing the Evidence from the Financial Crisis of 2007-9," NBER Working Paper No. 18335, 2012.

12 See for example E. Sette and G. Gobbi, "Relationship lending during a financial crisis," Journal of European Economic Association 13, 2015; P. Bolton, X. Freixas, L. Gambacorta, and P. E. Mistrulli, "Relationship and Transaction Lending in a Crisis," Review of Financial Studies 29 (10), 2016; W. Jiangli, H. Unal, and C. Yom, "Relationship Lending, Accounting Disclosure, and Credit Availability during the Asian Financial Crisis," Journal of Money, Credit and Banking 40 (1), 2008.

thus provided evidence for both views, which should therefore be seen as complementary rather than mutually exclusive.

Another key message from the research literature is that an overly rapid expansion of finance can lead to financial instability, especially if it is accompanied – as is often the case – by equally excessive leverage and risk-taking. This reconciles the long-standing view that financial development is beneficial for growth with post-crisis analyses suggesting that too much finance can be detrimental.[13] Stable growth is promoted by the ability of financial systems to provide financial services and perform their allocation function effectively, while keeping risks in check. This rather general and even obvious observation leads me to the second part of my speech, where I shall endeavour to make its implications a bit more specific, and thus also possibly a bit less uncontroversial.

The risks from non-bank finance: the case of asset management

Benefits do not come without costs. There would be little development without a financial system, yet the economic functions that the financial system performs, such as credit provision and maturity / liquidity transformation, imply the creation of risks. These risks not only affect the stability of individual financial intermediaries: they can also have an impact on the financial system as a whole, with adverse effects on the real economy. A long experience with banking informs the regulation and supervision of the risks generated by banks, imperfect as it will always remain; but as the financial system becomes more complex, risks take different forms and extend to different types of intermediaries; the authorities will need to adapt and evolve in response.

I shall focus here on the risks from one industry that I find particularly challenging from a supervisory point of view: asset management. This industry manages a very significant volume of assets, and influences the allocation of financial resources globally. It includes a variety of asset management models, and families of funds investing in products with different risk profiles. Some types of funds, like hedge funds, feature leveraged financial risk, which may

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[13] See J.L. Arcand, E. Berkes, and U. Panizza, "Too Much Finance?," Journal of Economic Growth, 2015; S. G. Cecchetti, and E. Kharroubi, "Why Does Financial Sector Growth Crowd Out Real Economic Growth?," BIS Working Paper, No. 490, 2015; S. H. Law and N. Singh, "Does too much finance harm economic growth?," Journal of Banking and Finance 41, 2014.

be further compounded by securities lending activities and the creation of synthetic leverage via derivatives.[14] Others, particularly open-ended funds, perform (among other things) liquidity and maturity transformation, because they invest in financial instruments that often have a longer maturity than the funds' shares.

Asset managers mostly provide investment services as fiduciary agents for their clients; hence, the risks associated with the investments are borne by the owners of the funds' shares, not by the fund managers. The risks that are traditionally of concern for the authorities mainly involve agency problems and information asymmetries between the investors and the asset managers (misconduct, lack of transparency in the behaviour of the asset managers or investors not fully understanding financial risks). Accordingly, the purpose of market regulation and the mandates of market authorities mainly concern conduct and transparency.

When markets function smoothly, liquidity and maturity mismatches can be managed because the asset managers deal with a large number of investors with diversified liquidity needs. In certain situations, however, the collective behaviour of investors can generate significant externalities, leading to excessive procyclicality, amplifying the cyclical properties of asset prices and credit flows. It is well understood that in financial markets procyclicality can be determined by behavioural phenomena (euphoria and panics), such as herding.[15] In the case of the asset management industry, procyclicality can be exacerbated by the pricing rules for fund shares, the incentive structure for fund managers and the benchmarking of fund performance.[16]

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[14] Some asset managers provide their clients with indemnification, a type of insurance associated with securities lending. When the borrower of a security defaults on the loan and the collateral received is insufficient to cover the repurchase price of the lent securities, the shortfall is borne by the indemnification provider.

