

DISCUSSION PAPER SERIES

DP11822

REGULATION AND STRUCTURAL CHANGE IN FINANCIAL SYSTEMS

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FINANCIAL ECONOMICS



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Discussion Paper DP11822
Published 02 February 2017
Submitted 02 February 2017

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Abstract

Financial systems have undergone many changes over the past few decades due to real economic developments, advances in technology, globalization, shifts in regulatory paradigms, and the global financial crisis. As systems change, notably in information processing, trading, and interactions between banks and markets, the nature of market failures and sources of systemic risks alter. Longer-run regulatory trends, however, do not sufficiently acknowledge these shifts nor necessarily encourage types of financial systems (“financial structures”) that best serve economies in the medium term. To rebalance, the paper highlights the need in many countries for more non-bank forms of financing, notably equity markets, and calls for extending macroprudential policies’ reach to non-banks and ensuring more systemic oversight of non-bank markets, while revisiting the tendency to adopt bank-type regulations for non-bank activities.

JEL Classification: N/A

Keywords: N/A

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Acknowledgements

Paper written for the ECB Forum on Central Banking, June 2016. I would like to thank Tobias Adrian, Thorsten Beck, Arnoud Boot, Mark Carey, Asli Demirgüç-Kunt, Philipp Hartmann, Daniela Klingebiel, Nellie Liang, Stan Maes, David Marques-Ibanez, Arun Muralidhar, Zoltan Pozsar, Lev Ratnovski, Sunil Sharma, Manmohan Singh, an anonymous reviewer, the discussant, Hyun Shin, and conference participants for comments, Nicholas Coleman for extensive help with the estimations, and Michael Donnelly for excellent research assistance. I have also benefited from discussions with many colleagues at the Federal Reserve Board and others. Views expressed in this paper are those of the author and should not be attributed to the Board of Governors of the Federal Reserve System or any other institution.

Regulation and structural change in financial systems¹

By Stijn Claessens²

Abstract

Financial systems have undergone many changes over the past few decades due to real economic developments, advances in technology, globalization, shifts in regulatory paradigms, and the global financial crisis. As systems change, notably in information processing, trading, and interactions between banks and markets, the nature of market failures and sources of systemic risks alter. Longer-run regulatory trends, however, do not sufficiently acknowledge these shifts nor necessarily encourage types of financial systems (“financial structures”) that best serve economies in the medium term. To rebalance, the paper highlights the need in many countries for more non-bank forms of financing, notably equity markets, and calls for extending macroprudential policies’ reach to non-banks and ensuring more systemic oversight of non-bank markets, while revisiting the tendency to adopt bank-type regulations for non-bank activities.

1 Introduction

The main question this paper addresses is how to best adapt financial regulation and supervisory approaches to changes in real economies and financial systems. Changes in real economies arise from market forces, including real globalization (trade and investment), shifts in the sources of productivity and growth, and longer-run (demographic) trends. Changes in financial services provision relate to advances in technology, and continued financial innovation and globalization. Any adaption of regulation in the light of these changes should consider its longer-run trend, notably a move away from structure and conduct requirements, and towards emphasizing capital adequacy and fair value accounting, combined with public disclosure, as

¹ I would like to thank Tobias Adrian, Thorsten Beck, Arnoud Boot, Mark Carey, Asli Demirgüç-Kunt, Philipp Hartmann, Daniela Klingebiel, Nellie Liang, Stan Maes, David Marques-Ibanez, Arun Muralidhar, Zoltan Pozsar, Lev Ratnovski, Sunil Sharma, Manmohan Singh, an anonymous reviewer, the discussant, Hyun Shin, and conference participants for comments, Nicholas Coleman for extensive help with the estimations, and Michael Donnelly for excellent research assistance. I have also benefited from discussions with many colleagues at the Federal Reserve Board and others. Views expressed in this paper are those of the author and should not be attributed to the Board of Governors of the Federal Reserve System or any other institution.

² Federal Reserve Board, University of Amsterdam, and CEPR.

incentive and disciplining tools. And it should consider the nature of finance, which adapts not only to real and financial developments, but also to regulations.³

Obviously, addressing the question requires an objective. Most important are economic growth and financial stability, but one could also include access to financing for special groups (e.g. SMEs, housing), or broader (welfare) goals, including on inequality. The growth and stability objectives can overlap, but also conflict. And there surely is no clearly defined optimal, which in any case would vary by country (and preferably its society opines on it). Acknowledging that firm objectives are fraught with room for errors, analyzing longer-term patterns is challenging, many relationships are tenuous, and besides regulations, supervisory and regulatory approaches, legal and other formal rules, as well as taxation matter, the premise of the paper nevertheless is that by altering regulations, one can improve on growth and financial stability outcomes.

Research has analyzed the role of regulation in part through the lens of financial structure, that is, the mix of forms and types of services being provided (e.g. banks vs. markets, the size of shadow banking).⁴ Financial structure was for some time considered to be of little relevance, also as countries at similar levels of development have very different structures. Advances in technology, the greater availability and use of hard information, and more internationalized financial systems, however, have enhanced the scope for and increased the benefits of market-based intermediation and its complementarities with banking. And indeed market-based intermediation has grown faster than bank-based, notably in advanced countries. Also, as (per capita) income increases, countries' financial structures tend to move towards non-bank financing. Importantly, new literature and analyses consistently show that, as countries develop, the marginal contribution of banks to economic growth declines, while that of capital markets increases, notably as equity markets are better at promoting innovation and productivity, and financing new sources of growth.

While more market-based financing can be beneficial, especially for those (advanced) countries currently facing low growth, at the same time, as also shown by the global financial crisis (GFC), it can introduce new risks. More use of technology and a greater range of actors can increase the tendency for short-term, more transaction-oriented financing and collateralized trading, and reduce the

³ Although the global financial crisis (GFC) and its aftermath have led to many changes, including large-scale government interventions and many new regulations, these, while obviously important, are not much analyzed here (see Duffie's paper in this volume for an assessment), although they are neither necessarily taken for granted. Obviously, one can call more regulations and increased supervision a structural trend, but that would make the topic to some degree moot. Furthermore, although societies' risk-return preferences have shifted since the GFC, regulatory and political economy cycles can reverse (Aizenman (2009); Dagher (2016)). Having said this, I assume the new regulations and stronger enforcement to largely prevail, notably the greater emphasis on system-wide oversight, macroprudential policies, and reducing too big to fail problems and the adverse effects of interconnections. The paper also assumes a sensible approach to crisis management and restructuring, including reducing non-performing loans, restructuring weak banks, and a rationalizing of banking systems burdened by (too many) banks with low cost efficiencies.

⁴ Other structure aspects include the source and destination of financing (e.g. housing vs. corporate sector), and industrial organization aspects (e.g. ownership structures, concentration, and interdependencies). The paper does not review most of these dimensions, including how they evolve, which factors – including regulations – may be driving differences, and the potential effects on growth and financial stability. Much has been written on these issues and only key relevant findings will be highlighted.

willingness of market participants to invest in relationship, monitoring and governance roles (as they expect to be less able to recover the associated (upfront) costs). While from the supply-side, complementarities between banks and markets have arguably increased, data suggest that their economic growth benefits have declined over time. As financial services industries change, market failures also alter, with concerns including, besides systemic (solvency) risks in banks, a greater scope for externalities in financial markets. And as systems become more diverse, nationally and internationally, having coherent regulation and supervision becomes more challenging.

How best to balance growth objectives and risk concerns depends importantly on both specific regulations and institutional structures for systemic oversight. The broad regulatory pattern over past decades has been to move away from structure and conduct rules, leaving few or no entry barriers and limitations on products. In its place has come self-regulation – based on fair value (“mark to market”) valuation and accounting, disclosure and related market-based discipline, accompanied by capital-based (prudential) regulation. Many elements of this paradigm, used to strengthen banking systems in recent years, are now being applied to other investor classes, including money-market funds (MMFs) and institutional investors, such as insurance corporations and pension funds. Complementary measures are being put in place to ensure that market-based financing does not benefit from (implicit) backstops from the regular banking system.

While current approaches try to address risks in banking systems and reduce the scope for regulatory arbitrage, the paper argues that they can ignore other market failures which can also lead to systemic risks. Notably, a homogenization of business models makes for less overall diversity, creates more scope for perverse strategic complementarities, and reduces incentives for productive innovation. As such, a revised approach to non-bank forms of intermediation is needed. It will be important to implement macroprudential policies specific to the market failures and systemic risks that can arise in market-based financing. Complementary analyses need to take a broad view of regulations and supervisory actions, including both financial and economic outcomes, and examine the interactions between and across institutions, markets, participants, and jurisdictions, and across types of risks. A related need is to consider more explicitly the productivity of what is being financed and how, and the demand for specific financial assets. For many countries, this means to limit and better structure real estate financing, given its pernicious effects on financial stability (and limited impact on economic growth), and to more explicitly respond to the large demand for safe assets – related to demographical shifts, the declining price of investment, and savings gluts. Most importantly, since systems evolve and adapt, and as rules are hard to design preemptively, the paper argues that the key priority is for greater system-wide surveillance, in particular of securities and other non-bank markets. This implies in turn that many countries need to reform their regulatory governance to clarify responsibilities, and to allow for and incentivize appropriate interventions as systemic risks emerge.

The topic is of interest to most countries as they continue to adopt new regulations and, to some degree, (re-)calibrate existing ones. While the paper does not review

current regulatory approaches and progress in detail, it notes that these have largely focused on banking system stability. Less thought has been given to what regulation is best for achieving economic growth and overall financial stability. The topic is arguably of special interest to the EU, and notably the euro area, given its low economic growth, and still weak banking system, indicative of being overbanked, yet often closely linked to markets, and incipient changes in its forms of financial intermediation. With many elements of the banking union now in motion, and discussions on the capital markets union having started, it may be a good time to take stock there.

