Post-Crisis Banking Regulation

Evolution of economic thinking as it happened on Vox

Edited by Jon Danielsson

CEPR Press

A VoxEU.org Book

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Centre for Economic Policy Research (CEPR)

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The Systemic Risk Centre (SRC) was set up in 2013 to study the risks that may trigger the next financial crisis and to develop tools to help policymakers and financial institutions become better prepared. Based at the London School of Economics and Political Science (LSE), the Centre is generously funded by the Economic and Social Research Council (ESRC) [grant number ES/K002309/1].

The primary goal of the SRC is to build up research findings across the broad area of systemic risk and to use these to construct practical tools for policymakers and private institutions to achieve a better understanding of the risks they face. The unifying principle of the Centre's agenda is endogenous risk – the notion that financial risk is created by the interaction of market participants.

The SRC is rooted in a multidisciplinary approach, bringing together experts from computer science, law, political science and the natural and mathematical sciences, as well as from finance and economics. This enables our researchers to investigate how risk is created through feedback loops within and between the financial, economic, legal and political systems.

The SRC runs frequent conferences, seminars, masterclasses and other events to facilitate and enhance collaborations and exchange of ideas.

The Directors of the SRC are Jon Danielsson and Jean-Pierre Zigrand.

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Foreword

How were financial regulators, the people best placed to assess the susceptibilities of the financial system to reckless risk taking and wealth imbalances, caught so much off guard by the Global Financial Crisis? As the catastrophe unfolded, academics struggled to comprehend events and produce coherent explanations of the phenomenon. Explanations took form only to be replaced by competing theories within months. Eventually a consensus was reached that the Crisis was the result of excessive deregulation, and could be resolved only by more intense regulation. But outside of the US, away from the Glass-Steagall Act, the replacement of sweeping restrictions with micro-regulation has failed to solve the problem.

A viable answer to the issues arising from financial regulation requires a more nuanced debate, and this is exactly what has occurred on VoxEU. Leading economists have analysed every aspect of the banking regulation debate, and their conclusions have shaped the regulation agenda.

This eBook is the first of a series entitled *Vox As It Happened*, created to record the progress of thought as key economic events unfolded. It collects some of the best Vox columns on financial and banking regulation, covering a wide range of topics from the fundamentals of regulation to bank capital and the broader concerns of potential policy responses. The columns chosen for this eBook represent the scope and complexity of the regulatory debate as it played out on VoxEU. While the contributing authors' conclusions differ, they collectively convey the intricacies of the policy problem and the challenges ahead for policymakers. Over the course of this debate taking place, our understanding of how best to pursue safe financial regulation that also fosters economic growth has improved immeasurably.

CEPR is grateful to Jon Danielsson for his editorship of the eBook, and to the Systemic Risk Centre for their contribution. We also thank Anil Shamdasani and Shreya Sinha for their efforts in publishing and launching this eBook. The European Commission support for the production of this publication does not constitute an endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein. CEPR, which takes no institutional positions on economic policy matters, is glad to provide a platform for an exchange of views on this topic.

Tessa Ogden
Deputy Director, CEPR
January 2015

Introduction

Jon Danielsson
Systemic Risk Centre, LSE

Everybody seemed to be caught off guard by the Global Financial Crisis that started in 2007, not least the financial regulators. They missed all the excessive risk-taking, the build-up of financial imbalances and the accumulation of vulnerabilities in the years and decades before the Crisis. What went wrong and how can we fix it?

The common refrain has it that there was excessive deregulation and that simply by ramping up regulatory intensity, all will be fine. Does this view stand up to scrutiny? Superficially, the signs point that way. The US distinction between commercial banks and investment banks is no more, and neither is Bretton Woods with its assorted restrictions. However, the rest of the world never had the Glass–Steagall Act, and we just replaced macro-regulations with micro-regulations. Broad-brush activity restrictions were swept away, with regulations controlling the minutiae of banks' operations put in their place. Indeed, the reality is much more complex than most critics would have it. It is not that we didn't regulate with sufficient intensity, we just didn't regulate correctly.

If we want to fix the problem of financial regulations, we need a more nuanced debate, and the place to see that is on the pages of VoxEU.org. The world's leading analysts have debated financial regulations in its columns, avoiding the shrillness of the mainstream media and focusing on solid arguments and sound facts. While the Vox commentators often reach different conclusions, they are precise in their analysis and therefore directly shape the regulatory reform agenda.

This eBook collects some of the best Vox columns on financial regulations ranging over a wide area, starting with the fundamentals of financial regulations, moving on to bank

capital and the Basel regulations, and finishing with the wider considerations of the regulatory agenda and the political dimension. Collecting columns for over the past six years, the eBook maps the evolution of leading thought on banking regulation.

We start with one of the world's most senior regulators during the period of the Global Financial Crisis, Sheila Bair, then the head of the FDIC, who gives a clear 12-point vision of the desirable financial system of the future. She avoids the extremes on either side of the debate and advocates simplicity, efficiency and common sense. This does not mean she avoids controversy, for example when discussing the too-big-to-fail problems, she says: "We have to solve it. If we can't, then nationalise these behemoths and pay the people who run them the same wages as everyone else who works for the government."

Hyun Song Shin, now Head of Research at the Bank of International Settlements (BIS), considers the fundamental problem of financial regulations, arguing that they focus too much on ensuring each institution is well behaved. In his view, this is a fallacy of composition and he wants us to look at the system and macro-prudential rules.

His BIS colleague, Claudio Borio, discusses the practicalities of the macro prudential approach and some of the challenges in implementing it. My own piece is on the theme of complexity, arguing that regulations should focus on simplifying the financial system and on variables that are easy to measure and hard to manipulate, avoiding regulation by models.

One of the most important questions is the scope of banking. Should we implement some model of narrow banking, perhaps separating out regular banking activities and proprietary trading, or otherwise limiting banks to specific activities? Vox has seen its share of columns debating these questions. For example, Arnoud Boot and Lev Ratnovski dislike proprietary trading and advocate the segregation of banking activities, while Charles Goodhart takes the opposite view, arguing that investment banking is essential to the economy and favouring universal banks.

Perhaps the most fundamental and heated debate on financial regulation is the question of bank capital. What is it, what is it for, how should it be calculated and how much should it be? While most agree we have to change the way we calculate capital and that we should have more of it, the Vox commentators disagree on what this means in practice. Raihan Zamil argues that by focusing too much on capital, we miss the big picture, while Jens Hagendorff and Francesco Vallascas maintain that the problem with capital is the way it is calculated – especially the risk-sensitive type – because the risk forecasts are unreliable. One solution would be to calculate capital differently, perhaps with Hans Gersbach's proposal to use average industry equity.

The main controversy surrounding bank capital is the overall level. In the 19th century, banks routinely operated with capital ratios of 40% or more. They have steadily decreased since then. Lev Ratnovski wants capital ratios to be sharply increased – to 18% risk-weighted. Charles Calomiris, while also supporting an increase in capital, worries about the economic impact of increasing capital levels too sharply.

Bank capital falls under the umbrella of the Basel regulations, just like so much of the regulatory agenda. Vox certainly has no shortage of Basel columns. Some see Basel as the salvation – that it is fundamentally important and broadly correct. Others disagree, maintaining that it fails to protect or, even worse, increases financial instability and systemic risk. Avinash Persaud offers a strong defence of Basel III, while Adrian Blundell-Wignall and Paul Atkinson argue that Basel III is out of date.

Stefan Schmitz focuses on one of the main innovations of Basel III: liquidity ratios. He strongly supports them, dismisses critics who say they will have a negative economic impact, and argues that international harmonisation is essential. Not everybody agrees with harmonisation, and Luc Laeven and Ross Levine observe that the governance structure of banks affects how they react to regulations, suggesting that because governance structures differ across countries, one-size-fits-all regulation might be ineffective. One problem with implementing such a broad regulatory agenda as Basel III is that it may not be compatible with other important regulatory initiatives, as discussed

by Takeo Hoshi, who argues that Dodd–Frank and Basel III are partly incompatible, and that Basel III will lead to regulatory arbitrage.

The Vox columns in this eBook have also considered the wider implications of the financial system and financial regulations. Franziska Bremus, Claudia M. Buch, Katheryn Russ and Monika Schnitzer argue that banking systems are highly concentrated, with individual bank credit fluctuations affecting the wider economy. In extreme cases, the financial system may have a sudden cardiac arrest, and Ricardo Caballero shows how government should respond to such an arrest.

