



The future of financial intermediation and regulation

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It is my pleasure and privilege to speak to you today at this Second Conference of the ESCB Macro-prudential Research Network. The concept of macroprudential regulation has been at the core of BIS thinking for three decades. BIS archivist Piet Clement believes that the term was first used internally in the late 1970s.² He dates the first public use to a report published in 1986, where it is defined as a policy that promotes “the safety and soundness of the broad financial system and payments mechanism”. Your research network’s terms of reference clearly echo this definition, stating that the primary topic of study is “macro-financial models linking financial stability and the performance of the economy”.³ In my remarks this morning, I will take a step back from the detailed work that is the core of the research network’s mission, and ask the question that I believe to be at the heart of the challenge we face today: What financial regulatory structure will deliver the right balance between growth and stability?

Even to ask the question reveals my belief that finance and financial innovation are essential to growth. But, as we have seen time and time again, finance is a two-edged sword. As indispensable as it is to propelling growth, the financial system can grow so fast and get so big that it turns into a drag on activity.⁴ As recent events have shown yet again, the fundamental links between the real economy and the financial system make it difficult, if not impossible, to isolate the former from shocks originating in the latter.

What this means is that the size and structure of the financial system have aggregate real consequences. These externalities justify regulation. And regulation, while necessarily focusing on the incentives and actions of individual agents and institutions, has systemic stability as its ultimate objective. That is, all regulation is macroprudential (with or without the hyphen). So, I use the term *prudential* in this context: the reason to proscribe certain activities, to constrain certain actions, and to require certain behaviours is to not to protect individuals from facing the consequences of their own actions. Rather, it is to keep the

¹ I thank Anastasia Kartasheva, Robert McCauley, Nikola Tarashev and Kostas Tsatsaronis for their contributions to this presentation. The views expressed here are those of the author and do not necessarily reflect those of the BIS.

² See P Clement, “The term “macroprudential”: origins and evolution”, *BIS Quarterly Review*, March 2010, pp 59–67.

³ See http://www.ecb.int/home/html/researcher_mars.en.html.

⁴ S Cecchetti and E Kharroubi, “Reassessing the impact of finance on growth”, *BIS Working Paper*, no 381, July 2012, examine the relationship between the size and growth rate of the financial sector and real growth.



negligence, miscalculations, and errors of one individual or institution from affecting the system as a whole. Put slightly differently, the authorities' responsibility is to manage risks for the financial system, ensuring that it contributes to strong, stable and sustainable growth, by reducing the probability and severity of bad events.

To play an appropriate role in the economy, balancing its contribution to growth and to stability, the banking sector must be efficient and resilient. It must be efficient both in providing critical services at low cost and in responding flexibly to evolving demands. And it must be resilient to shocks that might interrupt its ability to provide core functions to the real economy.

Over the past three years, we have made tremendous progress. I think it is fair to say that the financial system today sits on more solid foundations than it did at the onset of the crisis half a decade ago. And we have adopted an approach aimed squarely at reducing externalities and enhancing systemic stability – a macroprudential approach – in our regulatory reform. That said, I believe that this is a good time (and this is a good place) to step back and to assess where we stand. To ask what we want the financial system to look like 20 years from now, and how should we design financial regulation to deliver it?

Answering this question requires that we know what we want the financial system to do. That is, we need to understand what we want a financial institution to look like – its size, scope and complexity – we need to have a good sense of its appropriate role in the economy (and society). With this understanding of the fundamental roles of finance, we can then start to think about structure. Only then can we turn to regulation.

What I have just outlined is a very tall order. It is more the outline for a research programme than the structure of a single talk. Nevertheless, here goes.

What banks do

It is worth starting with a textbook list of the roles of financial intermediaries:⁵

1. Pooling savings: Accepting resources from a large number of small savers in order to provide large loans to borrowers.
2. Safekeeping and accounting: Keeping depositors' savings safe, giving them access to the payments system, and providing them with accounting statements that help them to track their income and expenditures.
3. Providing liquidity: Allowing depositors to transform their financial assets into means of payment quickly, easily, and at low cost.
4. Risk-sharing: Providing investors with the ability to transfer and diversify risk, even small investments.
5. Information services: Collecting and processing large amounts of standardised financial information in order to screen and monitor so as to avoid adverse selection and moral hazard resulting from information asymmetries.

⁵ This list is based on the one in Chapter 11 of S Cecchetti and K Schoenholtz, *Money, Banking and Financial Markets*, Third Edition, McGraw-Hill Irwin, Boston, 2010.