In approach, the paper is constructed as a literature review with new empirical analyses. In terms of outline, it proceeds as follows. Section 2 frames the issues by reviewing the analytics behind different types of systems, including what demand (i.e. the structure of the economy) and supply (i.e. the state of technology) factors may lead to certain financial structures. It also provides some key facts on financial structures in four key advanced economies: the eurozone, Japan, the United Kingdom, and the United States. Section 3 reviews analytical work and empirical findings, and provides new analyses on how financial structures evolve with the real economy and on key relationships between financial structures, and economic growth and financial stability. Section 4 provides a review and analyses on how laws, regulations and other (supervisory) actions influence financial structures. This section highlights how externalities and path dependencies can mean that market forces do not necessarily deliver a financial system “optimal” given demand for and supply of financial services. It then asks which regulations and how regulatory governance would need to adapt to structural changes and for what purpose, thus providing policy lessons.⁵ Section 5 concludes.

2 Framing and financial structures in key advanced economies

This section reviews the most commonly used distinctions and actual financial structures in the eurozone, Japan, the United Kingdom, and the United States (G4).

2.1 Dimensions of financial structures

Financial systems can be characterized in many ways and much has been written on which factors may drive differences in their structure (key references are Allen and Gale (2000) and Demirgüç-Kunt and Levine (2001)). As should be obvious, this literature is based on the notion that, because markets are not perfect, financial

⁵ The paper stays away from large system changes, as advocated by some (e.g. King (2016), Turner (2015), and Wolf (2014)) and involving proposals such as narrow banks, greater use of collaterals, and large asset/liability swaps between the central bank and fiscal authority. While these could, and perhaps should, be part of future financial systems, I have less ambition and expectations that they can and will be adopted. The paper neither considers how current macroeconomic conditions, monetary policy and other central bank actions, and related factors, including possible secular stagnation, affect financial systems and possibly regulations.

structures can matter. Theories can be grouped under banks vs. markets, types of services provided, interactions among services, and the role of international factors.

Banks vs. markets. Allen and Gale (1997) distinguished how financial systems deal with shocks. In a stylized world, securities markets engage in intratemporal smoothing, where asset prices adjust as shocks materialize and the impact of the shock is distributed widely, whereas banks engage in intertemporal smoothing, by absorbing shocks on their balance sheets (if not overleveraged or impaired) and if necessary providing liquidity services. This classification overlaps to some degree with the distinction relationship vs. arms-length intermediation, and why securities markets, and equity markets in particular, are good at aggregating information into one asset price (Allen (1993)). Another difference is between universal banking and specialized banking, e.g. commercial and investment banking separated. While these three differences need not exactly overlap, much of the literature considers bank-orientation, relationship-based and universal banking on the one hand, and market-orientation, arms-length lending and specialized banking on the other. Similarly, the relative importance of bank intermediated funds, i.e. credit to the non-financial sector, vs. capital markets, i.e. its capitalization, with the latter typically covering equity and sometimes also bond markets, are used to classify financial systems.⁶

Type of financial services. Another way of classifying systems is by the mix of financial functions and services being provided (e.g. Merton and Bodie (1995); Levine (2005)). Systems can, say, largely be involved in payments or transferring resources over time. This classification comes closer to considering the type and degree of financial frictions, individual and collective, that specific services try to overcome or reduce. Many such frictions exist: information asymmetry, principal agent, adverse selection, hold-up, enforcement or other problems intermediaries and markets face in providing financial services. This approach often frames financial services provision as a corporate finance or contracting problem, suggesting, given also the types of (idiosyncratic) shocks, what specific security, e.g. debt or equity, is best suited to overcome a specific friction (e.g. Stulz (2000); Tirole (2006)). In principle, this “optimal security design” view calls for classifying countries by the type and severity of frictions prevalent as financial structures are to some degree their manifestations (see Dabla-Norris et al. (2015) for related modeling).

Interactions among financial services. In practice, classifications based on institutional form, service or friction are challenging. A specific form can provide multiple services and, conversely, different forms can provide the same service or overcome the same friction. The economics of supplying services, where there can be both competition and complementarity between various forms at the product, institution and system level (Adrian and Shin (2010); Boot and Thakor (2014), review) then also become important. For example, bank loans and bond financing can compete, as when they both provide external financing, but also complement, as when firms optimally use a mix of instruments to overcome contracting and

⁶ Further, more refined classifications can be made of course, such as regarding the importance of specific types of non-bank financial institutions, e.g. leasing and factoring companies, or the importance of pension, insurance, and other institutional investors. And more recently emphasis has been on shadow banking, a subset of non-banks.

governance frictions. At the institution level, given economies of scope, some bundles of services may be provided cheaper compared to individual provision. At the system level, complementarities can be on the liability side, as when the development of capital markets directly matters for banks by reducing the cost of equity and debt for banks, especially relevant today as repo markets are important for funding. On the asset side, a complementarity is securitization where banks are involved in underwriting and help overcome information asymmetries, but then need capital markets. And there are many indirect channels, as when asset prices affect collateral values and facilitate bank financing (e.g. house prices and mortgages).

While not new, these interactions and complementarities have been increasing.⁷ Greater use of information technology increases the economies of scope at the institution level – as data can be used more easily for multiple products. It allows for greater separation in and increases the use of (value-added) chains, makes claims more tradeable, reduces information asymmetries, and lowers switching costs for wholesale (and retail) customers. This is reflected in the growing use by banks of secured and shorter-term type funding, and larger involvement in capital markets. Technological advances also encourage banks to use franchise value from ongoing (relationship-based) activities to engage in capital market activities and scale up their returns, albeit with greater risk profiles (Boot and Ratnovski (2016)). Many banks, large ones especially, are no longer the text-book ones that take household deposits and on-lend these to corporations, but rather manage risks in various markets, domestic and international, trading claims and arbitraging across markets, all using their competitive advantage. As Shin (2009a, p. 110) puts it, “... in a modern market-based financial system, banking and capital market conditions should not be viewed in isolation.”

Advances also allow for more specialization, making vertical and other forms of integration less desirable, thereby affecting markets and structures.⁸ More recently, fintech, defined here as financial service provision by non-financial corporations, is starting to affect services such as small scale payments and lending (World Economic Forum (2015)). While promising higher productivity, lower costs, and better access to services, as new providers engage in “cream skimming”, it also alters the interactions between banks and other markets (see Banque de France (2016) for a collection of articles, and World Economic Forum (2016) for industry views on the implications of fintech). All these shifts blur the distinction between

⁷ See De la Torre, Feyen and Ize (2013) for a review and related analyses. Modeling (e.g. Song and Thakor (2013)) shows that there can not only be co-evolution between bank and market financing, but also competition and complementarity at the system level, which can change over time, notably due to political interventions that are more skewed towards the banking system.

⁸ Changes in technology and related productivity shifts can alter competitive structures when they make for fewer institutions with the scale to defer the high (fixed) investments, but then needing to operate in both banking and capital markets. Effects can manifest themselves in very general, e.g. overall market concentration, and specific ways, e.g. new trading systems owned by a few players.

types of provider, function, and friction.⁹ More generally, as the financial sector is very much in flux (Boot (2014)), many classifications, like the dichotomy banks vs. markets, are increasingly less relevant.

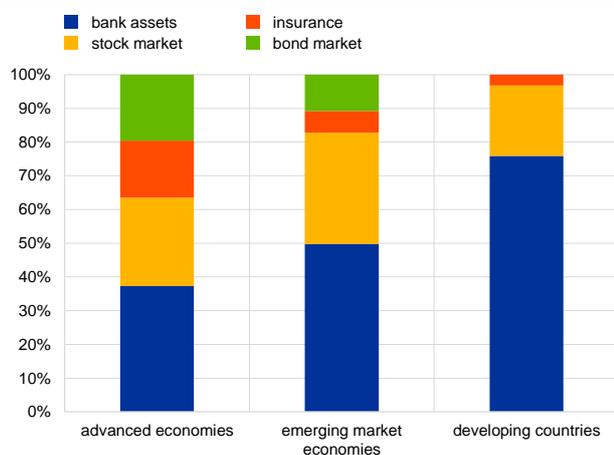
Internationalization. The international context can alter how one views financial structures, say if a country disproportionately exports or imports certain services. Before the GFC, and still today, many European countries export(ed) banking services on a large scale. Key financial centers like the United Kingdom provide many capital market services for other countries, and France, Ireland and Luxembourg have large regional roles in mutual fund services. While these centers make Europe overall somewhat less bank-based, there are still home biases, as in the assets held by households (deposits locally). Even in capital markets, the euro area is not perfectly integrated, as the capital markets union (CMU) discussion shows.¹⁰ Internationalization can nevertheless drive changes. On the demand side, real and financial integration means greater scope for cross-border financial services. On the supply side, banks, most often from advanced countries, have expanded abroad, through both cross-border banking and foreign bank presence, although the latter largely in emerging markets. More recently, emerging markets' banks have become active abroad (Claessens and van Horen (2015)). Regulation and supervision, however, did not keep up with cross-border banking, notably in resolution (Claessens, Herring and Schoenmaker (2010)).

⁹ Another aspect is the need for coordination in an economy. When less developed, large banks may play a coordinating role in industrialization, as often claimed for Germany. And overcoming collective market failures obviously matters for securities markets. Also important can be the balance between large and small banks, as small banks may finance small firms with greater labor intensity, while “too many” transaction banks can be harmful due to cream-skimming. The ownership of financial institutions, e.g. foreign vs. domestic banks, state-owned vs. private, obviously matters, including regarding the role of the state in resource allocation. Another dimension is concentration, including size of banks, and related too big to fail and systemic risk. The (global) industrial organization of investment banking may matter for capital markets (Goodhart and Schoenmaker (2016)). I defer all these issues.

¹⁰ Even within the United States, regional differences matter (e.g. Coval and Moskowitz (1999)). As such, local structures do still matter.

2.2 What are current financial structures in the G4?

Chart 1
Economic development and financial structure



Sources: Global Financial Development Database (GFDD); Čihák, Demirgüç-Kunt, Feyen, and Levine (2012).
Notes: Shares of financial assets, averaged over countries. Countries are grouped using World Bank definitions.