Financial regulations focus mostly on banks – or to be precise, financial institutions that are legally defined as banks – but much financial intermediation takes place elsewhere, in the shadow banking sector. Stijn Claessens, Zoltan Pozsar, Lev Ratnovski and Manmohan Singh note that shadow banking is important but has been rather neglected by policymakers. Many proposals advocate bringing several shadow banking or OTC activities directly under the regulatory umbrella, for example by moving OTC trading onto central counterparties (CCPs). This is a concern for Manmohan Singh, who argues that a move to CCPs will just shift risk around and not solve the fundamental problem.

Another area that was neglected by financial regulators was the resolution of failing institutions, especially those that operate internationally. The inherent slowness and the national mandate of the legal system frustrate the efficient resolution of failing banks, as addressed by Martin Čihák and Erlend W Nier, who prefer special resolution regimes.

Financial regulations are inherently political, and often it seems like politics has been the dominating force in both the pre-Crisis regulatory failures and the post-Crisis regulatory reform process. The politicisation of regulation gives much room for lobbying, and Deniz Igan, Prachi Mishra and Thierry Tressel observe that bank lobbying prevented the tightening of regulations before the Crisis.

A commonly proposed solution to the inherent incentive problems in financial regulations is to increase the exposure of individual bank employees to the eventual results of the risk-taking. The authorities, however, have been reluctant to expose individual bank employees too much, the EU bonus cap notwithstanding. One reason may be that the authorities may simply prefer to collect fines from the banks. It might be better to apply fundamental economics to the question of financial regulations, and to follow Enrico Perotti's proposal of a Pigouvian tax on bank's contributions to systemic risk. Perhaps it is time to start locking bankers up when they misbehave, as argued by Giancarlo Spagnolo.

The columns chosen for this eBook represent the broadness and sophistication of the regulatory debate as it played out on the pages of Vox. What emerges from these pieces is the difficulty in regulating a financial system that simultaneously needs to be safe and also contribute to economic growth. What I take from the debate highlighted in this eBook is that our understanding of how best to regulate the financial system has improved considerably since the onset of the Crisis. While the individual writers may disagree on the merits of particular regulatory initiatives, they all recognise the complexity of the problem, and all have made significant contributions to our mastery of financial regulations.

Part I

The reform of financial regulations

1.1 Everything the IMF wanted to know about financial regulation and wasn't afraid to ask

Sheila Bair
Systemic Risk Council

9 June 2013

Does anybody have a clear vision of the desirable financial system of the future? This chapter has one. It gives simple answers to 12 simple questions panellists at a recent IMF conference failed to answer.

I was honoured when the IMF asked me to moderate the Financial Regulation panel at this year's "Rethinking Macro II" conference. And while naturally, I delivered one of the more enlightening and thought-provoking policy discussions of the conference, I did fail in my duties as moderator to make sure my panellists covered all the excellent questions our sponsors submitted to us. Of course, this was to be expected, as panellists at these types of events almost never address the topics requested of them (I certainly never do), but rather, like Presidential candidates, answer the questions they want to answer. However, being the conscientious person I am, who accepts responsibility for my mismanagement (unlike some bank CEOs we know), I will now step up and answer those questions myself.

1) Does anybody have a clear vision of the desirable financial system of the future?

Yes, me. It should be smaller, simpler, less leveraged and more focused on meeting the credit needs of the real economy. And oh yes, we should ban speculative use of credit default swaps from the face of the planet.

2) Is the ATM the only useful financial innovation of the last 30 years?

No. IF bankers approach the business of banking as a way to provide greater value at less cost to their customers, (I know – for a few bankers, that might be big 'if') technology provides a virtual gold mine for product innovations. For instance, I am currently testing out a pre-paid, stored value card which lets me do virtually all my banking on my iPhone. It tracks expenses, tells me when I've blown my budget, and lets me temporarily block usage of the card when my daughter, unbeknownst to me, has pulled it out of my wallet to buy the latest jeans from Aeropostale. The card, aptly called Simple, was engineered by two techies in Portland, Oregon. (Note to mega-banks: Ditch the pin stripes for dockers and flip flops. The techies are coming for you next.)

3) Does the idea of a safe, regulated, core set of activities, and a less safe, less regulated, non-core make sense?

No.

The idea of a safe, regulated, core set of activities with access to the safety net (deposit insurance, central bank lending) and a less safe, *more* regulated, noncore set of activities which *do not under any circumstances* have access to the safety net – that makes sense.

4) How do the different proposals (Volcker rule, Liikanen, Vickers) score in that respect?

Put them all together and you are two-thirds of the way there. The Volcker Rule acknowledges the need for tough restrictions on speculative trading throughout the banking organisation, including securities and derivatives trading in the so-called 'casino bank'. Liikanen and Vickers acknowledge the need to firewall insured deposits around traditional commercial banking and force market funding of higher risk 'casino' banking activities. Combining them would give us a much safer financial system.

But none of these proposals fully addresses the problem of excessive risk-taking by non-bank financial institutions like AIG. Title I of Dodd-Frank empowers the Financial Stability Oversight Council to bring these kinds of 'shadow banks' under prudential supervision by the Fed. Of course, that law was enacted three years ago and for nearly two years now, the regulators have promised that they will be designating shadow banks for supervisory oversight "very soon". This was repeated most recently by Treasury Secretary Jack Lew on 22 May 2013, before the Senate Banking Committee (but this time he *really* meant it). For some reason, the Fed and Treasury Department were able to figure out that AIG and GE Capital were systemic in a nano-second in 2008 when bailout money was at stake, but when it comes to subjecting them to more regulation now, well, hey we need to be careful here.

5) How much do higher capital ratios actually affect the efficiency and the profitability of banks?

You don't have to be very efficient to make money by using a lot of leverage to juice profits then dump the losses on the government when things go bad. In my experience, the banks with the stronger capital ratios are the ones that are better managed, do a better job of lending, and have more sustainable profits over the long term, with the added benefit that they don't put taxpayers at risk and keep lending during economic downturns.

6) Should we go for very high capital ratios?

Yep. I've argued for a minimum leverage ratio of 8%, but I like John Vickers' 10% even better (and yes, he put out that news-making number during my panel…)

7) Is there virtue in simplicity, for example, simple leverage rather than capital ratios, or will simplicity only increase regulatory arbitrage?

The late Pat Moynihan once said that there are some things only a PhD can screw up. The Basel Committee's rules for risk weighting assets are Exhibit A.

These rules are hopelessly overcomplicated. They were subject to rampant gaming and arbitrage prior to the crisis and still are. (If you don't believe me, read Senator Levin's report on the London Whale.) A simple leverage ratio should be the binding constraint, supplemented with a standardised system of risk weightings to force higher capital levels at banks taking undue risks. It is laughable to think that the leverage ratio is more susceptible to arbitrage than the current system of risk weightings given the way risk weights were gamed prior to the crisis, eg moving assets to the trading book, securitising loans to get lower capital charges, wrapping high risk CDOs in CDS protection to get near-zero risk charges, blindly investing in triple A securities, loading up on high-risk sovereign debt, repo financing … need I go on?

8) Can we realistically solve the 'too big to fail' problem?

We have to solve it. If we can't, then nationalise these behemoths and pay the people who run them the same wages as everyone else who work for the government.

9) Where do we stand on resolution processes, both at the national level and cross border?

Good progress, but not enough. Resolution authority in the US could be operationalised now, if necessary, but it would be messy and unduly expensive for creditors. We need

thicker cushions of equity at the mega-banks, minimum standards for both equity and long-term debt issuances at the holding company level to facilitate the FDIC's 'single point of entry' strategy, and most importantly, we need regulators who make clear that they have the guts to put a mega-bank into receivership. The industry says they want to end 'too big to fail' but they aren't doing everything they can to make sure resolution authority works smoothly. For instance, industry groups like ISDA could greatly facilitate international resolutions by revising global standards for swap documentation to recognise the government's authority to require continued performance on derivatives contracts in a Dodd-Frank resolution.

10) Can we hope to ever measure 'systemic risk'?

Yes. It's all about inter-connectedness, which mega-banks and regulators should be able to measure. Ironically, inter-connectedness is encouraged by those %$#@& Basel capital rules for risk-weighting assets. Lending to IBM is viewed as five times riskier than lending to Morgan Stanley. Repos among financial institutions are treated as extremely low risk, even though excessive reliance on repo funding almost brought our system down. How dumb is that?