Beyond this skeletal (undergraduate) list, we could add a few more sophisticated (graduate school) tasks that we ask intermediaries take on:

- Providing payment services across borders and currencies.
- Extending credit, to allow households and firms to smooth consumption and investment in the face of variation in income and revenue.
- Underwriting securities so that corporations and governments can finance themselves more cheaply and efficiently.
- Acting as derivative counterparties, to help businesses manage a myriad of risks.
- Serving as market-makers in securities markets.

It is fair to say that we need to retain access to all of these services. And, importantly, we want to encourage the adoption of process improvements and new products that provide services more broadly, cheaply and effectively.

As we think about the best way to deliver this wide (and evolving) array of services, I would caution against introspection. The vast majority of us rarely demand more from the financial system than simple payment services. However, large corporations are quite different from you and me. For example, the Basel-based pharmaceutical giants Roche and Novartis need multicurrency treasury and financing services that span the globe. With production lines and customer bases around the world, such large corporations need a bank that can manage exposures to different business and financial cycles. And to hedge, they need a bank that can help them issue debt in different parts of the world, subject to different legal systems.

Those are the basic ways banks add value to the economy. The issue is how best to deliver these services. I will return to issues of size, scope and complexity in a few minutes. But, first, let me turn to why we need regulation.

Why we need regulation

Although we all agree that an economy needs banks, we face a problem because, owing to distorted incentives, banks create externalities. And, as a consequence of information asymmetries, it is difficult, if not impossible, to bring market discipline to bear effectively.

The fundamental problem is that the private interests of banks and bankers can diverge from those of society at large. This is especially true when it comes to the stability of the system and the direct or indirect burden on taxpayers. The source of this conflict is limited liability: the fact that owners and employees are not held financially accountable beyond their initial investment. What this means is that the bank's owners and managers have a call option on the firm. Finance theory tells us that, everything else equal, this option will be more valuable the higher the volatility of the firm's assets. More volatility means a higher probability of both a large positive and a large negative payoff. The option created by limited liability means that the increased upside is greater, but the increased downside is irrelevant.

All of this creates an incentive for increased leverage. Leverage brings the call option closer to being at the money, where the value of the optionality (the gap between the option's price and its intrinsic value) is greatest. It is therefore very much in the interest of both the bank's owners and its managers to pursue volatility-inducing strategies and to lever up as much as possible. And, departing from the typical option-pricing assumptions, they rationally pursue strategies that conceal tail risks and thus lead to underpricing. Keeping with the option metaphor, bankers write implicit out-of-the-money puts on credit and liquidity that are not priced. The result is low measured volatility and high earnings in good times (risk-adjusted expected returns appear high), but potentially large losses and high volatility in bad times (surprisingly high correlation with the market as a whole on the downside). This increases the value of their option.



While all limited liability corporations are subject to this same phenomenon, for banks the problem is intensified by three things. First, there is the fact that intermediation is, at its core, based on leverage. Second, because banks collect and analyse information to screen and monitor borrowers, their balance sheets are necessarily opaque. And third, the safety net, and especially deposit insurance, removes the incentive for most of a bank's liability holders to monitor the bank's activities.

Clearly, this private desire for volatility and increased risk can contradict the public interest for a stable, safe and resilient financial system. We respond with regulation: regulation that forces the bank's owners and managers to face the consequences of the volatility that they create. That is, regulation that demands that the bank be less leveraged, aligning the owners' and managers' interests more closely with those of the public at large.

It is interesting to note that evidence suggests that banks' incentives for risk-taking have not served investors' long-term interests. On a risk-adjusted basis, the return on financial stocks has been lower than the return on non-financial stocks over the last 40 years in a number of countries. And, to make matters even worse, financial stocks somewhat outperform the rest of the market in good times, but seriously underperform in bad times. That is, banks do the worst when investors need them the most.⁶

Beyond the incentive for individual institutions to take on more risk than is socially desirable, another externality arises from the important role that some intermediaries play in the economy. Interconnections among financial institutions and, quite often, just their sheer size means that the failure of a single bank could reverberate widely, unpredictably and destructively through the rest of the economy. The Lehman failure provided a clear illustration of what can happen. However, it is naïve to expect that any private stakeholder in a bank will ever internalise the externalities of a failure and police a bank's managers with the public good in mind. In other words, it is naïve to expect that market discipline alone will deliver financial stability.

Finally, when banks are important players, they enjoy exceptional privileges in addition to those accorded by limited liability. Systemically important institutions benefit from explicit or implicit government guarantees that go well beyond those of simple deposit insurance, insulating many stakeholders in a bank from the downside risks embedded in its risk-taking activities. This amplifies the misalignment of public and private interests, further increasing the risk-taking incentives that I just mentioned.