As economies develop, both banks and capital markets increase in importance. Banks though are more important at lower and capital markets at higher levels of development (Boyd and Smith (1998); Demirgüç-Kunt and Levine (2001)). These patterns extend to other forms of finance, e.g. insurance and other non-bank segments. Chart 1 shows these patterns by income level in a simple cross-country perspective. A comparison of the eurozone, Japan, the United Kingdom, and the United States, “G4”, however, shows considerable differences, even though these economies today are similarly developed (Chart 2a). (See also Allen, Chui, and Maddaloni (2004). For information on various (other) structural aspects in the euro area specifically, see ECB (2015)). The biggest difference is the much greater importance of banks in Japan, the United Kingdom and euro area relative to GDP, with banking systems in the United Kingdom, a financial

center, and the euro area exceeding that of the United States by almost a factor 3, in part as European banks are internationally more active. And US bond markets are much more developed than the other economies. While international financial integration matters – overall, EU and eurozone structures are more market-based than the average individual country due to the large capital markets in key centers, serving in part the region as a whole (Chart 2b) – European structures still deviate much from the general tendency towards more market-based financing as income rises.

Chart 2a

Financial structures in the G4 (euro area, Japan, United Kingdom, and United States)

(financial assets/GDP, %)

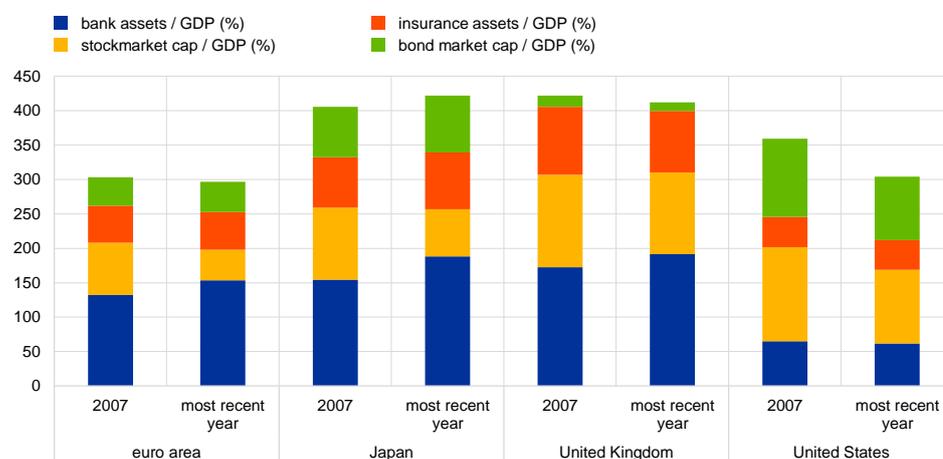
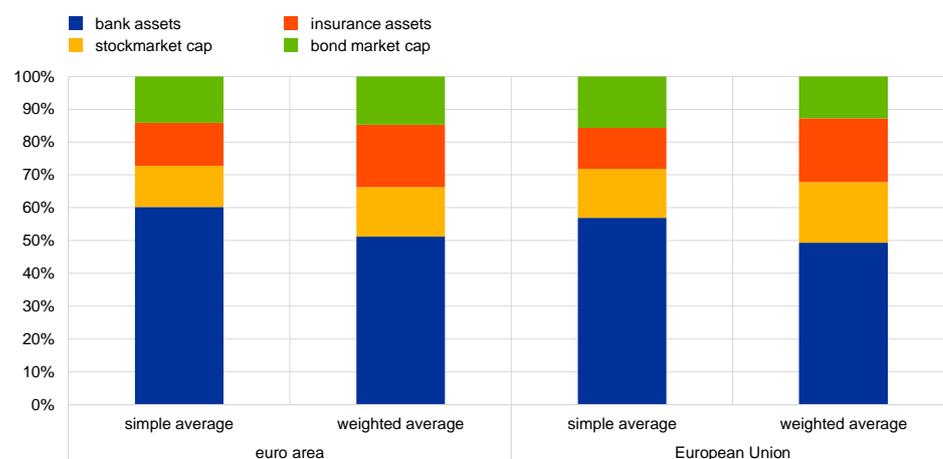


Chart 2b

Financial structures in Europe: country averages vs. weighted averages

(percent of total financial development)



Source: Global Financial Development Database (GFDD); Čihák, Demirgüç-Kunt, Feyen, and Levine (2012).
 Note: Weighted averages depict the ratios for whole group.

Reflecting the factors highlighted, financial structures have changed over the last few decades. The share of market-based financing, including shadow banking, had been increasing before the crisis in all the G4 countries (Charts 3a-b). Another major shift has been in what is being financed. While trade and government finance was the mainstay lending activity of commercial banks for centuries, starting in the early 20th century banks became more important for financing of corporate investment. And after the mid-20th century, the financing of households, mortgages, and consumer credit sharply increased.¹¹ Today, small differences exist among the G4 in destinations (Charts 3c-d). Still, the corporate sector gets more credit in the euro

¹¹ Jorda, Schularick, and Taylor (2016) show that for 17 currently advanced countries household financing was only some 30% of bank lending in 1900, but grew to some 60% in 2012. See also Cerutti, Dagher, and Dell'Ariccia (2015) for country comparisons.

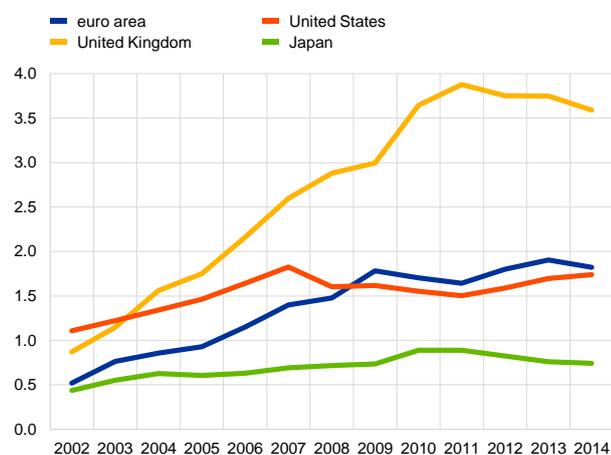
area and Japan, and the household sector more in the United Kingdom and United States, even though less so since the GFC. Another trend is that the generation and management of savings has moved from households to corporations and institutional investors, among others due to lower capital intensities (Doettling and Perotti (2016)), and better technology for managing (surplus) funds. As savings patterns have changed, combined with greater intra-financial system demand for collateralized financing, the demand for safe assets has changed, leading to supply responses, including the rise of shadow banking (Claessens et al. (2012); Pozsar, (2011, 2015)).

Chart 3

Shadow banking, and corporate and household credit

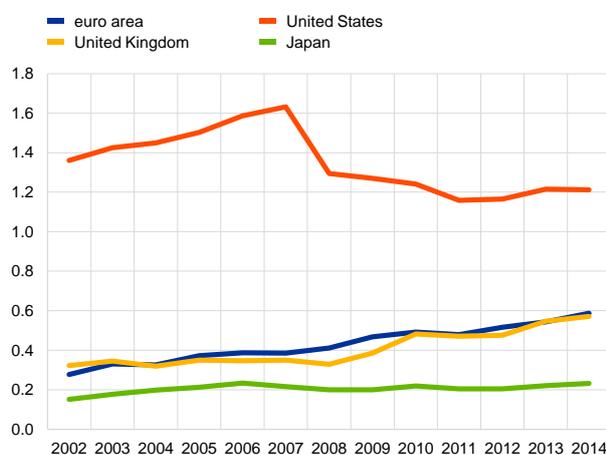
a) Shadow banking

(percent of GDP)



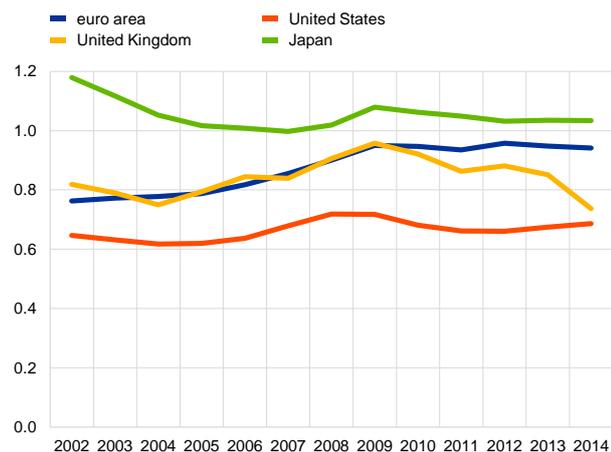
b) Shadow banking

(percent of banking assets)



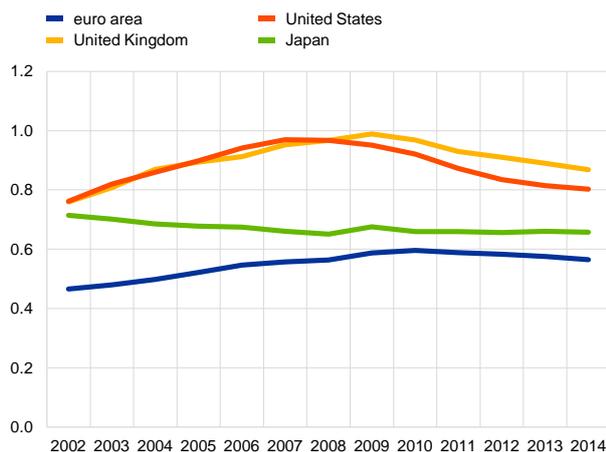
c) Corporate credit

(percent of GDP)



d) Household credit

(percent of GDP)



Sources: FSB (2015a); IMF (2014); and BIS "Credit to the non-financial sector" series.