We need to fix the capital rules. Regulators also need to focus more attention on the credit exposure reports that are required under Dodd-Frank. These reports require mega-banks to identify and quantify for regulators how exposed they are to each other. Mega-bank failure scenarios should be factored into stress testing as well.

[Since these questions relate to financial regulation, I will not opine on measuring systemic risks building as a result of loose monetary policy.]

10) Are banks in effect driving the reform process?

Sure seems that way.

11) Can regulators ever be as nimble as the regulatees?

Yes. Read Roger Martin's *Fixing the Game*. Financial regulators should look to the NFL for inspiration.

12) Given the cat and mouse game between regulators and regulatees, do we have to live with regulatory uncertainty?

Simple regulations which focus on market discipline and skin-in-the-game requirements are harder to game and more adaptable to changing conditions than rules which try to dictate behaviour. For instance, thick capital cushions will help ensure that whatever dumb mistakes banks may make in the future (and they will), there will be significant capacity to absorb the resulting losses. Unfortunately, the trend has been toward complex, prescriptive rules which smart banking lawyers love to exploit. Industry generally likes the prescriptive rules because they always find a way around them, and the regulators don't keep up.

You can see that dynamic playing out now, where the securitisation industry is seeking to undermine a Dodd-Frank requirement that securitisers take five cents of every dollar of loss on mortgages they securitise. They say risk retention is no longer required because the Consumer Bureau has promulgated mortgage lending standards. But these rules are pretty permissive (no down payment requirement, and a whopping 43% debt-to-income ratio) and I'm sure that the Mortgage Bankers Association is already trying to figure out ways to skirt them.

Rules dictating behaviour can sometime be helpful, but forcing market participants to take the losses from their risk-taking can be much more effective. One approach tells them what kinds of loans they can make. The other says that whatever kind of loans they make, they will take losses if those loans default.

1.2 It is time for a reappraisal of the basic principles of financial regulation

Hyun Song Shin
Princeton University and CEPR

31 January 2009

Today's financial regulation is founded on the assumption that making each bank safe makes the system safe. This fallacy of composition goes a long way towards explaining how global finance became so fragile without sounding regulatory alarm bells. This chapter argues that mitigating the costs of financial crises necessitates taking a macroprudential perspective to complement the existing microprudential rules.

The regulatory system stands accused of having failed to provide any check or barrier against the boom-and-bust cycle in the financial system. It was largely a bystander during the build-up of leverage and the erosion of credit standards in the credit boom and has been largely powerless as the boom has turned to bust with a devastating impact on the real economy.

How did we reach this state of affairs?

It was not for want of the quantity of financial regulation, if quantity be measured in terms of thickness of the rule books. The Basel II rules for banking regulation famously generated reams of paper, all the while sapping the energy and patience of the hapless cadre of dedicated officials locked in detailed discussions on the latest bell or whistle to be attached to the rules.

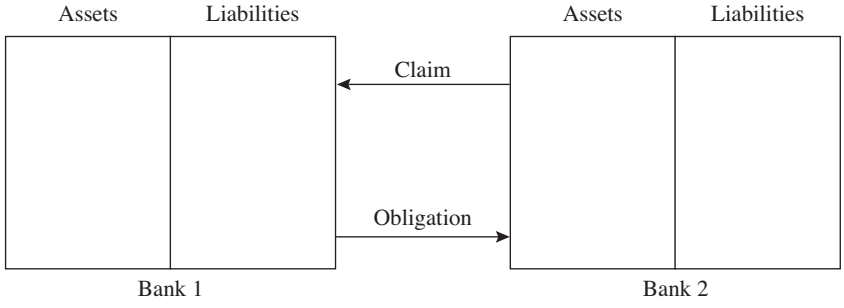
Microprudential versus macroprudential perspectives

Basel II rests on the principle that the purpose of regulation is to ensure the soundness of individual institutions against the risk of loss on their assets. Of course, it is a truism that ensuring the soundness of each individual institution ensures the soundness of the system as a whole. But for this proposition to be a good prescription for policy, actions that enhance the soundness of a particular institution should promote overall stability. However, the proposition is vulnerable to the fallacy of composition. It is possible, indeed often likely, that attempts by individual institutions to remain solvent can push the system to collapse.

Fallacy of composition

Consider Figure 1 below. Bank 1 has borrowed from Bank 2. Bank 2 has other assets, as well as its loans to Bank 1. One day, Bank 2 suffers credit losses on these other loans, depleting its equity capital. The prudent course of action for Bank 2 is to reduce its overall lending, including its lending to Bank 1.

Figure 1 Prudent shedding vs a run



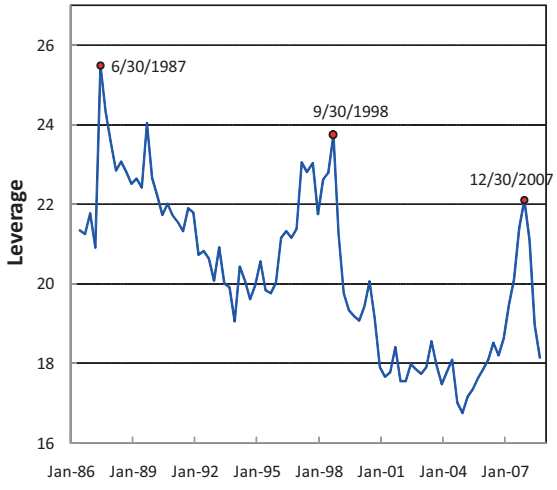
But a prudent shedding of lending by Bank 2 is a run when seen by Bank 1. Arguably, this type of run is what happened to the UK bank Northern Rock, which failed in 2007, as well as to the US securities houses Bear Stearns and Lehman Brothers, both of which suffered crippling runs in 2008.

In this simple setting, it is clear how misguided it would be to induce even greater recoiling from risk on the part of Bank 2 when faced with shocks. But a greater recoiling from risk is exactly what the Basel II rules have managed to hard-wire into the financial system.

Systemic implications of recoiling from risk

In the name of modernity and price-sensitive risk management, Bank 2 is encouraged to load up on exposures when measured risks are low, only to shed them as fast as it can when risks materialise, irrespective of the consequences of the rest of the system. Unfortunately, the recoiling from risk by one institution generates greater materialised risk for others. Put differently, there are pervasive externalities in the financial system. What we are witnessing now in the global financial crisis is that these externalities also extend to the real economy. The loading up and subsequent shedding of risks show up in the leverage cycle of banks, as shown by Figure 2 which shows how each major crisis in recent years has been preceded by a rapid increase in leverage of banks (Adrian and Shin 2009).

Figure 2 US Primary Dealer Mean Leverage (June 1986 – Sept 2008)



Is there a better way? Pigou to the rescue

One textbook prescription to deal with externalities is to impose Pigovian taxes to internalise those externalities. For the smoky factory located next to the laundry, the externality is the pollution emitted by the factory that soils the washing laid out to dry by the laundry. In this case, calculation of marginal costs will enter into the appropriate Pigovian tax on the factory.

How far can we take the exercise of imposing Pigovian taxes to the financial context? In the abstract, we could assign a 'systemic impact factor' to each entity in the financial system that attempts to gauge the extent of the spillover effects. For instance, the systemic impact factor could be calculated through the type of fixed point calculation that is used in journal citations ratings or for calculating impact weights that Google uses for ranking websites. The impact weights for journals are such that a high-impact journal receives many citations from other high-impact journals. Similarly, the rankings of websites have the feature that a high-ranking website has links that point to it from other high-ranking websites.

In the financial context, a high-impact bank is one that imposes costs on other high-impact banks (Morris and Shin 2008).

Proposals in the Geneva Report

In practice, however, the rules governing financial regulation will need to be based on indicators that are more directly measured. The task is to find proxies for the underlying externalities that can reliably serve as the informational basis for regulation.

This year's Geneva Report on the World Economy (Brunnermeier et al. 2009) argues for a fundamental reappraisal of the basis for financial regulation and sets out a proposal on how the existing Basel II regulations should be modified to incorporate macroprudential goals – in particular, how the existing Basel II capital requirements ought to be modified

by the multiplication by a systemic impact coefficient that depends on indicators of potential spillovers.