Credit ratings provide a glimpse into the impact of government guarantees. Ratings agencies assign two types of ratings: stand-alone ratings that reflect a bank's inherent financial strength and factor out official support, and all-in ratings that reflect both the institution's inherent strength and the likelihood and extent of official support. The difference between the two is an estimate of the enhancement to banks' creditworthiness due to official support. At end-2011, such enhancement lowered the spreads that banks had to pay for long-term bonds by an estimated 1 to 2 percentage points, or by 10 times more than prior to the crisis.⁷

So, private sector discipline is part of the problem. Investors encourage intermediaries to increase leverage, to increase risk and to exploit government guarantees. And bankers make the problem worse by building opaque and complex institutions. What we need to do is to make sure that regulation complements and reinforces the private sector, making investors in banks aware of the fact that bank managements acting in their own parochial interests do not always serve the interests of shareholders, much less those of society at large.

⁶ See Bank for International Settlements, *80th Annual Report*, 2010, Chapter VI.

⁷ See Bank for International Settlements, *82nd Annual Report*, 2012, Chapter VI.



How big and how complex do banks need to be?

We need intermediation and we need regulation. But we also need to have some idea of what we want banks and the financial system to look like. It is fairly straightforward to write down a set of principles that can guide us in thinking about this. Here is where I start:

- (i) The financial system should be safer, simpler and smaller.
- (ii) The system should be able to withstand the failure of any institution.
- (iii) And all financial institutions should be transparent enough for authorities, managers and investors to understand.

We need to translate these principles into a set of characteristics for the system. In thinking about size, and complexity, I am immediately led to focus on failure. The system should be able to manage the failure of any single institution. Simple to state, this requirement has proven remarkably difficult to implement. And, the difficulty has increased as banks have made themselves bigger and more complex over the past several decades.⁸

The growing scale and scope of individual institutions' activities means that a bank, especially a large and globally active one, is no longer simply an intermediary between household depositors and firms seeking project financing. By assuming risks through derivative contracts and making markets in securities, dealer banks form a highly concentrated and interconnected system at the centre of today's financial markets. As a result, the usual regulatory tools have lost much of the power they once had to discipline individual banks and to manage individual failures safely. Everyone – investors, borrowers, depositors, authorities – has come to believe the failure of some institutions will inflict much higher costs on the economy than that of others. In fact, the Basel Committee on Banking Supervision (BCBS) and the Financial Stability Board (FSB) have developed a framework to assess the systemic importance of large and complex internationally active banks. It imposes a capital surcharge on roughly two dozen institutions in line with the assessed costs to the global economy in the event that they fail. The mere existence of this list is in and of itself an illustration of the problem.

We absolutely must move away from this situation. There should come a day when the FSB's list of G-SIFIs (and the Basel Committee's list of *globally systemically important banks*, or G-SIBs) is blank. That day will come when either the institutions change, the rules change, or both. One particularly appealing suggestion is to find a way to get the authorities to commit not to save the first firm that fails during a period of instability. If the system can live with any single firm failing, there is an incentive for managers, shareholders and creditors to make sure that their bank is not the weakest link.

The point here is that, in a market-based capitalist system, the right to succeed must be accompanied by the opportunity to fail. When managers and investors see that they can fail, they change their behaviour, moderating the risk they take and restraining the leverage they employ. However, market discipline alone can only address the risks that decisions pose for an individual firm and not the risks that the firm creates for others. Only regulators and supervisors can be relied on to concern themselves with the aggregate impact of institution's actions. It is in this sense that all regulation should be macroprudential, forcing private investors to face the social burden associated with banks' risk-taking.

Of course, if such rules are to be acceptable, a failure must be affordable. This brings us to the next desirable feature of the financial system – limited counterparty risk. Again, providing

⁸ For a recent review of the issues and proposals, see Financial Stability Board, *Effective resolution of systemically important financial institutions recommendations and timelines*, 19 July 2011.



cross-border payments and taking on risks through derivative contracts is what we want banks to do. But the growing exposure of financial institutions to counterparty risk arises from the growth of over-the-counter (OTC) markets, where socially useful derivative securities are traded on a socially hazardous, bilateral basis. The nature of OTC agreements creates a complicated network of mutual exposures among institutions.

To see what can happen, imagine a set of 10 or 20 institutions engaged in OTC activities. Think of them as being arranged in a circle. And, assume that each actor has a long position with the person to his or her right and a short position in the exact same contract with the person to his or her left. Everyone in this (figurative) circle is perfectly hedged with a zero net position. But think of what happens if one of the people goes bankrupt and the circle is broken; things could unravel.

Because of the way institutions normally operate, this example is not hypothetical. In fact, it is common to unwind a derivative position not by buying back the original contract from the original counterparty, but rather by entering into a new derivative contract for an offsetting payoff with someone else! As a result, any serious deterioration in the financial quality of one of the dealers, with the resulting flight to quality by its counterparties, creates a surge of demand for new derivative positions with other counterparties.