[15] See for example D.S. Scharfstein and J.C. Stein, 1990. "Herd Behavior and Investment." American Economic Review 80; T. Lux, "Herd Behaviour, Bubbles and Crashes," Economic Journal 105, No. 431, 1995; and Shiller, R. J., "Conversation, Information and Herd Behavior," American Economic Review, Vol. 85 (2), 1995. For a review of the literature D. Hirshleifer and S. H. Teoh, "Herd Behaviour and Cascading in Capital Markets: a Review and Synthesis," European Financial Management 9 (1), 2003.

[16] Inflexible net asset value (NAV) fund share pricing, that does not factor in the investment losses of trading illiquid assets, can generate a first-mover advantage for an open-end mutual fund and exacerbate the incentive for investors to run. Benchmarking and relative performance mechanisms, which are common tools to address the principal-agent problem in the investment management industry, may lead to a focus on short-term returns and thus reduce the investment horizon of the manager. Incentive structures may increase risk-taking and short-termism by asset managers.

In times of stress the behaviour of investors can depress the prices of assets by pushing them well below their fundamental values. If investors fear that the liquidation value of their shares will decline as other investors liquidate their positions, they will have an incentive to redeem their shares. When they invest through funds, their joint behaviour could produce massive redemptions, putting pressure on funds. Funds will be forced to liquidate, with adverse effects on asset prices and market liquidity.[17]

Trades by large investors are more likely to turn into fire sales, magnifying the impact of temporary shocks on market prices and leading to severe liquidity stress and extreme volatility. As asset prices decline, other intermediaries holding those assets (including banks) face losses, collateral becomes less valuable and borrowers are affected, with negative consequences for the real economy.

Interconnectedness is another source of externalities from a systemic risk perspective. Externalities related to interconnectedness can arise because intermediaries are linked through bilateral balance sheet exposures or on the derivatives market, or because they are jointly exposed to common shocks. Ownership links between intermediaries might require the provision of liquidity support in case of fund distress, either because of existing guarantees or committed credit lines, but also with a view to avoiding reputational damage. For very large financial institutions the web of interconnectedness is highly complex and opaque.[18] Interconnectedness mitigates the impact of small shocks but can amplify large ones.

In asset management, a commonality of exposures can arise because the assets in which funds can invest are a finite set. Each fund holds a *diversified* portfolio but the portfolios of rationally-managed funds of a certain kind are not likely to be particularly *diverse*, as most if not all funds will use basically the same insights from finance theory and therefore follow similar investment strategies. If everybody in a market owns more or less the same portfolio and reacts in more or less the same way to disturbances, shocks can be amplified and spread more easily across markets and asset classes.

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17 Leveraged funds that rely on borrowing or derivatives may also be exposed to run-like behaviour if they cannot roll-over funding or positions when they are under stress.

18 J. Abad, M. D'Errico, N. Killeen, V. Luz, T. Peltonen, R. Portes, T. Urbano, "Mapping the interconnectedness between EU banks and shadow banking entities," ESRB Working Paper Series No 40, March 2017.

The real significance of these risk is the subject of an ongoing debate. There are many reasons to believe that they are not negligible, at the very least. Not only is the asset management industry very large, but it is also increasingly concentrated. According to one source the market share of the top twenty firms is more than 40 percent.[19] In the United States, the top 10 managers owned about 5 per cent of the United States stock market in 1980; in 2016 they owned about 23 per cent.[20] The commonality of exposures is substantial; evidence suggests that during stress episodes bonds with concentrated mutual fund ownership tend to experience larger price drops.[21]