Macroprudential indicators

Our list of indicators includes recent trends in leverage, asset growth, and the maturity mismatch between assets and liabilities. Each of these elements capture (albeit imperfectly) aspects of the externalities that one institution imposes on the system. At the same time, our goal is to preserve as much as possible that is good about the microprudential rationale for financial regulation. Our hope is that familiarity of the starting point (the existing Basel II framework) will make the task of re-orienting the regulatory framework appear less daunting and less wrenching in terms of implementation. But the underlying rationale for our proposals could not be more different from the Basel II rules themselves.

The Basel II process illustrates how changes in regulation are typically achieved incrementally. Even such measures as may have seemed to involve a discrete jump in the regulatory process, such as the passage of the original 1988 Basel I Accord turn out, on closer inspection, to have been largely an attempt to agree on, and to harmonise, pre-existing 'best practices' in the key nation states, without much overt attempt to rationalise them against fundamental principles, or underlying theory. Incremental change has the strength that it builds on accumulated wisdom. But it is possible for such an incremental, and generally reactive, process to migrate over time in wrong, or just inferior, directions. It is only with wrenching economic crises, such as the Great Depression, that there is a general willingness to review the fundamental tenets of the regulatory framework. With the global financial crisis that began in 2007, we may be experiencing another comparable shift in the collective willingness to review the foundations of regulation.

All this was known but ignored

In 2001, Jon Danielsson, Charles Goodhart, and I, together with other colleagues at the Financial Markets Group of the LSE, submitted a paper to the Basel Committee in response to a call for comments on the initial Basel II proposals. The three key planks in our argument were summarised in the executive summary in the following terms.

> *"The proposed regulations fail to consider the fact that risk is endogenous. Value-at-Risk can destabilise and induce crashes when they would not otherwise occur.*
>
> *Heavy reliance on credit rating agencies for the standard approach to credit risk is misguided as they have been shown to provide conflicting and inconsistent forecasts of individual clients' creditworthiness. They are unregulated and the quality of their risk estimates is largely unobservable.*
>
> *Financial regulation is inherent procyclical. Our view is that this set of proposals will, overall, exacerbate this tendency significantly. In so far as the purpose of financial regulation is to reduce the likelihood of systemic crisis, these proposals will actually tend to negate, not promote this useful purpose." (Danielsson et al. 2001)*

Eight years later, these conclusions still have resonance.

Banquo's ghost at the banquet

Back in 2001, our proposals must have been as welcome as Banquo's ghost at Macbeth's banquet. No one likes to be told that their carefully crafted work is flawed.

The Global Financial Crisis of 2007-08 has changed everything. The proposals of the Geneva Report are aimed at achieving a more stable financial system that works more effectively in serving the workings of the real economy to promote economic prosperity. We should seize this opportunity to put financial regulation on more secure conceptual foundations.

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1.3 The macroprudential approach to regulation and supervision

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14 April 2009

There is now a growing consensus among policymakers and academics that a key element to improve safeguards against financial instability is strengthening the 'macroprudential' orientation of regulatory and supervisory frameworks. This chapter explains the approach and various issues that regulators must address to implement it.

There is now a growing consensus among policymakers and academics that a key element to improve safeguards against financial instability is strengthening the 'macroprudential' orientation of regulatory and supervisory frameworks. Paraphrasing Milton Friedman, one could even say that "we are all macroprudentialists now". And yet, a decade ago, the term was hardly used.

An old idea whose time has come

In fact, the term is not new. At the Bank for International Settlements (BIS), its usage goes back to at least the late 1970s to denote a systemic or system-wide orientation of regulatory and supervisory frameworks and their link to the macroeconomy. It was already recognised then that focusing exclusively on the financial strength of individual institutions could miss an important dimension of the task of securing financial stability.

The term's appearance in public documents is of more recent vintage (e.g. BIS 1986). And it was not until the beginning of the new century that efforts were made

to define it more precisely, so as to derive specific implications for the architecture of prudential arrangements. This was first done in a speech by the then-BIS General Manager (Crockett 2000) and elaborated in subsequent research (e.g. Borio 2003). In those days, the usage of the term was already becoming more common (e.g. IMF 2000). Subsequently, the macroprudential perspective slowly gained further ground, as described in Knight (2006), White (2006), and BIS (2008), until the current financial crisis gave it an extraordinary boost.

What does it mean?

At the same time, the usage of the term remains ambiguous. What does 'macroprudential' really mean? What are its implications for policy? Drawing on the long BIS tradition, this column provides a specific characterisation of the macroprudential approach and highlights some policy implications. In the process, it brings together strands of analysis that may appear as unrelated.

The macroprudential approach has two distinguishing features. It focuses on the financial system as a whole, with the objective of limiting the macroeconomic costs of episodes of financial distress. And it treats aggregate risk as dependent on the collective behaviour of financial institutions (in economic jargon, as partly 'endogenous'). This contrasts sharply with how individual agents treat it. They regard asset prices, market/credit conditions and economic activity as independent of their decisions, since, taken individually, they are typically too small to affect them.

In turn, the macroprudential approach is best thought of as consisting of two dimensions.

- How risk is distributed in the financial system at a given point in time – the 'cross-sectional dimension'.
- How aggregate risk evolves over time – the 'time dimension'.

The key issue in the cross-sectional dimension is how to deal with common (correlated) exposures across financial institutions. These arise either because institutions are directly

exposed to the same or similar asset classes or because of indirect exposures associated with linkages among them (e.g. counterparty relationships). Common exposures are critical because they explain why institutions can fail together. Just as an asset manager, who cares about the loss on her portfolio as a whole, focuses on the co-movement of the portfolio's securities, so a macroprudential regulator would focus on the joint failure of institutions, which determines the loss for the financial system as a whole. The main policy question is how to design the prudential framework to limit the risk of losses on a significant portion of the overall financial system and hence its 'tail risk'.

The key issue in the time dimension is how system-wide risk can be amplified by interactions within the financial system as well as between the financial system and the real economy. This is what pro-cyclicality is all about (e.g. Crockett 2000; Borio et al. 2001; BIS 2001; Brunnermeier et al. 2009). Feedback effects – the endogenous nature of aggregate risk – are of the essence. During expansions, declining risk perceptions, rising risk tolerance, weakening financing constraints, rising leverage, higher market liquidity, booming asset prices, and growing expenditures mutually reinforce each other, potentially leading to the overextension of balance sheets. The reverse process operates more rapidly, as financial strains emerge, amplifying financial distress. As a result, actions that are rational and compelling for individual economic agents may result in undesirable aggregate outcomes, destabilising the whole system. The main policy question is how to dampen the inherent pro-cyclicality of the financial system.

Monitoring

A macroprudential approach has implications for the monitoring of threats to financial stability and for the calibration of prudential tools.

Monitoring should not consider institutions on a stand-alone basis or be limited to peer-group analysis. Rather, it should pay special attention to the sources of non-diversifiable, or 'systematic', risk in the financial system. Hence the importance of common exposures across institutions and of possible symptoms of generalised overextension in balance

sheets during economic expansions and macro risks. Notable examples are unusually rapid increases in credit and asset prices and unusually low risk premia. The build-up to the current crisis has hammered home the importance of all of these factors.

In the cross-sectional dimension, the guiding principle for the calibration of prudential tools is to tailor them to the individual institutions' contribution to system-wide risk. Ideally, this would be done in a top-down way. One would start from a measure of system-wide tail risk, calculate the contribution of each institution to it and then adjust the tools (capital requirements, insurance premia, etc.) accordingly. This would imply having tighter standards for institutions whose contribution is larger, contrasting sharply with the microprudential approach, which would have common standards for all regulated institutions. In turn, that contribution will depend on features that are either specific to the institution itself (e.g. its size and probability of failure) or relevant for the system as a whole (its direct and indirect common exposures with other institutions).

In the time dimension, the guiding principle is to calibrate policy tools so as to encourage the build-up of buffers in good times so that they can be drawn down as strains materialise. By allowing the system to absorb the shock better, this would help to limit the costs of incipient financial distress. Moreover, the build-up of the buffers, to the extent that it acted as a kind of dragging anchor or 'soft' speed limit, could also help to restrain the build-up of risk-taking during the expansion phase. As a result, it would also limit the risk of financial distress in the first place.