The GFC interrupted these trends in some ways, but also spurred them on in other ways. It led to a sharp reduction in securitization, notably in the United States, and savings shifted toward banks and, in the United States, away from MMFs. Banks, under market and regulatory pressures, shrunk lending activities and increased investments in safe assets, in part driven by new regulations (and sometimes

perverse sovereign-bank links). A while before the GFC, the demand for safe, short-term assets was in large part met by privately-provided assets (although often backed up by public collateral, as in the form of repos); afterwards, as shadow banking collapsed, the public sector took on more directly the role of providing the security investors demanded. At the same time, low interest rates in many economies have led to more (corporate) market-based financing amid a (global) search for yield. While some patterns are thus cyclical, and can reverse as banks rebuild balance sheets, central banks unwind theirs, and interest rates increase, many are more structural. What the effects of these differences are and what factors explain them are the focus of the next two sections.

3 How do financial structures matter for economic and financial outcomes?

This section reviews existing and new evidence on how financial structures relate to economic development and financial stability.

Financial structures and economic development. Earlier studies concluded that, conditional on the quality of a country's legal, regulatory and general institutional systems, structures did not matter for growth. This was supported by aggregate, sector and microeconomic evidence, the latter including firm-level data (Demirgüç-Kunt and Levine (2001); Beck and Levine (2002, 2004); Demirgüç-Kunt and Maksimovic (2002)). The fact that many advanced countries had quite different structures, yet similar levels of development, buttressed the view that financial structure was not so important for economic development. New research has since provided a reassessment. Importantly, it has found that the marginal contribution of banks to economic growth declines as economies develop, while that of equity markets increases (Demirgüç-Kunt, Feyen, and Levine (2013)). Supportive of this, Langfield and Pagano (2016) report a negative association between growth and the ratio of bank to market-based intermediation. While this latter result may be due to the outsized development of some European banking systems and adverse effects of large-scale housing financing, the more limited impact of banking on growth as income rises appears to be more general.

Indeed, updating Demirgüç-Kunt, Feyen, and Levine (2013), Chart 4 shows how relationships between per capita economic growth and various forms of finance change, with diminishing effects of banking at higher levels of development and increasing effects of securities markets.¹² While there remain questions on

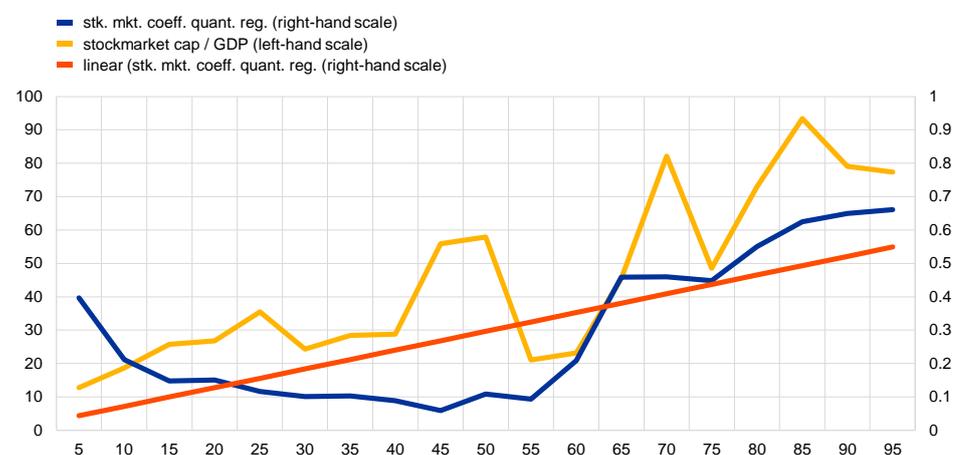
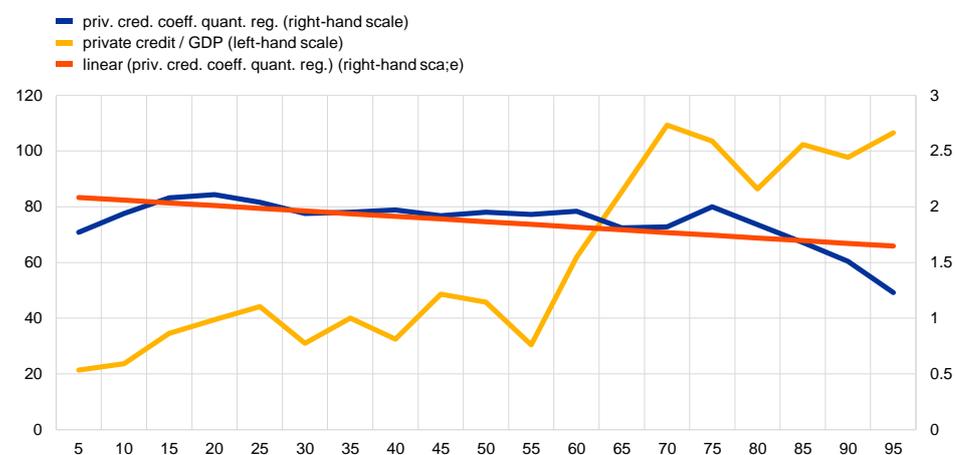
¹² Most of this literature controls for various other factors. Typically, most effects hold conditional on factors typically found to drive financial development, including the level of education, role of government, macroeconomic stability, and property rights protection. And there are various feedback mechanisms, implying that studies that do not address endogeneity can overstate the effect of finance on growth. Trying to overcome endogeneity using various techniques and experiments, however, results are generally confirmed. Furthermore, the beneficial effects of finance can vary with other conditions. For example, the quality of property rights matters not just because it increases the volume of external financing but also as it affects the quality of allocation, with both important for growth (Claessens and Laeven (2003)). Similarly, the quality of regulation, supervision and judicial enforcement matter for the impact of finance (Barth, Caprio, and Levine (2006); Levine (2012) summarizes this literature).

identification and causation, other studies largely confirm these results (e.g. Gambacorta, Yang, and Tsatsaronis (2014), and Cournède and Denk (2015); see also European Commission (2015), OECD (2015) and UNEP Inquiry (2015) for reviews of various aspects of financial structures and growth impacts). Other, earlier evidence also suggests that, while bank-based systems fare better for countries with underdeveloped financial systems, market-based systems outperform bank-based systems for more developed countries (Tadesse (2002)).¹³

Chart 4
Financial development and economic growth

Bank credit/GDP

(percentages; x-axis: quantiles of log GDP per capita; y-axis: regression coefficient)



Notes: The yellow lines (right-hand scale) display the levels of financial development for the respective income level. The quantile regressions use a sample of 73 countries over 23 years, with growth rates averaged over five-year periods – to smooth out business cycle effects. The coefficients (blue lines, left-hand scale) are allowed to vary by level of GDP per capita, with the red lines depicting the trends in the coefficients.

Related, recent papers have found that capital markets induce greater productivity gains, innovation, and technological change. Evidence, e.g. Hsu et al. (2014),

¹³ Demirgüç-Kunt, Feyen, and Levine (2011) furthermore show that countries further from what is called an optimal financial structure (benchmarked on OECD countries) grow less. There are methodological questions, however.

suggests a positive relation between equity forms of finance and improvements in industry efficiency, productivity, and real output. Evidence also suggests that equity markets contribute more to innovation than banks do, whereas bank financing appears to discourage innovation.¹⁴ This underscores the role of capital markets, and equity markets especially, as a source of valuable governance and economic growth. This new evidence thus suggests that as economies develop, those services other than banking become more important for economic activity (consistent with their general greater importance in more developed countries).¹⁵

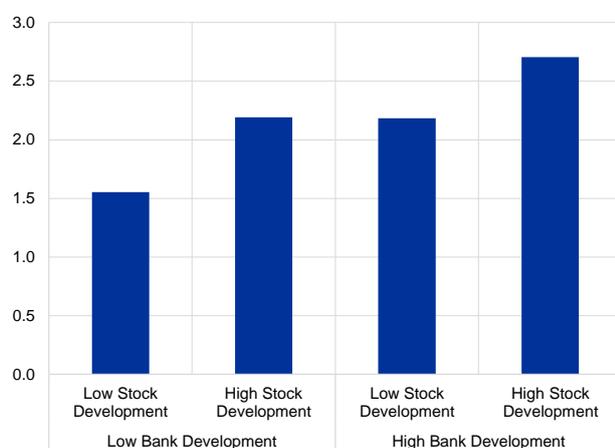
There is also evidence of complementarities between banks and markets, with shifts over time though. At least until 2000, growth was, besides being higher in countries with high rather than low banking development, even higher in both when equity markets were more developed too. And conversely, growth was, besides being higher in countries with high rather than low equity market development, even higher in both when banking systems were more developed too (see Chart 5). While complementarities from the supply side may have increased – clearly banks engage more these days in capital market transactions – they seem to have declined in terms of impact on economic growth, however, as during 2000-07 economic growth was similar, regardless of relative developments.

Chart 5

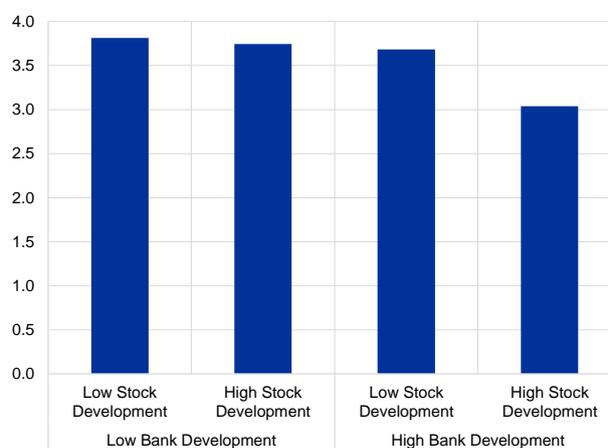
Economic growth complementarities of banking and equity market development

Average GDP per capita growth by level of bank vs. stock market development

(before 1999)



(after 1999)



Sources: Global Financial Development Database (GFDD); Čihák, Demirgüç-Kunt, Feyen, and Levine (2012).

Notes: The charts depict the average growth rates for four groups of countries sorted below or above the median levels of bank and equity market development.

¹⁴ This evidence is based on repeating the regressions of Laeven, Levine, and Michalopoulos (2015) using (updated) stock market developments (market capitalization to GDP) instead of private credit to GDP.