Some other structural changes may further exacerbate the potential for externalities. First, the diffusion of funds with passive investment strategies, for example ETFs, could create distortions in the pricing of individual securities by applying mechanical investment rules, and thereby amplify trading patterns.[22] Second, automated trading may lead to less diversified behaviour in response to shocks, increasing the procyclicality of prices and liquidity.[23]

Applications of new technologies, such as high-frequency trading, algorithmic trading and robo-advisors, may improve market efficiency and reduce intermediation costs during normal times, but have the potential for making the behaviour of intermediaries (or, indeed, even individual investors in the case of robo-advice) more responsive to market news. More analytical work surely needs to be done, but available studies suggest that mutual fund investments affect price dynamics in less liquid markets, certain share pricing

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19 Data from "The world's largest 500 asset managers", Thinking Ahead Institute and Pensions & Investments joint research, based on 2017 figures for assets under management.

20 I. Ben-David, F. Franzoni, R. Moussawi, and J. Sedunov, "The Granular Nature of Large Institutional Investors", NBER Working Paper No. 22247, May 2016.

21 See Manconi A., Massa M. and Yasuda A., "The role of institutional investors in propagating the crisis of 2007–2008", Journal of Financial Economics 104. More recently, I. Ben-David, F. Franzoni, R. Moussawi and J. Sedunov, show that ownership by large institutions predicts higher volatility and greater noise in stock prices ("The Granular Nature of Large Institutional Investors", CEPR Discussion Paper 13427, 2019). The International Monetary Fund Global Financial Stability Report, April 2015, reviews available evidence.

22 See V. Sushko and G.Turner, "The implications of passive investing for securities markets," BIS Quarterly Review, March 2018, for a discussion of the issue. The evidence is ambiguous, see for example "The Shift from Active to Passive Investing: Potential Risks to Financial Stability?," K. Anadu, M. Kruttli, P. McCabe, E. Osambela, and C.H. Shin, Federal Reserve Board, FEDS WP 2018-060; also I. Ben-David, F. Franzoni, and R. Moussawi, "Do ETFs Increase Volatility?", NBER Working Paper No. 20071, April 2014.

23 IOSCO Research Report on Financial Technologies (Fintech), February 2017.

rules create first-mover advantage incentives, and the behaviour of portfolio managers displays significant herding tendencies.[24]

Countries with a small asset management industry and less developed financial markets are not immune to these risks. On the contrary, and maybe rather paradoxically, they could be even more subject to volatile capital flows as global players adjust their investment strategies, leading to surges in bond yields and sharp depreciation of the domestic currency.[25] There is evidence that international investors engage in more herding and momentum trading in emerging markets than in developed countries.[26] Large firms borrow from international markets, often in foreign currency, which exposes them to the refinancing and exchange rate risks from the reversal of capital flows.

Policy approaches to risks in non-bank finance

The externalities I have just described require a macroprudential approach. One of the lessons from the global financial crisis is that aggregate – i.e. systemic – risk can build up largely unchecked if authorities lack a broad perspective, and that the consequences of a crisis originating in financial markets may extend far beyond the fortunes of individual investors. The authorities in charge of financial regulation and supervision need to be able to monitor the potential sources of risks, to anticipate the build-up of systemic risk, and to deploy instruments to prevent it from materialising when possible; or, failing that, to mitigate their fallout.

As I already mentioned, traditionally the focus of the regulation and supervision of the asset management industry has been the conduct of these intermediaries, and its purpose has been to ensure integrity and transparency,

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24 See the International Monetary Fund, Global Financial Stability Report, April 2015. While most of the earlier literature focused on equity trading, the different features of other types of assets can result in different herd behavior. Analyses of herding in the U.S. corporate bonds among bond fund managers find that corporate bond herding is substantially higher than the stock market herding (e.g. Cai, F., Han, S. and Li, D., "Institutional Herding in the Corporate Bond Market," Board of Governors of the Federal Reserve System International Finance Discussion Papers No. 1071, December 2012).