The gathering consensus

The growing consensus on the need to strengthen the macroprudential approach is easily apparent in both policy and academic communities (e.g. Mayes et al. 2009; Brunnermeier et al. 2009). The importance of monitoring threats to financial stability on a system-wide basis has been recognised for some time. Hence the proliferation of central bank financial stability reports and the efforts made to develop tools such as early warning indicators and macro stress-tests (e.g. Borio and Drehmann 2008,

2009). More recently, the cross-sectional dimension of the macroprudential approach has attracted considerable attention. Academic work has been seeking to estimate the contribution to system-wide risk of individual institutions (e.g. Acharya and Richardson 2009) and there have been calls for policymakers to extend official oversight to all financial institutions that are 'systemic', regardless of their legal form (e.g. De Larosière et al. 2009; G20 2009). Above all, however, it is the time dimension that has been in the limelight. Dampening the pro-cyclicality of the financial system is now widely regarded as a priority (e.g. Brunnermeier et al. 2009; Calomiris 2009; Mayes et al. 2009; De Larosière et al. 2009; G20 2009; FSF 2009). Several work streams under the aegis of the Financial Stability Forum are examining how this might be done. The BIS is actively working in all of these areas.

Future challenges

Looking ahead, the challenges involved in implementing a macroprudential approach to regulation and supervision should not be underestimated (Borio and Drehmann 2008). Some of these are analytical. Measuring system-wide risks and calibrating policy tools are both far from straightforward. For example, what size of capital buffers are needed so that they can be credibly run down without markets insisting on much higher ones at times of potential stress? And how far can their build-up and release be based on rules rather than discretion? Other challenges are of a more institutional and political economy nature. For instance, it is essential to align authorities' objectives with control over instruments and the know-how to use them. This means that careful thought should be given to mandates, to the composition of the bodies in charge of implementing the approach, and to the necessary insulation from political pressures, which might inhibit attempts to "take away the punch bowl as the party gets going". Whatever the specifics, this is bound to call for closer cooperation between supervisory authorities and central banks.

Editors' note: The views expressed are those of the author and do not necessarily reflect those of the BIS.

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1.4 Complexity kills

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29 September 2009

Complex financial models and intricate assets structures meant extraordinary profits before the crisis. Markets for structured products became overly inflated as even the banks did not have a clear view of the state of their investments. Given complexity's role in today's mess, future regulation should focus on variables that are easy to measure and hard to manipulate, such as leverage ratios.

Uncertainty about asset values is a key factor in the wave of financial institution failures we have been experiencing. It used to be that banks became insolvent because their loans went sour. Now it is the complexity of assets that lets them down. It may well be that the Lehmans of this world would have been able to cover their liabilities in the long run, but their downfall was triggered by a lack of liquidity because they were unable to demonstrate to the market that their assets were sound.

At first, complexity was a virtue

Before the crisis, sophisticated financial models and intricate assets structures enabled many banks to reap extraordinary profits, by enabling them to identify profit opportunities and risks in enormous detail. Complexity became a virtue. However, this complexity often meant that banks did not have a clear view of the state of their investments. Indeed, the greatest profit opportunities often lie at the edge of chaos. Unfortunately, at that point it takes little to send you over the edge.

In such complex financial models, mathematics often assumes far greater importance than the accurate depiction of reality. The models generally ignored liquidity as well as the fact that in a downturn assets that were previously well diversified move together, sharply increasing their correlation. The subprime industry only started after the previous recession, and the models therefore did not consider the possibility of economic downturns.

Consequently, valuations and risk assessments of structured products became increasingly out of sync with economic fundamentals and the underlying assets. Unfortunately, few mechanisms existed for identifying the looming problems. If the models indicate everything is fine, backed up by mark to market accounting practices, it is not surprising that the markets for structured products became overly inflated.

A sense of invulnerability: Mark to market, model or magic

A sense of invulnerability, or hubris developed within the financial system. "It is hard for us, without being flippant, to even see a scenario within any kind of realm of reason that would see us losing one dollar in any of those transactions" said Joseph J. Cassano, the former AIG executive, who was in charge of the AIG CDS operation that ultimately led to its failure in August 2007. See Khandani and Lo (2007) and Danielsson (2008) for more on these issues.

Eventually, in August 2007 the bubble burst. At the beginning of the crisis banks comforted themselves with the belief that that the crisis in the credit markets was a temporary phenomenon. After all, from a mark-to-market point of view the assets retained their values. What they did not realise was that it was the models themselves were wrong. Mark to market in the absence of a liquid market implies mark to model, or simply mark to magic.

Without liquidity, complexity became a vice

When credit markets collapsed and liquidity disappeared, complexity became a vice. In a crisis, banks gain access to liquidity by being able to demonstrate that they are solvent. If assets are so complicated that nobody, not the regulators, not the clients and not even the banks are unable to get any realistic assessment of valuations and risk, of course investors will refuse to supply liquidity. Banks simply became too sophisticated for their own good.

Given the role model complexity played in fuelling the crisis, the reaction of banking regulators has been on occasion incomprehensible. The regulators have allowed, and on occasion encouraged, the use of sophisticated models by banks, and they have gauged the health of the financial system with the output of these models. This approach is an important component of both the Basel II Accord for banks and Solvency II for insurance companies.

Before the current crisis there was some logic to this process. But given the role of model-driven complexity in the crisis, regulators should now be focusing on alternatives. An implementation of the leverage ratio as a means to determine minimum capital would be a good step forward. Unfortunately, while the leverage ratio is in use in the US and being advocated by Switzerland, the rest of the world's regulators have so far rejected it.

It is the nature of financial regulations that they tend to be reactions to previous crisis episodes and slow to adapt to the dynamic nature of the financial system. Existing regulations and the Basel II Accord address the problems of the financial system circa 1995. Hopefully, this crisis will lead to both banks and regulators to develop a healthy scepticism for the complex models that helped to get us into this crisis. Regulations should focus on variables that are easy to measure and hard to manipulate, such as the leverage ratio, and encourage transparency and simplicity in a bank's operations.

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1.5 The risks of trading by banks

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08 October 2012

Liikanen, Vickers, and Volcker all question current banking-trading links. This chapter offers analytic scaffolding for thinking about the separation of banking and trading. Banking generates low risk returns from relationship-based activities; trading generates high-risk returns from short-term concentrated positions. The two are linked since trading allows banks to profit from the 'spare' banking capital, but deeper financial markets magnify problems of managing and regulating trading by banks.

Trading by banks was a major factor in the recent crisis. Market-based activities – trading in, or holding securitised debt instruments – led to the failures of major universal banks in Europe (RBS and UBS among the largest) and of both investment and commercial banks in the US (Bear Stearns, Lehman Brothers, Merrill Lynch, Washington Mutual, Wachovia).

Since the crisis, trading remains a major source of instability. It caused repeated losses in banks (including $6.8 billion in JP Morgan in 2012). And commentators argue that trading is a drain on resources in universal banks, such as Bank of America-Merrill Lynch (which moved risky trading exposures to the commercial bank unit). Emerging empirical evidence (Brunnermeier et al. 2012) confirms the significant risks of trading by banks.

Trading can destabilise banks: Our conclusions

Do the recent trading-related bank failures represent one-off phenomena (maybe related to the crisis), or are they a sign of deeper structural problems in the financial system? An answer to this question would determine the optimal policy response.

Our recent paper (Boot and Ratnovski 2012) suggests that it is the latter. We argue that the deepening of financial markets in the last 10 to 15 years has fundamentally destabilised banks by inducing trading. Specifically, banks have incentives to use their franchise value to trade on a large scale. This gives rise to two key negative effects:

1. **Banks trade too much**. Points at a misallocation of capital, in part at the expense of lending. This is detrimental for real economic activity.
2. **Bank trading is too risky**. This is intrinsically linked to point (a): large trading positions encourage risk-shifting. This leads to failures and financial instability.

These (reinforcing) negative effects were not present historically when financial markets were not as deep, but will remain so in the foreseeable future. Without policy action, crises associated with trading by banks are bound to recur. Even strong supervision will not be able to prevent them. Consequently, it appears necessary to restrict trading by banks.

Towards a comprehensive policy response

Given the implications for systemic risk, trading by banks has received significant regulatory attention. Most noteworthy initiatives are the Volcker Rule in the Dodd-Frank Act in the US, the recommendations of the Independent Commission on Banking (the so-called Vickers report) in the UK, and the recent Liikanen report to the European Commission.

Despite these initiatives, the policy response appears slow and inconclusive. Implementation details are not yet worked out; compliance timelines, if at all present,

are very long. Also, while the problem is common to many countries, there is a large international heterogeneity in response, which can compromise the effectiveness of national measures.