¹⁵ Of course, while some innovations are good, e.g. as they help screening, others can have perverse effects, e.g. as for some forms of securitization (for a model see Shin (2009b)). Separating good from bad innovations has been much discussed (e.g. Rajan (2005); the Levine-Stiglitz 2010 debate; Pagano (2013)). See also Zingales (2015) on whether financial innovation benefits society and the (cyclical) views on the benefits of finance, including among researchers, and Philippon (2016) on finance's economic costs.

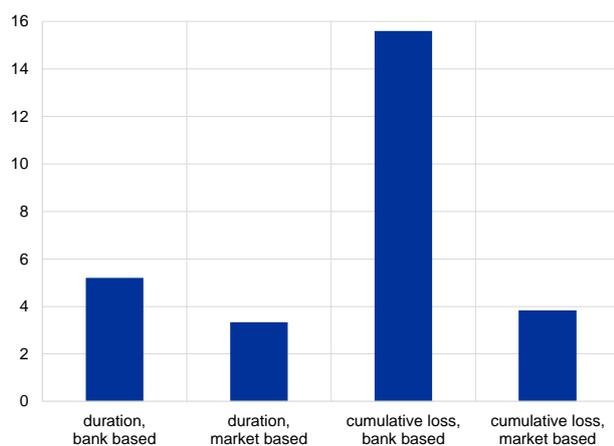
Financial structures and financial stability. More market-based systems are more diversified and generally have fewer crises and less deep recessions, while (large) banking systems are more likely to experience a crisis and also recover more slowly from one (Langfield and Pagano (2016)). Gambacorta, Yang, and Tsatsaronis (2014) find that in recessions coinciding with a crisis the adverse GDP impact is three times as severe for bank-oriented than for market-oriented economies (see also Allard and Blavy (2011)). For a large sample of business and financial cycles, using the approach of Claessens et al. (2012) with updated data, the cumulative loss of recessions associated with credit crunches is much larger in bank-based than in market-based systems (see Chart 6). The converse is not true, however, in that equity busts are not worse in market-based systems. The “spare tire” theory, where recovery from a crisis is faster with a more diversified system, has also been confirmed.¹⁶ While some of these findings may reflect financial as much as political economy effects, related to the willingness and speed of restructuring, the general pattern tends to stand.

Chart 6

Financial downturns and recessions: bank vs. market-based systems

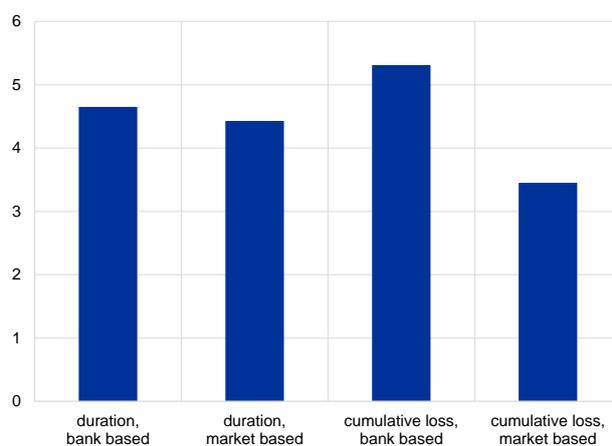
Recessions with severe credit crunches

(quarters; percent of GDP)



Recessions with severe equity busts

(quarters; percent of GDP)



Source: Based on Claessens et al. (2016), forthcoming.

Notes: Duration for recessions (left-hand scale) is the number of quarters between peak and trough. Cumulative loss (right-hand scale) combines information about the duration and amplitude to measure the overall cost of a recession and is expressed in percent of GDP. Sample: 24 advanced countries. A country is classified as market based if its equity market capitalization to GDP ratio is greater than the sample average. Market-based: Australia, Canada, Finland, Iceland, Japan, Luxembourg, Netherlands, Spain, Sweden, Switzerland, United Kingdom, and the United States. Bank-based: Austria, Belgium, Cyprus, Denmark, France, Germany, Greece, Ireland, Italy, New Zealand, Norway, and Portugal.

While crises have been much studied (e.g. Claessens et al. (2014)), and the adverse effects of credit booms associated with house price increases are now well accepted (e.g. Jorda, Schularick, and Taylor (2016); Cerutti, Dagher, and Dell’Ariccia (2015)), few studies relate financial stability to the relative importance of specific financial functions.¹⁷ While microprudentially, limits to maturity transformation are well appreciated, how systemic maturity transformation can drive financial instability was

¹⁶ Levine et al. (2016) however shows that in terms of firms’ access to financing, the effect depends importantly on the type of legal system, i.e. how well protected shareholders’ rights are, and less on a country’s financial structure, i.e. how well developed stock markets are before a crisis.

¹⁷ Financial systems’ industrial organization – as in the degree of contestability, (banking system) concentration and ownership structures – has also been found to matter for financial stability. Again, I do not review these structural aspects.

little acknowledged until the GFC (except perhaps for foreign exchange-related mismatches). Hahm, Shim, and Shin (2013) show, however, that the degree of wholesale funding can predict financial crises. More generally, many have argued that the GFC was in large part due to the “run” on short-term, wholesale funding structures, including repos and other securities market-financings. Indeed, related to the instability of privately-produced safe assets (Gorton (2016)), Shin (2013) argues that liability-based measures can be good, timely predictors of crises.

Financial structures and pro-cyclicality. While more market-based systems can provide many benefits – in terms of reducing the likelihood of a crisis and recovering faster and stronger from a crisis – such systems may lead to more short-term volatility, consistent with the fact that they rely more on intratemporal forms of smoothing. This is not limited to higher asset price volatility, but extends itself to greater sensitivity and pro-cyclicality of banks’ balance sheets, and related overall leverage, financing, and funding conditions in these systems. Indeed, analyses (Adrian and Shin (2008, 2014)) show that US investment banks increase their leverage at times when asset prices are high, and thus create pro-cyclicality in financial conditions, whereas the behavior of leverage of US non-financial corporations and households is counter-cyclical and of commercial banks a-cyclical. Consistent with this, market-based financial systems are found to be associated with greater short-run volatility in bank leverage than bank-based systems (IMF (2006); see also Kalemli-Ozcan, Sørensen, and Yesiltas (2012) for a cross-country analysis of leverage and asset growth).

Building on this work, Chart 7 shows differences in how close changes in financial leverage are associated with changes in assets for those global systemically important banks (G-SIBs) located in market vs. in bank-based financial systems. Specifically, regression results (Table 1) show that the slope is 0.176 higher for G-SIBs headquartered in market-based systems than in bank-systems, confirming the greater balance sheet sensitivity of such banks to changes in capitalization. Combined with their generally larger off-balance-sheet activities, this may also make it more difficult to assess such banks.¹⁸ More generally, as market-based intermediation increases, so will likely asset price volatility. And greater use of technology, including by fintech, can also come, besides with its own risks (Lo (2016)), with greater price volatility as pricing get more marginalized.¹⁹

¹⁸ Supportive evidence comes from the fact that financial conglomerates that engage in multiple activities trade at a discount relative to if they were broken up in similar, but stand-alone intermediaries (Laeven and Levine (2007)).

¹⁹ There is an analogue to ongoing changes in power generation and distribution, where the no-peak marginal provider may be solar-generated. While providers, and users, get benefits, existing utilities still need to have spare capacity to provide at peak, yet by regulation may need to buy the extra generated electricity at the average price. (Another comparison is moving from public to private delivery of postal or transport services, with issues of services for remote areas at a common price.) Such changes can mean more volatility in prices, as they are set by the marginal provider and user (“Uber” pricing model), yet leave a “quantity” problem. Similarly, if services are being provided by fintech, the question arises of who will pay for the infrastructure at peak or turmoil times. Fintech can also reduce the franchise values of existing institutions, thereby raising challenges for fixed-costs recovery and creating “stranded assets”.

Chart 7

G-SIBs' leverage growth vs. assets growth

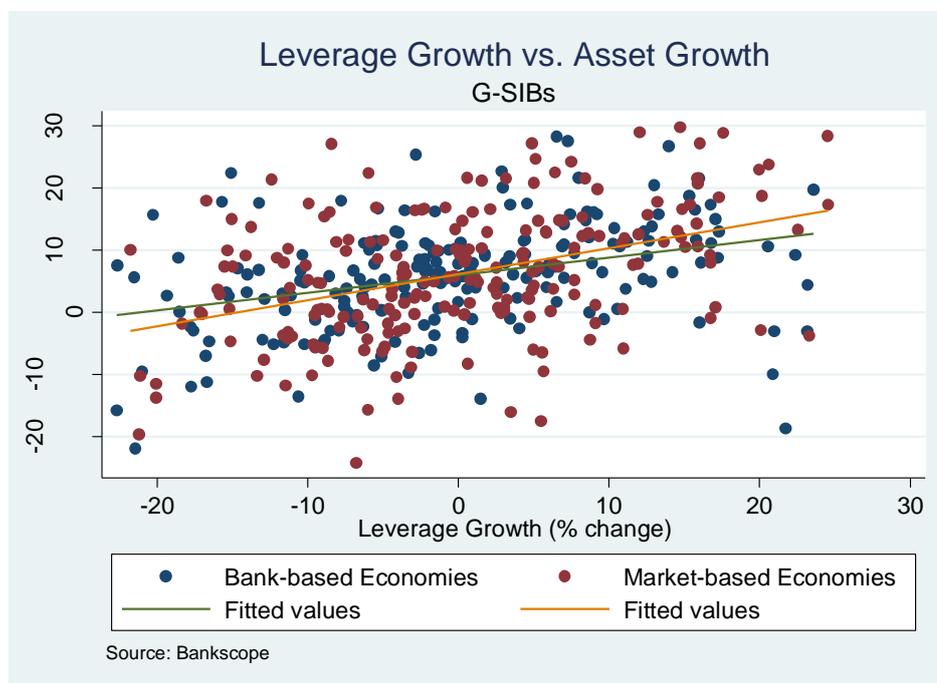


Table 1

Regression of G-SIBs' asset and leverage growth: bank-based vs. market-based

	(1)	(2)	(3)	(4)	(5)	(6)
			Local Currency Asset Growth (%)			
Leverage Growth (%)	0.342*** (6.04)	0.295*** (5.59)	0.273*** (4.91)	0.275*** (3.55)	0.241*** (3.37)	0.182** (2.32)
Market-based Economy				0.272 (0.25)	0.0767 (0.07)	-3.892*** (-4.87)
Market X Leverage Growth				0.139 (1.25)	0.110 (1.13)	0.176* (1.76)
Fixed Effects:						
Year		✓	✓		✓	✓
Bank			✓			✓
Observations	405	405	405	405	405	405

Note: Robust standard errors clustered at the bank level. T-statistics in parentheses.