25 E S. Prasad, K. Rogoff, S. Wei, and M. A. Kose, "Effects of Financial Globalization on Developing Countries: Some Empirical Evidence," IMF Occasional paper 220, 2003.

26 A number of studies focus on emerging markets, investigating the behavior of mutual funds, for a survey see G. Gelos, "International Mutual Funds, Capital Flow Volatility, and Contagion – A Survey," IMF WP/11/92, 2011; the evidence in the literature suggests that funds tend to avoid opaque markets and assets, and this behavior becomes more pronounced during volatile times, with portfolio rebalancing mechanisms contributing to explain contagion patterns. Also C. Jotiikasthira, C. Lundlbadand T. Ramadorai, "Asset Fire Sales and Purchases and the International Transmission of Funding Shocks,", Journal of Finance 67(6).

given the limited relevance of the risk of managers' insolvency. More recently, the focus on liquidity management has increased, but still mainly from the perspective of individual funds. These issues should continue to receive all the attention they deserve; but there seems to be a case that they need to be accompanied by a *macro*prudential approach. The authorities should assess how shocks originating in one part of the financial system can be transmitted to the others components, both directly and through their impact on markets.

This is a very challenging objective, requiring data and complex analytical frameworks. One tool that could be useful is macroprudential stress testing. The work on stress testing tools for non-banks is still in its infancy.[27]

An additional challenge is the identification and design of appropriate policy instruments. Tools aimed at protecting the stability of individual asset managers are available in many jurisdictions, for example liquidity requirements, rules restricting the amount of illiquid assets that can be held by open-end funds, redemption suspension and redemption gates. Their effectiveness for macroprudential purposes should be evaluated. Standards aimed at preventing the excessive accumulation of risk ex ante, such as minimum maturity-matching rules, are more effective in this sense than those meant to manage a fund's crisis ex-post, such as gates, which may even have counterproductive signalling effects. The former set of standards should in my view include mandatory rules to ensure that funds investing in illiquid assets beyond a certain share of their portfolios may not operate as open-ended funds.

Finally, the adoption of a macroprudential approach to the risks arising from asset management could require the adjustment of the institutional framework for financial supervision. In many countries, the authorities in charge of the regulation and supervision of these entities have no financial-stability mandate. Should their mandate be expanded to include financial stability? Given the cross-sectoral nature of financial stability risks, if several authorities are in charge of financial stability, how can the exchange of information and the coordination of policies be ensured? Incentives to redesign institutions are usually stronger in the wake of a crisis but tend

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[27] See the work by Y. Baranova, J. Coen, P. Lowe, J. Noss and L.Silvestri, "Simulating stress across the financial system: the resilience of corporate bond markets and the role of investment funds," the Bank of England Financial Stability Paper No. 42 (July 2017),. Also S. Calimani, G. Hałaj, S. Zochowski, "Simulating fire-sales in a banking and shadow banking system," ESRB Working Paper Series 46, 2017.

to wane during good times. Consideration of these issues should not be procrastinated until the next crisis.

Central banks play a key role in macroprudential policy because their mandate includes in one way or another a macroeconomic and financial stability perspective. They also have access to timely information as a result of monetary policy implementation. Finally, they have the unique ability to provide liquidity through banks. This proved crucial during the global financial crisis.[28] In designing the institutional framework for macroprudential policy, authorities should consider if the scope of the lender-of-last resort function should be expanded to include institutions other than banks. Under what circumstances, and how, should central bank intervene if the liquidity stress of a non-bank financial intermediary appears likely to cause contagion and disrupt markets?

International cooperation is necessary to avoid regulatory arbitrage. The FSB is the forum that is best suited to coordinating the any efforts to analyse financial stability risks stemming from non-bank finance, and to devise common approaches and regulatory standards. With its annual monitoring exercise the FSB provides the policymaking community with a framework for analysing risks, and a very useful source of data on non-bank finance; the coverage in terms of jurisdictions and the degree of harmonisation of the data have much improved in recent years.