The lack of a comprehensive policy response is in part surprising. Some can be attributed to lobbying and legislative frictions. But there is also a deeper, conceptual problem. Economists and policymakers lack a good understanding of the economic forces at play. This makes it very difficult to formulate an unambiguously effective, let alone optimal, policy.

In Boot and Ratnovski 2012, we attempt to fill this gap. We study the economics of trading by banks, and particularly the interaction between banks' trading and relationship-based activities, and highlight some key market failures. The analysis allows unique insights into the optimal structural policy in banking.

The analysis

There are three fundamental questions. First, why do banks engage in trading? Second, what are the possible market failures? Third, why has trading by banks become such a significant problem recently?

Traditional banking is a long-term relationship-based business, focused on repeated interactions with customers. Trading by banks can be defined broadly as any short-term (not based on repeated interactions) activities. Thus, fundamentally, trading includes not only taking positions for a bank's own account (proprietary trading), but also, for example, originating, selling, or holding standardised loans.

The key to our analysis is the observation that the traditional banking business is usually profitable, yet not readily scalable. The trading activity, on the other hand, is often capital constrained so can benefit from the capital of the bank, and is scalable. Accordingly, banks can expand into trading in order to use their 'spare' capital. This

synergy is akin to the assertions of practitioners that one can 'take advantage of the balance sheet of a bank'.

Opening up banks to trading, however, creates frictions (market failures). One such friction is the misallocation of capital. Banks may opportunistically shift too many resources to trading in a way that undermines their relationship franchise. This happens, for example, when banks chase short-term opportunities in financial markets and end up using the risk bearing capacity necessary for their core business. Another friction is risk-shifting: banks may use trading to boost risk to benefit shareholders. *As a result, banks trade too much, and in a too risky a fashion, compared to what is socially optimal.*

Importantly, trading by banks becomes more distortionary in deeper financial markets, which allow larger trading positions (increasing the misallocation of capital and enabling larger-scale gambles). Trading also becomes more distortionary when returns in the traditional relationship-based banking business are lower.

Implications: The dynamics of trading in banks

The simple observations above offer a very fundamental implication. In the last 10 to 15 years, financial markets have deepened substantially and traditional banking has become less profitable. The two trends had the same driver: information technology has increased the availability of hard information, expanding the universe of tradable claims and making banking more contestable. This means that while trading in banks was benign and contained before, it has irreversibly become more distortionary now.

To put it in starker terms: because of financial development, the business model where a bank combines core relationship operations with a transactional activity – be it in traditional European universal banks, in commercial banks that hold securitised products, or in investment banks – is no longer sustainable.

Trading in modern banks opens the door to risk-shifting and hence will lead to bank failures. Trading also leads to a misallocation of resources from lending; this makes

banks unable to maintain relationships and leads to a reduced supply of customer-oriented services, such as SME lending. Trading then also compromises the role of banks as providers of liquidity during economic slowdowns (Kashyap at al. 2002).

Policy design

Knowing the market failures – the misallocation of resources to trading and the potential for risk shifting – helps inform policy design. Specifically, we suggest the following:

- **Which activities to restrict?** The study suggests that risks are posed by transaction-based activities of banks. This offers two implications.

(a) Restrictions may need to cover more than proprietary trading (i.e. be wider than the core part of the Volcker rule). Other transactional activities, such as buying and holding securitised debt, pose similar threats (cf. Washington Mutual) and may need to be restricted.

(b) There is little justification for restricting customer-oriented investment banking activities, such as underwriting (so the restrictions can be narrower than the Vickers proposals). In fact, ample empirical evidence points to synergies between lending and underwriting.

- **Segregate or prohibit?** Segregation (as proposed by Vickers) can discourage overly risky trading, and is a necessary first step. But the study suggests that, even then, banks may still be able to allocate too much capital to their trading subsidiaries, leaving lending constrained. So it is important to protect capital and risk bearing capacity of bank lending operations. For this, trading within bank groups may have to be limited or prohibited altogether (as suggested by Volcker).
- **What about hedging?** The study suggests that trading at low scale does not create negative effects. At low scale, there is little misallocation of capital, and it is impossible to use small trading positions for risk-shifting. Hence the approach of

allowing a limited (and sufficiently small) percentage of bank capital to be put to trading risk (as in the Liikanen report) might be appropriate.

- **Can trading move to the shadow and become even riskier?** Our analysis suggests that this is unlikely. Trading by banks is particularly risky because available implicit bank capital (i.e. rents coming from activities other than trading) enables and induces trading at large scale. If trading is removed from banks, it will resemble that in hedge funds – at smaller scale and with lower threats to financial stability.
- **What about capital regulation and cyclicality?** The study suggests that restricting trading by banks will free up capital and mitigate the pro-cyclical effects of capital regulation. So restrictions on trading are complimentary to the Basel III initiatives. Also, trading by banks, when not fully restricted, can be charged punitive capital to discourage it, or at the very least, have it internalise its risk.

Editors' note: The views expressed in this chapter are those of the authors and should not be attributed to the IMF, its Executive Board, or its management.

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1.6 Investment banking

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13 October 2011

As protestors occupy Wall Street and financial centres around the world, among the grievances are 'socially useless' investment banks. This column argues, however, that investment banking is critical to any effective economy – the idea that policymakers can safeguard retail banking alone is not only tragically mistaken but also horribly dangerous.

Investment banking has attracted much vilification in recent years, being frequently described as "socially useless", or a "casino". Yet if its functions are not properly appreciated, the 'reforms' that are now being proposed could lead to further problems down the road ahead.[1]

The historical roots of universal banking

Universal banking came into being on the continent of Europe in the late 19th century and in Japan in the early 20th century in order to connect banking with large-scale industry (steel, chemicals, pharmaceutical, electrical, cars, etc.). With weak capital markets then, there was a need to channel retail savings into large-scale industry in order to promote industrialisation and growth.

1 See also the latest Vox eBook *The Future of Banking* (Beck 2011).

The *haus-bank* in Germany and *Zaibatsu* in Japan had close links with a stable of associated firms at the advisory, managerial, and equity ownership levels, as well as in the provision of loan finance. The contrast with the Anglo-Saxon tradition of 'arms-length' banking, with no close involvement with associated firms, and bank lending supposed to be for temporary purposes, was often noted, frequently on the back of accusations that the British (retail-type) banks were not doing enough to support industrial development.

The other main root of investment banking was merchant banking. The growth of international trade, and the globalisation of supply chains, again largely carried out by large firms, rather than small and medium-sized enterprises (SMEs), led to a concomitant need for the provision of trade finance; and with that to a need for the development of an international information network on financial, especially foreign exchange, commercial, industrial, legal, and political conditions in all the major countries involved. While bits of such information could be provided by specialist boutiques, there were obvious advantages of scale and scope in having large information networks in large financial institutions.

Banking in a world with sophisticated financial markets

The (often implicit) argument is made that such roles, in supporting large industry and international trade, have been superseded by the growth of efficient capital markets. These allow (big) industry, and other big borrowers, often in the public sector (eg subsidiary governmental bodies as well as sovereigns) to finance themselves directly, allowing banks to concentrate on lending to households and SMEs. Similarly trade finance can rely on efficient markets for foreign exchange, and various hedging derivatives. This judgement would be wrong (if made). The informational requirements needed to navigate oneself around the complexities of the current financial scene, especially international, are vast, and most corporations, local governments, large charities, and even central governments know that they do not have that ability.

On the other (buy) side of financial intermediation, most household savings are now channelled through institutional investors, pension funds, and insurance companies. Many people probably think that these institutional investors do all their investment analysis in-house, simply sending instructions to complete deals (at the best available price) to whichever broker offers the best immediate price. The reality is different. Most institutional investors have close relationships with one or more investment banks that provide analytical, financial, administrative, and deal-execution support. Besides their contact with (real money) institutional investors, investment banks provide a crucial link between all the major buy-side institutions and the financial/capital markets.

Thus the investment banks provide the key intermediation role both for the big sell-side borrowers and big buy-side borrowers. Much of this can be, and is, done without the need to use such banks' own balance sheets – e.g. analytical advice on mergers and acquisitions – but much requires the need for at least temporary use of the balance sheet. Clients often want assured access to finance, and so investment banks have to be able to make markets without necessarily knowing in advance to whom and at what price they can offload such positions.