* p<0.10, ** p<0.05, *** p<0.01.

Source: Bankscope.

Notes: Countries are classified as bank-based (China, France, Germany, Italy, Japan, Netherlands, and Spain) or market-based (Sweden, Switzerland, United Kingdom, and the United States).

4 What is the role of regulation in financial structures?

This section reviews the literature on factors and regulations affecting financial structures, discusses regulatory trends and current reforms, and concludes with regulatory changes that can steer financial structures and improve on economic and financial stability outcomes.²⁰

4.1 General drivers

Many of the drivers of financial development have been identified (see Beck and Levine (2005), and Philippon and Reshef (2013), for reviews).²¹ While less analyzed, drivers of financial structures are in general similar, but with different weights (De La Torre, Feyen, and Ize (2013)). Endowments can matter as countries with comparative advantage in capital-intensive sectors rely more on bank financing, as it depends more on the security of tangible investment, while countries relying more on intangibles for growth use more market-based financing. Macroeconomic stability matters more for banking than for equity markets, not surprising given the adverse effects of inflation for nominal contracts. Although less emphasized, forms of taxation can drive choices among services, in supply and demand, with debt financing typically favored.

Respective property rights – creditor or minority rights – and their enforcement matter for the development of both, as shown in Charts 8a and 8b. Related, capital markets depend on the quality of corporate governance and other gatekeepers, such as accounting and rating agencies. Most of this is well recognized, albeit with various caveats.²² Less noticed is that equity market and capital market development more generally is more sensitive to the quality of its property rights than the credit market

²⁰ Although recent research has recognized financial structures to be important, it is often overlooked for a number of related reasons: one, regulation often responds to crises and aims to prevent their recurrence, but is not necessarily designed from first principles; two, the effects of structure play out over the long term, beyond the typical horizons of policymakers and legislators; three, structures are affected by and to a significant degree endogenous to many aspects other than regulation, notably to what is happening in the real economy and how services can be provided, e.g. the state of technology; and four, too little is known on how structures matter and what changes them so as to guide policy precisely. While this makes for some trepidation, I argue more is known than what appears to be reflected in day-to-day, regulatory decision-making. And even if not perfectly clear whether and how one can adapt systems “optimally” to structural changes by regulatory and other actions, some principles apply.

²¹ General economic development, endowments and macroeconomic stability have been found to affect financial development. The law and finance literature highlights the important roles of basic property rights and specific laws – collateral, bankruptcy, and minority rights, all backed up by proper judicial enforcement. Much of this reflects the difference between common and civil laws, which also affects economic development (Beck (2012) reviews). A common law system, besides having stronger property rights, adapts more easily, related to broader issues of political economy and democracy, but also importantly shows fewer path dependencies.

²² As for many aspects of finance, the causal links are not always obvious as there are many feedback loops. For example, bankruptcy rules are considered by some legal scholars to be endogenous to the importance of banks. More generally, there are many endogenous, path-dependent, and non-linear relationships (see further Beck (2012)).

is to its (Charts 8a vs. 8b).²³ As such, the limited capital market development in many countries, including private equity, venture capital, and angel financing, is explained by the poor presence and enforcement of specific property rights. And, given greater economies of scale, the lack of harmonization of rules will set smaller markets back.

Chart 8a

Banking development and creditor rights

Creditor rights index

(private credit/GDP; percentages)

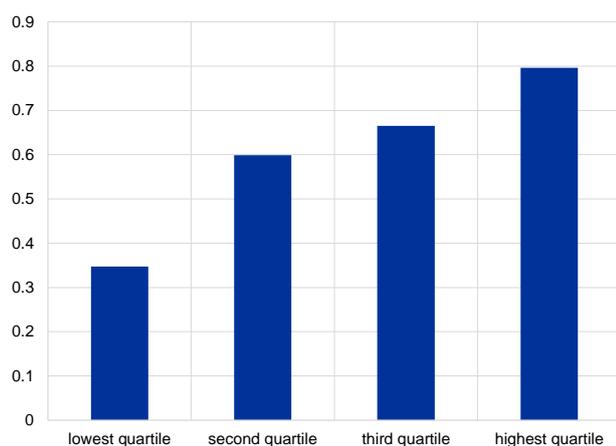
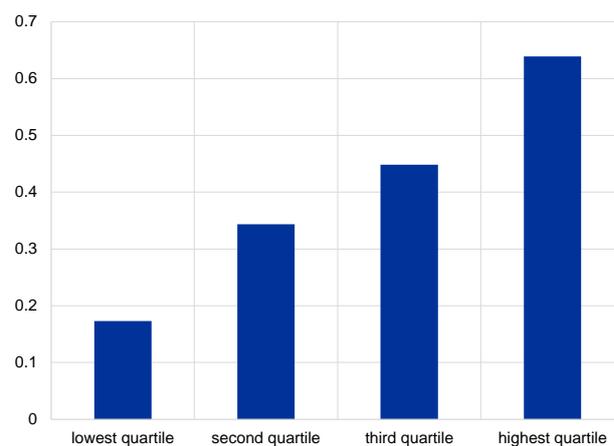


Chart 8b

Equity market development and minority rights

Equity rights index

(stockmarket cap/GDP; percentages)



Source: Claessens (2006), updated with data from WDI-GDF (2011) and Djankov et al. (2008b).

Notes: The charts depict countries sorted into four quartiles depending on the strength of their property rights (creditor rights or shareholder rights), adjusted for the extent to which the rule of law is enforced in the country. The creditor rights index, first developed by La Porta et al. (1998), is the summation of four dummy variables, with 4 the highest possible score. The equity rights index is the summation of five dummy variables, with 5 the highest possible score. The rule of law is a measure of the judicial efficiency and integrity of the legal environment, as first reported by La Porta et al. (1998).

While the influence of endowments and (enforcement of) property rights is most profound, regulations do affect financial structures.²⁴ Indeed, using the Abiad and Mody (2005) measures, Langfield and Pagano (2016) find evidence that segment-specific liberalizations affect the development of banking vs. equity markets. A very important factor is the safety net provided to banks and related moral hazard. Clearly, until recently at least, banks in many countries were at little risk of being closed or liquidated when they ran into solvency issues, whereas at least the smaller banks in the United States, a market-based country, did face this threat. While the safety net explanation is not specific, an additional reason important in Europe before the crisis was the push for national champions in light of the Single Market

²³ Simple regressions show that equity markets are more sensitive with respect to protection of minority rights compared with credit markets to creditor rights, whereas credit markets are more sensitive compared with equity markets to the rule of law. This is consistent with claims traded in anonymous markets depending to a greater degree on the quality of relevant property rights and regulatory and judicial systems than claims issued by institutions such as banks, where the institutions themselves provide some credibility and enforcement. At the same time, credit markets require protection against expropriation by the state, which depends on the overall rule of law. These findings are consistent with De La Torre, Feyen, and Ize (2013) and Acemoglu and Johnson (2005). The latter finds that (vertical) property rights, protecting against interference by the state, have large effects on general financial development, but (horizontal) contracting ones, allowing agents to contract reliably, only matter for stock markets.

²⁴ Effects are in part less clear as regulations are more endogenous and more easily change or get circumvented. Also, depending on mandates and governance, regulators can help or hinder the development of alternative markets, e.g. bank regulatory agencies may not “allow” for some forms of market-based financing.

and the euro. Together with political economy factors (e.g. Calomiris and Haber (2014)) and perverse bank-sovereign links, these preferences biased financial structures in Europe and many other countries towards banks, including through (quicker) adoption of Basel II. Together these factors allowed for and encouraged a rapid bank asset expansion in Europe over the decades before the GFC, much more so than elsewhere (see further Pagano et al. (2015)). As a related point, this meant a “crowding out” of various non-bank markets and less financial system diversity.

International financial integration and the mix of domestic and foreign institutions matter in various ways. Clearly, securities markets are by nature more international, given economies of scale and related ease to trade across borders, than banking markets. Internationalization can encourage harmonization of rules and supervision, and, importantly, help reduce the influence of vested interests (Rajan and Zingales, (2003a)). The EU banking union, and especially European banking supervision, also show some of the benefits of centralization. Yet, internationalization does not always support reforms. As documented by ECB (2013) and Claessens and Van Horen (2015), prior to the GFC, advanced countries’ banks, including in the eurozone, interacted with each other largely through cross-border banking and much less through local foreign bank (brick and mortar) affiliates, making for less local impact and risk-sharing. By contrast, these same banks were active through foreign bank presence elsewhere. While increased globalization and financial conglomerates spanning multiple markets thus reduce the importance of local financial structures, and create common trends and reform pressures, there remain differences in structures and their impacts.

Lastly, it is important to keep in mind that drivers of financial structures can be idiosyncratic, with path dependencies to play a large role. This is clear from key (current) advanced countries, whose structures differ, as noted, in multiple ways, but not due to factors such as level of development, macroeconomic stability, or enforcement of overall property rights, which are and have been very comparable. Rather, the literature has highlighted certain specific regulations and laws (Fohlin (2016) provides some examples).²⁵

4.2 Broad regulatory trends

While one should be hesitant on how specific regulations may lead to changes, broad regulatory trends over the past decades have (implicitly) led to certain, though not necessarily “optimal” structures. In part in response to technological advances and increased diversity and aiming to achieve more market-oriented systems, there have been moves away from structure and conduct rules, with few or no entry barriers and limitations on financial products and services left (Table 2). This general removal is well known and documented (e.g. Abiad, Detragiache, and Mody (2010)).