The FSB issued policy recommendations in 2017 to address structural vulnerabilities in asset management activities, mandating the IOSCO, the relevant standard setter body, to operationalise them. This work has led to the development of policy tools for asset managers in the area of liquidity risk management, and of leverage measures for investment funds to facilitate monitoring for financial stability purposes and to enable comparisons across funds at the global level.[29] The FSB has also made some progress in studying the impact of large investors' strategies on market liquidity. In a recent pilot simulation exercise, the FSB employed a modelling approach to assess the consequences of market stresses and examined the resilience of liquidity across a range of corporate bond markets.[30]

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28 The central bank provided liquidity to mutual funds in the United States, to selected broker-dealers and central clearing counterparties in the UK. Similar arrangements were made by the Bank of Japan.

29 IOSCO, "Recommendations for Liquidity Risk Management for Collective Investment Schemes," February 2018.

30 The approach was an adaptation of a model of the Bank of England.

This line of action deserves to be brought further forward. There have been from time to time episodes of hesitations and reversal, such abandoning the idea of identifying globally systemic non-bank intermediaries (in my view an ill-advised move), some timidity in prescribing ex-ante liquidity rules, and now perhaps a sense that all that needed to be done has been done. The risks, however, are too new, too complex and too little understood for any complacency. Continued evaluation of the effectiveness of the available tools in a macro perspective, and increased coverage, as well as improved analytics, of systemic resilience testing, should in my view be actively pursued.

FinTech, regulation and systemic risk

FinTech, broadly defined, includes very diverse technology-enabled financial innovations encompassing the provision of a whole range of financial services, such as payments, insurance, lending and crowdfunding, trading and investment services.[31] FinTech is changing the landscape in which intermediaries and policymakers are operating, as new business models are developed by exclusively Fintech firms or by incumbents responding to competition.

FinTech activities can generate institution-specific risks, financial and operational, and systemic risks. The financial risks are not in principle different from those borne by other intermediaries, and depend on the business model adopted by the service provider. For example, some platforms providing FinTech-enabled credit directly match borrowers with lenders, acting as agents. If investments and loans are matched by maturity, and investors are unable to liquidate their investments before the loan matures, the platform bears no liquidity risk. Only a small proportion of platforms currently engage in leverage, as they use their own balance-sheet to fund loans.[32] These platforms are exposed to credit risk, like others that offer return guarantees, and could be subject to liquidity risk if investors can liquidate on short notice their positions.

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31 The IOSCO maps eight groups of innovations, considering also those in planning, data and analytics, and security. A mapping can be found in IOSCO, "Research Report on Financial Technologies (Fintech), 2017.

32 See the FSB-CGFS "Report on Fintech credit," May 2017.

Regulators and supervisors have to focus their lenses better in order to see more clearly the potential risks arising from each kind of Fintech activity and business model. There is one general principle that should inspire the way authorities tackle FinTech from a microprudential point of view: to the extent that FinTech activities involve the same risks that justify supervision of other activities, they should be regulated and supervised in much the same way. Following this principle also ensures a level-playing field between different institutions (i.e., banks and non-banks) performing the same activities. The current regulatory framework may or may not be adequate to ensure that this principle is followed; in many jurisdictions regulation of non-bank agents that engage in bank-like activities is lighter than that of banks, and many non-financial entities, large and small, appear determined to enter the financial-services field. Authorities should be prepared to evaluate on an ongoing basis the regulatory perimeter and the effectiveness of existing prudential rules.

Operational risk, while not unique to FinTech activities, is especially relevant for them, irrespective of whether they are performed by separate service providers or by banks or other, supervised, traditional intermediaries. Cyber risk is not a new phenomenon, but the diffusion of FinTech activities could increase the vulnerability of the financial system due to greater use of digital technologies, which raises the number of potential entry points for cyber-attacks.