This counterparty risk can be reduced substantially by moving to centralised clearing. The basic idea is that a central clearing counterparty intermediates the trades and acts as the counterparty to both sides of every contract. The central counterparty requires trading firms to post an initial performance margin and subsequently the positions are marked to market. Banks and investors then deal with the central counterparty, netting positions, dramatically reducing interconnectedness and the possibility of a systemic collapse.

For this system to work, the central counterparty has to be well capitalised and the margin requirements need to reflect the price volatility of particular securities. Also centralised clearing requires a certain level of standardisation and liquidity in derivative securities. In practical terms, the transition to central clearing requires measures to encourage banks to clear a larger fraction of derivative positions, and to differentiate regulatory capital charges for contracts that are centrally cleared from those that are not. One possibility is that regulated financial institutions might only be allowed to buy and sell derivative contracts that are centrally cleared. That is, they could hold only standardised instruments. This would reduce opacity, complexity and interconnectedness, making it easier to monitor both individual institutions and the system as a whole. Failures could be made affordable, and the system more robust.

I should note that it is straightforward to allow scope for innovation in a world where regulated entities are not allowed to hold bespoke derivative instruments. OTC markets would exist, new products would appear there, and there they would be tested. But the development, testing and ultimate standardisation of new financial products would be subject to strong regulatory requirements analogous to those for pharmaceuticals. Only after it has proved itself in small-scale tests would a financial innovation be allowed into the broader marketplace. And even then, certification for use by retail investors would only occur after substantial additional experience.

Regulation to deliver these objectives

This brings us to my final topic: the structure of financial regulation. How should we structure bank regulation to deliver the objectives of a banking system that delivers the services we need, where individual failure is possible and expected, and where innovation is pervasive and safe? How complex and how extensive should regulation be?



My answer is that regulation should be simple, but not simplistic. Practically, here's what that means. Since regulation must be directed at reducing the impact of externalities, all calibration should be designed to control systemic risk.

Turning to some specifics, recall that banks have an incentive not only to take on too much leverage, but to take on too much risk *for a given amount of leverage*. It is for this reason that regulation must remain risk-sensitive. But implementing a system of risk weights requires that someone be able to measure the relative riskiness of different assets. This is a difficult task, as there may not be much data available.

While my proposal that new financial instruments go through a trial period before they can be held by regulated institutions will help, it will only get us so far. In the end, the risk weights are sample estimates. I mean that in the strict statistical sense. And, since risk weights are estimates they have sampling variation. So, if we were to run history over again, we would get a different realisation of the data and a different point estimate for the risk weights.

To see what this means in practice, consider two assets – call them 1 and 2. In reality, asset 1 is less risky than asset 2. But because of the noise in the data, when the regulator goes to estimate the risk weight, the result is that the weight on asset 1 is higher. That is, the data make it appear as if asset 2 is less risky. Institutions react rationally to this, and the result is a system where more risky assets are held simply because of unavoidable statistical uncertainty.

The problem I have just described exists even when everyone uses the best data available, state-of-the-art techniques and does everything absolutely correctly. It is unavoidable. And, this sort of statistical uncertainty or estimation noise is not diversifiable.

The solution is not to throw risk adjustment out the window. That would be the simplistic response. Instead, we need the simple response, namely to make risk adjustment simpler. That means a coarse scale of regulatory risk weights. When a ranking of riskiness cannot be made with real confidence, assets should be lumped together.

But leverage does matter, so a simple leverage ratio is an essential backstop to the risk-sensitive measure. An unweighted measure helps to contain the build-up of systemic risks that can arise from mismeasurement, especially during booms. It respects the essential difficulty of measuring and controlling risk, even for the most technically skilled and well intentioned bankers and supervisors. These systems are built by people, so they can never be entirely fail-safe. But having several layers of protection for something that is at the core of our economic system seems like a fairly basic precaution.

Conclusion

To conclude, let us return to where we started. First and foremost, we need to think of all financial regulation as directed at reducing the systemic risks arising from the fact that individual financial institutions do not face the full social cost of their actions. In other words, it is all macroprudential. That means that all capital and liquidity requirements should be calibrated from the perspective of systemic financial stability.

As for specifics, I support a short list:

- The system should be able to withstand the failure of any individual institution.
- Financial institutions must clear all derivative trades through central counterparties.
- Financial innovations must be tested and certified before they can be widely adopted.
- Capital regulation must be risk-sensitive, but simple.
- Every financial institution should face a leverage ratio constraint as a backstop.

Thank you.