²⁵ For example, a tax ruling exempted some shares deposited with banks in Germany from dividend taxes. This encouraged individuals to deposit shares with banks and helped, in turn, banks to exercise proxy votes in shareholder meetings of non-financial corporations, thereby supporting the universal banking model. Another example is the rise of the MMFs in the United States which was in part due to interest rate controls (regulation Q) in the 1970s, yet their existence is maintained. Other examples of path dependencies include the nature of pension funds (defined contribution vs. defined benefit) related in part to the tax treatment of various savings instruments.

In its place has come a greater emphasis on self-regulation, with more disclosure and related market-based discipline. An important complement, for both financial and non-financial corporations, has been a greater reliance on fair value accounting (FVA) principles in financial reporting (e.g. IAS 39; see Leuz and Wysocki (2016) for a review). In terms of microprudential banking regulation, it has been accompanied by a greater emphasis on capital requirements, as in Basel I, II, and III. These shifts in emphasis, and the related, enhanced capital-based supervision, were meant to be accompanied by a smaller safety net; however, as the GFC made clear, (implicit) support for banking (financial) systems remained large, and arguably increased with each crisis.

Table 2
Trends in financial regulation

Structural regulations		Conduct regulations		Prudential regulations	
Functional separation of institutions	↓	Regulations of banks' deposit and lending rates	↓	Deposit insurance	=↑
Entry restrictions	↓	Regulations of fees and commissions	↓	Discount window	=↑
Ownership restrictions	↓	Credit quotas	↓	Restriction on asset concentrations	↓=
Discriminatory rules against foreign investors	↓	Branching limitations	↓	Information disclosure	↑
				Solvency ratios	↑

Notes: Table is based on Vesala (1993), who in turn derived it from Diamond and Dybvig (1986), and Gual and Neven (1992).

While micro-(prudential) based reforms aim to increase buffers in banks, taken together, the FVA principles and capital requirements have been argued to lead to more pro-cyclicality (e.g. Enria et al. (2004); Brunnermeier et al. (2009); Adrian and Shin (2014); see further Allen and Carletti (2008); Plantin, Sapra and Shin (2008); and Rochet in Banque de France (2008); Brei and Gambacorta (2016) provide empirical evidence). Increased pro-cyclicality is, however, just not limited to banks (Turner (2014)). Capital-based (prudential) regulation is now being extended to insurance corporations in the form of Solvency II (Dirks et al. (2014)). Pension funds (defined benefit) have also become more subject to FVA rules and capital-type requirements (e.g. due to the IFRS 13 – Fair Value Measurement and the Solvency Directive in the EU). In some respects, certain institutional investors are more subject to FVA-type rules than banks are (e.g. interest rate changes can be directly reflected in valuations of assets and liabilities of pension funds and insurers, whereas banks' loan books are typically unaffected and liabilities do not need to be mark-to-market, MtM). This worsens the financial system's tendency towards pro-cyclicality, also as non-financial corporations with large financial activities are affected too.

Empirically, these effects for non-banks have been found recently in the case of German government bonds, where, as interest rates on long-dated Bunds declined, insurers that were trying to match asset with liability durations ended up "reaching for duration". As they did so collectively, they pushed interest rates down even further, leading to yet wider duration gaps (Domanski, Shin, and Sushko (2015)). Similar effects appear present in the Netherlands. Dutch pension funds are required to MtM their liabilities using market rates and are monitored on their funding ratios. When rates declined, funds tried to hedge their liability risks, driving rates further down,

although the regulator responded by allowing funds to smooth the daily effects of interest rate changes over a three-month period (Dirks et al. (2014)). As corporations had to increase contributions and benefits were cut, further adverse economic consequences followed.

Regulatory trends extend many of these changes to other financial system segments (FSB (2015c)), which have also grown post-crisis (FSB (2015a)). For mutual funds, enhanced requirements have been adopted for MtM and FVA reporting, for more disclosures of net asset values (NAV), for minimum cash balances, and sometimes for capital akin to banks. Although harder to calibrate and fine-tune, such bank-type rules are also being considered for other forms of market-based financing, such as open-end, collective schemes and hedge funds. To reduce the risks of runs and market disruptions, redemptions may be restricted through various tools (fees, gates, suspensions, and requirements for payments in kind). And at the financial activity (instrument) level, minimum margin and haircut requirements akin to capital and leverage requirements are being considered, besides at the bank-to-non-bank level (i.e. securities financing transactions), at the non-bank-to-non-bank level to limit the build-up of leverage (FSB (2015c)).

While there are many investor, consumer protection and microprudential benefits of extending these and other measures to these (growing) segments, on their own, many can increase pro-cyclicality and possibly lead to financial stability risks. Put differently, also to the extent that problems in banking systems are related to the regulatory model used, exporting this model to other, very different parts of the financial system is not necessarily optimal. Using the same approach would reduce financial system diversity (for a model, see Malherbe and Wagner (2016)). It would furthermore undermine the comparative risk-taking advantage of specific investors. Insurance corporations, for example, should by nature be good at classifying assets by risk and provisioning for potential losses over long cycles, using both data and qualitative insights. By encouraging quantitative, “Value at Risk”, and similar modeling that rely heavily on short periods of data, this advantage of rating “through the long cycle” is lost. Also, such models are likely to encourage certain asset allocations, notably more fixed-income, leading to perverse asset liability management effects (e.g. Merton and Muralidhar (2015)) and possibly reducing the supply of long-term equity financing. Furthermore, trying to regulate every aspect of finance may end up in ever greater regulatory and financial complexity, an “arms-race” which regulators will likely lose (Haldane and Madouros (2012)). As such, current (planned) reforms may neither decrease the volatility of market-based finance nor reduce overall systemic risk.

4.3 Recent regulatory trends and reversals

There have been many regulatory reforms recently (FSB (2015b), reports on reforms; Claessens and Kodres (2016), review in general; Beck, Carletti, and Goldstein (2016), Europe specifically). Although many have not yet been tested, reforms primarily aim at stronger banking systems with higher capital buffers. Importantly, reforms do not fundamentally challenge the self-regulation and market

discipline paradigm and few reverse regulatory trends. Structural measures proposed, and adopted in some cases, include those of Vickers, Volcker, and Liikanen. These rules, although difficult to implement and coordinate internationally and costly for financial institutions, can have direct financial stability benefits (see Gambacorta and van Rixtel (2013)). Other structural measures are for derivatives to be moved to exchanges and conducted through central counterparties (CCPs). At the same time, such moves can create new too big to fail institutions and need not reduce overall systemic risks (e.g. in the case of adverse selection; Glasserman and Ghamami (2016); see further Singh (2014)). Other, “conduct”-type measures adopted or proposed are the liquidity coverage (LCR) and net stable funding ratios (NSFR), meant to complement Basel III capital adequacy requirements. They can, however, make banks more akin to narrow banking and tie up scarce collateral. In terms of shadow banking, reforms have limited the scope for regulatory arbitrage and increased the costs for banks’ securities financing, and thus reduced “puts” from the regular banking system. But some of these measures, besides being hard to calibrate, fine-tune, and implement, challenge how far one wants to draw the regulatory perimeter.

The most important “conduct” reversal has been the application of macroprudential policies to banks (Claessens (2015), reviews). They can be powerful as they directly affect (aggregate or sectoral) financing, and thereby reduce the incidence of booms and busts, notably in housing markets. Macroprudential policies as applied to banking are, however, still at an early stage, with many questions about adaptations to circumstances, and interactions with other policies.²⁶ They impose costs on financial intermediation and the real economy. They also mean governments directly interfere in resource allocation, raising questions on how best to address regulatory governance and political economy issues, including in balancing rules and discretion, and on institutional design, including intraregional (e.g. see Hartmann (2015), for real estate markets in Europe). And while they can reduce credit growth, such policies can lead to spillovers to other parts of the financial system and internationally. Some research (e.g. Cizel et al. (2015)) documents that these policies are accompanied by increases in non-bank credit, with effects particularly strong for quantity-based measures, and stronger in advanced economies than in emerging markets. Cerutti, Claessens, and Laeven (2016) report evidence of more evasion in more developed markets and policies leading to more cross-border banking flows. Evidence collected under the International Banking Research Network similarly shows both leakages and (unintended) spillovers across systems (Buch and Goldberg (2015, 2016)).

As such, more data and research on the effects, risks, and calibrations of macroprudential policies are needed. This applies even more so regarding macroprudential policies for non-banks, often referred to as shadow banking, which is rapidly evolving, in part due to low interest rates in many countries. Since it varies a great deal across countries, analyzing shadow banking’s proper origins calls for a conceptual definition. Claessens and Ratnovski (2015) define shadow banking as “all

²⁶ Most complications arise from interactions with monetary and microprudential policies. Wagner (2014) provides examples of how in banking some counter-cyclical macroprudential policies can perversely affect microeconomic behavior, with possible adverse financial stability implications. He also discusses how to best adapt policies.

financial activities, except traditional banking, which rely on a private or public backstop to operate” (for other definitions, see IMF (2014), App. 2.1). This backstop can come from financial institutions, the state or central bank, and through regulations, with the priority granted to qualified financial contracts, QFCs, one such form (Duffie and Skeel (2012)).²⁷

This definition makes clear that many forms of finance sometimes lumped with shadow banking – leasing, factoring, insurance, hedge funds – do not belong to it unless they have a backstop (and as such these forms of financing do not deserve the negative connotation associated with shadow banking). And it shows that shadow banking cannot grow without bounds, as backstops are finite. At the same time, it acknowledges that many activities – wealth management products, lending by bank-affiliated finance companies, crowd-funding schemes and sometime mutual funds – can only operate with explicit or implicit backstops. As such, it makes clear that many of the shadow banking activities prior to the GFC that led to instability – and some still ongoing – are forms of regulatory arbitrage, with banks or the state providing too generous support. While recent efforts in many countries have reduced the scope for backstops from the regular banking system, including through greater transparency and limits and requirements on securities financing transactions (FSB (2015c)), regulations and supervisory oversight still have to address many of the systemic risks arising from shadow banking activities and entities involved themselves (Claessens et al. (2012)).