Another source of operational risk is the reliance of banks and other intermediaries on services provided by third parties. FinTech activities, including those performed by traditional intermediaries, often involve outsourcing one or more functions or processes that are integrated into the value chain; these third parties could be outside the financial system, or within the financial system, but subject to lighter regulation and supervision. Reliance on third parties exposes FinTech activities to the risk of disruptions; furthermore, if these third parties manage confidential data, the legal risks may be substantial. FinTech innovations need to be carefully monitored to avoid that opportunities open up for illegal activities that could pose a threat to financial integrity.

These risks have potential implications for financial stability to the extent that their materialisation can trigger distress in an entire sector, or propagate significant stress to other sectors of the financial system and the economy. Developments in FinTech could also become important from a

macroprudential perspective if they have the potential to amplify shocks or create new channels of contagion as a result of externalities.

I already mentioned ways in which technology may enhance the amplification risk implicit in market intermediation. FinTech can also increase the risks of contagion arising from interconnectedness through several other channels. First, FinTech entities are connected with banks and other financial entities through partnerships or other joint ventures. Digital platforms in some cases intervene at some stage of the value chain of a given financial service. For example, they act as an interface between institutional investors and borrowers or provide screening services for banks. While specialisation of intermediaries in the different stages of credit intermediation may increase cost efficiency, it could also exacerbate agency problems. At this stage, reputation risk and a collapse in trust in one or more large FinTech entities might conceivably be a major source of contagion.

Second, digital technologies exhibit very significant economies of scale, which may drive consolidation in the financial industry and in financial market infrastructures, increasing concentration and leading to the emergence of a few systemically important players; similarly, third-party service providers may become fewer and larger, which increases the potential for exposure to common shocks.

While policies for microeconomic and financial risks from FinTech are currently defined by individual jurisdictions, there is significant scope for coordination[33]. Regulatory and supervisory authorities have the difficult job of protecting the safety and soundness of the financial system without curbing innovation. They may be tempted to impose unduly restrictive rules in response to the challenge they face, arising from the complexity and dynamism of technology. Or they could be tempted to lower standards to encourage innovation and attract business, leading to the exploitation of regulatory arbitrage by firms. In European jurisdictions the volume of investment in FinTech companies appears to be negatively correlated with the stringency of financial regulation.[34] While the optimal point in this trade-off may be difficult to find, it needs

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[33] Realistically, one has to recognise that national security concerns may in certain cases dictate limits to cross-jurisdiction cooperation in this field.

[34] Barba Navaretti, G., G. Calzolari and A.F. Pozzolo, "FinTech and Banks. Friends or Foes?", European Economy 2017 (2).

to be found; international cooperation is key to avoiding an excessive divergence across jurisdictions.

From a macro-financial perspective risks appear to be limited at this stage, but they could increase rapidly if the authorities lag too much behind the market in understanding technological and business developments. International cooperation in monitoring FinTech trends would be highly beneficial; assessing the material nature of the risks arising from FinTech is a difficult task because of the lack of data and experience.[35] The FSB is monitoring developments of FinTech in its annual review of non-bank finance, and has just released a report on decentralised technologies.[36]

Collaboration with the industry can be very useful. In April the European Commission and European Supervisory Authorities launched a new platform, the European Forum for Innovation Facilitators (EFIF).[37] Through this network, participating authorities can share experiences from their engagement with firms through innovation facilitators. The Bank of Italy will contribute its experience with its innovation hub.[38]

Given the cross-cutting nature of FinTech, international coordination on policies is already involving many institutions and standard setting bodies, each according to its mandate.[39] The FSB has identified two issues that deserve the authorities' attention from a financial stability perspective, and should be a priority for international cooperation: managing operational risks from third party service providers, and mitigating cyber risks. Many third party service providers are outside the regulatory perimeter, and the authorities should carefully evaluate whether the existing oversight frameworks are

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35 FSB, "Financial Stability Implications from FinTech, Supervisory and Regulatory Issues that Merit Authorities' Attention," 27 June 2017.