Investment banks as intermediaries between big borrowers and big lenders

So, investment banks are the main intermediaries between large-scale borrowers and lenders and, as such, provide essential services in keeping wholesale capital markets functioning efficiently. Sometimes they even run such markets themselves, (e.g. dark-pools); more often they provide the channel through which almost all orders get transmitted to the market (e.g. derivatives markets). Such intermediation services are essential to the continued functioning of our complex modern economy. The chaos that occurred after the failure of Lehman Brothers, an investment bank without any retail banking involvement, is testimony to that. The idea that investment banks can be liquidated with far less social costs than 'pure' retail banks is incorrect, though alas common.

The temptation of knowledge

Investment banks, therefore, lie at the centre of informational and market networks, with 'inside' information of the positions and thinking of many of the big buyers and sellers. They have an informational advantage. There is an inevitable, indeed natural, tendency to exploit such informational advantage by taking positions for their own benefit, as well as – or instead of – for the benefit of the client. Moreover when such positions were 'wrong' for whatever reason, their size relative to the bank's own capital could often endanger, and in several cases has endangered, the continued viability of the bank.

There is no question but there have been failures in risk management in recent years in investment banking. There have been equivalent failures elsewhere, but it is evidence of the central importance of such banks that their failures figure so prominently on the front pages of newspapers.

It has been argued that risk management in the large investment banks has worsened because of size (top management cannot get a knowledgeable grip on everything) and incentives (the switch from a partnership to a limited liability governance mechanism). While there may be some validity in such criticisms, the informational economies of scope and scale make it hard to reverse past trends. The Volcker rules in the US attempt to ban position-taking by investment banks but, while many prop-desks have been shut down, it is difficult to distinguish pure position-taking from operations on behalf of clients or from day-to-day Treasury functions to finance the normal operations of a bank, even a pure retail bank.

Markets get made by participants taking positions. No one objects to agents taking positions if they bear the loss themselves. Problems arise when there are major externalities to society from such losses. It is the thesis of this note that the role of investment banks is so central to the efficient operation of our complex financial system that losses to such banks have major social externalities. The idea that, once you have

carved out the 'socially valuable' parts of retail banking, i.e. the payments system and retail lending and deposit-taking, you can liquidate the rest without massive adverse effects is not only tragically mistaken but also horribly dangerous.

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Part II

The role, calculation and levels of capital

2.1 The illusion of bank capital

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How much capital should banks hold to cover their risk? This chapter argues that the preoccupation with capital rules misses a more fundamental concern. No amount of feasible regulatory capital can be an appropriate substitute for robust asset selection and valuation standards of banks.

How much capital should banks hold to cover their risk? That question has been thrown back and forth among policymakers, bankers, and academics for years – and now, with the global crisis still lingering, the debate is more intense than ever.

The official sector – through the Basel Committee on Banking Supervision – have set the minimum Basel III capital adequacy ratio (CAR) at 10.5%, but have yet to reach an agreement on the magnitude of a proposed capital surcharge for so-called 'global, systemically important banks'. Bankers, on the other hand, have argued that an overly conservative minimum CAR is too costly and will negatively impact credit intermediation and jeopardise the economic recovery. Finally, prominent academics, led by Anat Admati of Stanford, have made a strong case to increase the minimum CAR to 15% (based on a non-risk weighted assets measure), arguing that the industry's concerns are nothing more than scare-mongering and that the new Basel III capital rules fall far short of what is needed to lessen both the likelihood or severity of future financial crises.

There is no doubt that strengthening both the quality and quantity of bank capital should make the global banking system better able to absorb, and provide more tangible

buffers to curb, excessive risk-taking at individual banks. Against this background, it is hard to argue against the need to maintain even higher than the minimum Basel III capital requirements, particularly for systemically important banks. Nevertheless, the current preoccupation with capital rules misses perhaps a more fundamental concern: that no amount of feasible regulatory capital can be an appropriate substitute for robust asset selection and valuation standards of banks, both of which are reliant on strong risk management (banks) and supervision (authorities).

Capital is a residual. It is the difference between the value of bank assets and liabilities. Because most bank liabilities – in general – are carried at cost, capital is heavily influenced by a bank's asset selection criteria (origination standards); and second, the reliability of ongoing asset valuations, particularly impairment on loans and securities not held for trading, and 'hard-to-value' assets carried in the trading book, where quoted market prices are not available. Herein lies the challenge. Both the quality of origination standards and price 'discovery' for a substantial portion of bank assets remains more art than science; and it is wholly reliant on the exercise of sound judgment – supported by critical analysis – by bank risk managers and bank supervisors. These qualitative factors cannot be appropriately addressed by simply increasing the minimum CAR.

The implications of poor asset selection standards and wrong valuation judgements are anything but inconsequential, as a small change in asset values can have a disproportionate impact on the reported CAR. Consider that a 5% drop in asset values approximates a 48% decline in the minimum Basel III capital requirement, if capital is measured as a percentage of total assets. Even an increase in the minimum CAR to 15% will not materially alter this relationship.

Given the clear linkages between the reliability of reported capital and the quality of risk management and supervision, key stakeholders should focus on the far more difficult challenge of 'how to' strengthen risk governance and supervision.

- As a starting point, policymakers may need to revisit how prudential rules that govern bank compensations systems, asset origination, risk management, and asset

valuation practices are written, so that these rules provide a better balance between explicit standards and broad principles, in order to introduce more 'constrained discretion' in day-to-day risk management and supervision.

- Second, authorities will need to refocus efforts in training its frontline supervisors, in order to ensure that they are equipped with the knowledge, skills, and abilities to serve as a formidable line of defence against excessive risk-taking at both individual banks and the banking system as a whole. For its part, bankers must ensure that its incentive structure does not promote excessive risk-taking and that it provides sufficient resources to, and elevates the stature, independence and authority of, the risk management function, so that they are willing and able to say "no" in response to a degradation of asset selection standards and imprudent asset valuation practices.
- Third, key market watchdogs – such as rating agencies, analysts, and institutional investors – must take a more nuanced approach to interpreting and evaluating the CAR, so that they can provide true meaning to the often used (but rarely effective) concept of market discipline.

The recent financial crisis is a humbling wake-up call. The capital adequacy ratio is meant to mitigate crises, but has on too many occasions served to mask the true health of numerous banking organisations and national banking systems. Without a better understanding of – and greater focus on – how risk management and supervision interact with bank capital, the new Basel III capital rules may prove to be nothing more than 'fool's gold'.

Editors' note: The views expressed are the author's own and should not be attributed to the IMF or Bank Indonesia.

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2.2 Bank capital requirements: Risk weights you cannot trust and the implications for Basel III

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Recent research shows that capital requirements are only loosely related to a market measure of bank portfolio risk. Changes introduced under Basel II meant that banks with the riskiest portfolios were particularly likely to hold insufficient capital. Banks that relied on government support during the crisis appeared to be well-capitalised beforehand, suggesting they engaged in capital arbitrage. Until the regulatory concept of risk better reflects actual risk, the proposed increases in risk-weighted capital requirements under Basel III will have little effect.

One of the primary purposes of bank capital is to absorb losses. Where bank capital holdings are insufficient to absorb losses, banks will either fail or – if bank failure is deemed too costly for the economy – be bailed out. In practice, banks frequently receive public funds where capital holdings are insufficient to cover losses in order to prevent bank failure. Whether or not bank capital holdings are sufficient and in line with the risk of bank portfolios is therefore an important question that is hotly debated among policymakers and in the press.

Capital adequacy and the financial crisis

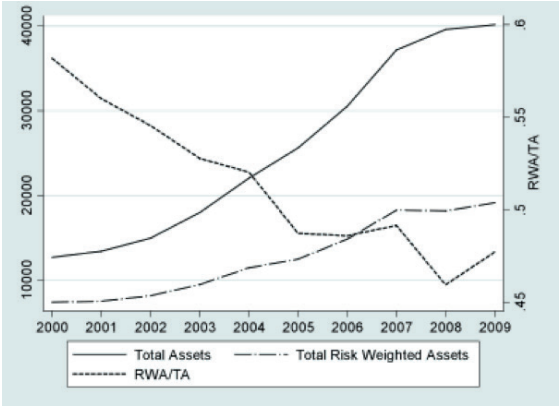
The financial crisis that started in 2007 illustrates that capital-adequacy rules have failed to ensure that banks' capital holdings are in line with the riskiness of their assets. This is true despite numerous refinements and revisions over the last two decades (Goldstein 2012). From the onset of the financial crisis, fears that banks hold insufficient capital have critically undermined the functioning of interbank markets. When banks are not subject to regulatory capital requirements commensurate with their portfolio risk, bank solvency is likely to be threatened by adverse shocks to the value of bank asset portfolios.