4.4 Areas for further reform of regulation, tools and approaches

Regulations should be adapted in the light of structural real and financial sector changes to achieve better outcomes. On the supply side, by forsaking structure and conduct rules, and emphasizing disclosure and capital-based regulations, regulatory trends have encouraged more pro-cyclical systems. While there are some reversals, including through recently adopted microprudential and macroprudential policies, steps are still too timid. There is a particular need to revisit regulatory approaches to non-bank financing, which cannot rely solely on market discipline – based on disclosure, capital, and fair value accounting and reporting – and be “clones” of bank-type regulatory models. Macroprudential policies need to be extended to non-bank financial activities, including using state-contingent policies, akin to counter-cyclical capital buffers. Pro-cyclicality induced by FVA and reporting, risk management tools, and compensation schemes, needs to be reduced by adopting more “through-the-cycle” approaches (see further Claessens and Kodres (2016)). As risks arise in unexpected ways, some discretion will be unavoidable, which may include a “third supervisory pillar” for capital market-related institutions, to allow for tailored requirements, although in line with pre-determined principles. And supervisory agencies need to be willing to designate non-bank financial institutions and activities systemic, and require macroprudential “add-ons” for institutions and activities.

²⁷ Reforms have been proposed for treating some QFCs differently, including adding them for a short period to an automatic stay.

Besides specific reforms – many going beyond what is in place or under way – there are implications in terms of tools and approaches. Clearly, there is a need to consider regulatory changes in a more general equilibrium context, both static and dynamic. From a static perspective, this means considering the costs and benefits of various regulatory policies, and considering whether specific goals can be achieved more efficiently. Dynamically, this requires asking more explicitly what (changes to) rules might do to the incentives of agents involved, including all types of financial institution and market stakeholders, and how their incentives may evolve. Analyses need to be holistic – examining interactions between and across institutions, markets, participants, and jurisdictions, and across types of risks (e.g. market, credit, liquidity, and operational). And they need to actively anticipate the side effects of regulations or actions, both within and across jurisdictions, so as to help avoid unintended, but perhaps predictable consequences.

In terms of approaches, since the regulatory perimeter is getting very large and supervisory resources remain limited, regulations at microprudential and macroprudential levels have to develop more synergies between market and regulatory disciplines. Clearly, market discipline has its limits, as the GFC revealed, and regardless requires certain preconditions, including a limited safety net. Nevertheless, many data and disclosure enhancements are still to be made, including with regard to banking system data (e.g. Gandrud, Hallerberg, and Veron (2016) find limited improvements in the EU). Although non-bank financial intermediation already relies much on market signals, there are ways to enhance and use these in more synergetic ways, including for supervision. Obviously, microprudential supervisors can and do benefit from market signals, and, in principle, total loss-absorbing capacity (TLAC) and bail-in requirements aim to enhance market discipline. And the microprudential case for using such signals to discipline bank regulators has been convincingly made. But market and regulatory discipline symbioses can be increased everywhere.

By its motivation and design, the macroprudential policy function already takes clues from (aggregate) bank behavior as to when and how to invoke rules, as in the systemic surcharge and the counter-cyclical buffer. This can be further improved through enhanced reporting requirements, allowing for better data, analyses, and signals that are macroprudentially useful. As the degrees of issuance of “private” money and use of pledged collateral can be harbors of systemic risk, they can be better tracked. The various senior lending and credit officers’ surveys are examples of useful qualitative information that can be expanded upon, e.g. by asking asset managers (conditional) questions. A more formal systemic risk measurement tool is the liquidity mismatch index proposed by Brunnermeier, Gorton, and Krishnamurthy (2014). (Other examples are in Brunnermeier and Krishnamurthy (2014), and the survey by Biais, Flood, Lo, and Valavanis (2012).)

The case where the macroprudential policymaker takes clues from asset prices and financial markets (e.g. to detect “excess” supply or demand) needs more thought. Clearly, market discipline can be perverse, as in the paradox that asset prices are most elevated, and spreads and volatility lowest, when risks are high. As market-based finance grows, it is more likely that macroprudential (and microprudential)

agencies are wrong-footed as asset prices and fundamentals do not align. As such, how to get better macroprudential relevant signals from asset prices and markets needs more thought. One proposal is to auction off systemic risk rights or insurance (see Kashyap and Stein (2004), for a case for “cap and trade” regulation for banks; and Stein (2012), for the rights to issue money when there are externalities). But others are needed.

The ongoing changes in financial systems and structures globally require, besides proactive and more holistic regulations, also more adaptive oversight, including a more hands-on approach to market-based financing. As recent experiences show, systemic risk in today’s financial systems arises endogenously and cannot be fully captured by metrics that are static or backward looking. Complementary to market discipline (supported by better and more publicly disclosed data), system-wide financial stability reports and stress tests (to cover bank and market-based financial activities, include direct and indirect feedback effects, and assess solvency and liquidity risks) are needed to assess risks and guide interventions. For example, with enough data, one can assess risks of fire-sales through spillovers between mutual funds (see further Constâncio (2016), for macroprudential stress tests, including those applicable to shadow banking). Since one can and should not aim for full regulatory predictability, it will be necessary to define the toolkit of interventions and its governance using key, high-level principles, rather than very detailed rules. At the same time, regulatory “sandboxes” can be used for new developments, e.g. fintech.

How to best conduct this oversight, national, regional and global, is an issue of regulatory governance: what kind of objectives, accountability, resources, and powers does one assign to which relevant regulatory and supervisory agencies so that they can best respond to changes (Barth et al. (2012)). This also applies to most market-based financing, notably those associated with shadow banking.

Improvements will have to include greater mandates for regulators, allowing for more oversight, and requiring securities markets’ regulators to consider systemic aspects. In many countries, this will mean revisiting (intra-)regulatory structures and in general assuring more cooperation between agencies, including across countries, notably for those financially integrated (e.g. in the EU and eurozone, using the European Systemic Risk Board (ESRB), the Single Supervisory Mechanism (SSM) and other mechanisms).

5 Final observations and caveats

Changes in financial systems require revisiting regulatory approaches. Evidence presented, and more general corporate finance and other research, suggest a need in many advanced countries for much greater capital market development to support new sources of growth and innovation. As future economic growth will require greater investments in intangibles and less in fixed investment, more equity financing is especially needed. For some countries, notably civil law, bank-based systems, this means fundamental reforms. It can be helped by deeper financial integration, including through initiatives such as the capital markets union, although this does not mean a standard approach, especially if rules are of a low common denominator. It

is also crucial to improve those market parts that did not function well before the GFC, e.g. securitization.

Besides encouraging equity financing, at times the productivity of what is being “financed” – new investments, existing assets, consumption, or intra-financial system exposures – can be investigated. A big issue here is the amount and form of housing finance given, besides its large role in booms and busts, its limited productive impact (Beck et al. (2012); Cournede and Denk (2014)). Besides stricter macroprudential policies, the demand for and supply of real estate financing need to be better matched. While institutional investors’ supply of funds matches liquidity and maturity risks, current rules do not always encourage this safely and without subsidies. Another issue will be addressing the demand for safe assets in less risky ways, including by (more) explicitly supplying short-term government bills in response to private demand (Pozsar (2011)). Both reflect the more general point that policymakers have some role in measuring and tracking the productivity of what is financed (Bank of England (2016)) and the demand for specific forms of finance.

These recommendations come with many assumptions and caveats. They assume a sensible approach to post-crisis restructuring in many advanced countries, including policymakers to reduce quickly the stock of non-performing loans, close weak banks, and rationalize overbanked systems burdened with poor cost efficiencies. Recommendations neither entertain large-scale “redesigns,” e.g. of money issuance, banking charters and the like. They acknowledge that many drivers are not easy to change: the financial system, including its structure, is determined by many factors, including a country’s legal system(s), property rights, taxation as well as overall ownership structure, degree of inequality, and social compact, as in the emphasis on home ownership, specific forms of providing social security, and related political economy (Rajan and Zingales (2003b)).²⁸ And many – the designs of bankruptcy and corporate law, the efficiency of its judicial system, and the tax code – are outside the purview of the financial regulator. At the same time, financial systems easily adapt to many aspects, including regulations. As such, it is hard to target an “optimal” financial system. Rather, most often regulations will be about trying to avoid dark corners and not to do harm – including by mostly not interfering with market allocations, than trying to fine tune systems. Indeed, it is now well understood that the biggest issue is to reduce the distortion from an (implicit) safety net and related moral hazard. And supervisory actions will often be about responding to financial turmoil, and using proper crisis management and resolution tools, than about preventing every crisis.

The paper also comes with some trepidation. Markets do not deliver first-best outcomes. But neither do governments, central banks, or regulatory agencies. While there are market failures, bureaucrats thus can and should not control financial systems. This is the more so as knowledge is lacking: what exactly are the externalities? What is the role for cognitive biases? Many partial effects are not well known, e.g. how much competition is optimal? And, conceptually and empirically, a

²⁸ For example, demand for finance can arise in part because some activities previously provided publicly are privatized (e.g. social security, infrastructure, insurance). More generally, demand for finance arises from decisions in many social and economic areas.

general equilibrium approach to regulation, including various endogeneities and feedback effects, is far off. As such, both the Lucas critique – general equilibrium effects are hard to assess – and Goodhart’s law – evasion occurs when something is being targeted – very much apply. Can one thus really do better? Larry Summers, paraphrasing Churchill’s comment on democracy, once stated that: “Capitalism is the worst form of economics – except for all the others that have been tried.” Applied to financial architecture and regulation, this may mean that open, transparent, diverse, and contestable financial systems, while not perfect, are the best to aim for.

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