36 FSB, "FinTech and market structure in financial services: Market developments and potential financial stability implications," 14 February 2019.

37 The European Commission has developed a FinTech Action plan, as outlined in a document released in 2018 (see "FinTech Action plan: For a more competitive and innovative European financial sector").

38 FinTech Channel, accessible through the website, is a direct interface through active start-ups and firms that would like to offer technological solutions to banks and financial intermediaries, or the latter if they are directly involved in the development of innovative solutions in the area of financial services, can contact the Bank of Italy.

39 Initiatives have been launched by the Financial Stability Board (FSB), the Bank for International Settlements (BIS), the Basel Committee on Banking Supervision (BCBS), the Committee on Payments and Market Infrastructure (CPMI), the International Organization of Securities Commissions (IOSCO), the International Association of Insurance Supervisors (IAIS), the Financial Action Task Force (FATF). The IMF and World Bank have developed the Bali Fintech agenda in 2018, to guide its work and the dialogue with member countries.

appropriate. Cross-border coordination and collaboration may also involve authorities in charge of IT security, especially in the regard to cyber risk.

Finally, technology may also offer significant opportunities for authorities to improve their ability to protect financial stability. Many central banks and supervisory agencies are experimenting in this area.[40] At the Bank of Italy we are exploring the use of new technologies in supervisory activities: specifically, we are testing ways in which artificial intelligence can help in forecasting economic and financial variables, understanding changes in investors' sentiment, and improving the effectiveness of anti-money-laundering activities.[41]

Conclusions

A more diversified financial system, with banks and non-bank financial institutions complementing each other, can improve resource allocation and promote growth. Effective regulation and supervision have to ensure that non-bank financial institutions reinforce the financial system, and this requires understanding and managing the attending risks.

Certain types of non-bank finance could exacerbate the tendency of the financial system to behave procyclically, and increase the degree of interconnectedness between intermediaries and markets. Authorities should look at a possible macroprudential approach, and consider adjusting the policy framework accordingly, however challenging this may seem.

Although FinTech has not raised issues from a systemic risk perspective so far, the authorities need to be vigilant and constantly update their knowledge of how these activities are evolving, to harness the opportunities for innovation while keeping risks in check.

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[40] Some of the initiatives by early users are described in a survey-based analysis by D. Broeders and J. Prenio, "Innovative technology in financial supervision (suptech) – the experience of early users," Financial Stability Institute, FSI Insights on policy implementation, No 9 July 2018.

[41] Examples are M. Accornero and M. Moscatelli, "Listening to the buzz: social media sentiment and retail depositors' trust," Bank of Italy Working Paper No. 1165, 2018; M. Loberto, A. Luciani and M. Pangallo, "The potential of big housing data: an application to the Italian real-estate market," Bank of Italy Working Paper No. 1171, 2018; C. Angelico, J. Marcucci, M. Miccoli and F. Quarta, "Can We Measure Inflation Expectations Using Twitter?", Bank of Italy mimeo, 2019; L. Arciero G. Bruno, G, Marchetti, J. Marcucci, "Anomaly Detection in RTGS Systems: Performance Comparisons Between Shallow and Deep Neural Networks", Bank of Italy, mimeo, 2019; G. Bruno, J. Marcucci, A. Mattiocco, M. Scarnó and D. Sforzini, "The Sentiment Hidden in Italian Texts Through the Lens of a New Dictionary", Bank of Italy, mimeo, 2019.

Coordination and cooperation among central banks and market and supervisory authorities is of the utmost importance, not only to avoid negative spillovers across jurisdictions, but also because the exchange of knowledge and best practices yields concrete benefits when navigating such a rapidly changing world.

I thank you very much for your attention. The Banca d'Italia is delighted to host this event, and I wish everyone a very fruitful discussion.

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