The Basel Accord of 1988 introduced minimum capital standards as a fixed proportion of the risk exposure of a bank, as measured by risk-weighted assets. In most countries, the minimum capital requirement is 8% of risk-weighted assets. Underlying Basel is the notion that the risk weights assigned to each asset class reflect the associated economic risks. Thus, a key question is whether this regulatory measure of bank portfolio risk is reflective of the true portfolio risk of a bank. If not, banks will try to game the system by investing in risky assets which maximise returns while reducing capital requirements. Some commentators have long argued that this is in fact the case.

The problem with the Basel risk-weighting system

Banks' ability to game the system is nicely illustrated by Figure 1. The graph shows the value of total assets, risk-weighted assets, and the proportion of risk-weighted assets to total assets of the world's largest 124 banks. The proportion of risk-weighted assets to total assets has been falling steadily since 2000. One way of interpreting this is that banks have become progressively less risky over time. A different interpretation is that banks have increasingly gamed the Basel rules, resulting in lower risk-weighted assets – and thus lower capital requirements – but probably no less risk.

Figure 1 The decline of risk-weighted assets to total assets



How risk sensitive are Basel capital requirements?

In a recent study (Vallascas and Hagendorff 2013), we analyse just how risk sensitive the Basel capital requirements for banks really are. We examine the risk sensitivity of capital requirements for an international sample of large banks between 2000 and 2010. We demonstrate that capital requirements are only loosely related to a market measure of the portfolio risk of banks. Owing to this weak risk calibration, even pronounced increases in portfolio risk generate almost negligible increases in capital requirements. To illustrate this, we show that when the market measure of portfolio risk increases nearly threefold (from 2.1% to 6.2%), the average bank in our sample faces additional capital requirements of 0.78 percentage points (assuming capital requirements of 8% of risk-weighted assets).

Modifications to the original Basel Accord (Basel II) were designed to enhance the sensitivity of capital requirements to bank portfolio risk via the introduction of more granular risk weights. Our study shows that, in many ways, Basel II has made things worse in terms of the risk-sensitivity of capital requirements. Under Basel II, banks display only a marginal improvement in the risk sensitivity of their capital requirements. Most importantly, however, the internal ratings-based approach under Basel II has

introduced asymmetric risk elasticities for low- and high-risk bank portfolios. While banks with low-risk portfolios reduce their capital requirements when adopting the internal ratings-based approach, banks with high-risk portfolios are not required to hold significantly more capital. This implies that banks with the riskiest asset portfolios are particularly at risk of holding insufficient capital under Basel II.

Overall, our results clearly show that the risk sensitivity of capital requirements is very weak and that this has undesirable consequences. First, we show the capital buffers that banks typically hold above regulatory requirements partly result from capital arbitrage. This means that banks with higher capital buffers report lower amounts of risk-weighted assets per unit of assets for a given level of portfolio risk. As a result, banks may be undercapitalised in spite of holding capital well above the minimum regulatory requirements. Second, we show that capital arbitrage diminishes banks' ability to withstand adverse shocks. We show that banks that increased their capital buffers markedly during 2008 and 2009 and did so relying at least in part on government support displayed a particularly low risk sensitivity of their capital requirements between 2000 and 2007.

The implications for Basel III

Our results raise doubts over whether the revisions to capital requirements which are in the processes of being implemented will be sufficient to ensure that banks hold capital in line with their portfolio risk. The Basel III revisions are designed to increase both the quantity and quality of minimum capital holdings by further enhancing the risk sensitivity of capital requirements. As regards increases in risk-weighted assets relative to Basel II, the Basel Committee (2011: 31) reports that "a 1.23 factor is a rough approximation based on the average increase in [risk-weighted assets] associated with the enhancements to risk coverage in Basel 3 relative to Basel 2". However, as long as the regulatory concept of risk exposure underlying the computation of risk-weighted assets remains only weakly related to risk, the proposed increases in capital requirements are

unlikely to align capital holdings with the effective riskiness of bank asset portfolios. The risk sensitivity of capital requirements we report is of such a low magnitude that we question whether Basel III will improve the relationship between capital requirements and risk in an economically meaningful way. The projected increase in risk-weighted assets under Basel III suggests that – even under a minimum capital ratio of 13% – banks in our sample will only be required to hold, on average, 1.94% of additional capital per unit of assets. Such an increase is unlikely to make minimum capital requirements more reflective of bank portfolio risk in an economically meaningful way.

Our findings support a much more profound overhaul of capital adequacy rules than currently proposed. In line with our findings, Admati and Hellwig (2013) call for an increase in capital requirements (based on unweighted assets) well into double-digit territory to improve the safety of the financial system. Naturally, concerns over bank lending means that the phasing-in of higher capital requirements will have to be carefully managed by policymakers (Calamoris 2013) and complemented by tight and efficient supervision that minimises banks' ability to game the system. However, it is equally clear that the risk-sensitivity of the Basel capital adequacy framework is inadequate, and attempts by Basel III to moderately improve the risk sensitivity of capital requirements will not be able to address this issue.

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2.3 Banking on the average: A new way to regulate banks

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07 September 2011

Current regulation imposes fixed capital requirements on banks. However, this makes it impossible to use regulatory capital as a buffer against negative macroeconomic shocks. This chapter explains how this paradox could be resolved by basing capital requirements each year on average bank equity capital in the industry.

There is ample evidence that banking crises are costly, and it seems that the current crisis may be the most costly ever. Accordingly, the fundamental options available for regulating the banking sector and preventing a future collapse of the system are a major focus of attention in both public and academic discussions.

Why regulate?

Any reform of capital regulation has to put its cards on the table. There are at least three rationales for imposing capital requirements (for a thorough analysis and discussion, see Hellwig 2008).

- Equity capital can act as a buffer against negative shocks, and hence against the risk of insolvency.
- Equity capital requirements can curb excessive risk-taking by bank managers.
- Capital requirements might be used to allow supervisory intervention before the onset of bankruptcy.

Unfortunately, standard capital regulation cannot serve all three purposes. In particular, the first rationale stands in contradiction to the imposition of strict capital requirements based on the second or third rationale. Strictly enforcing capital requirements in each period makes it impossible to use bank equity as a buffer and may even increase a bank's insolvency risk by forcing it to sell assets when a crisis causes market prices to fall significantly below the value they would have under normal market conditions. As pointed out by Hellwig (2008), the key question for capital regulation is how banks should adjust their assets and liabilities when losses have caused a decline in equity capital.

A proposal

To permit banks to use their equity as a buffer while at the same time allowing for supervisory intervention and limiting excessive risk-taking, I propose a new way of determining capital requirements. The suggestion involves the following rules:

- Capital requirements are determined at the beginning of the calendar year and they should depend on the actual level of aggregate bank equity in relation to aggregate assets, or equivalently, individual bank equity should be based on average equity in the banking industry. During the calendar year, bank equity can be used as a buffer for negative shocks.
- Bank equity rules are given as follows:[1] First, if average bank equity is relatively high, banks need high equity as well. Second, suppose that a negative macroeconomic shock or a steep decline in real estate prices has eaten into the equity of banks, so that average equity is low at the end of a calendar year. Then banks would be asked to recapitalise in the following year so as to build up their equity and have a new

1 A complete description of the rules is available upon request. The individual capital requirement for a given bank can be described as a function of the current average equity and of this bank's current equity.

buffer at their disposal. It will be left to the banks how they adjust their balance sheets in order to satisfy the new capital requirements.[2]

- A bank that is unable to recapitalise itself within a given time frame may face liquidation, or if such actions threaten the entire financial system, it will be recapitalised and restructured.
- The whole scheme may be complemented by upward and downward adjustments of capital requirements, depending on whether a particular bank holds a high-risk or low-risk portfolio.
- In addition, capital requirements for large international banks may be based on the average equity capital of such financial institutions.
- If the number of banks in a country is extremely small, the country may use an international average of bank equity capital in countries that are good matches.[3]

There are different institutional designs to implement this proposal. One possibility could be that national regulators execute the scheme, but there would be international coordination on rules on how banks need to recapitalise themselves in case bank equity has declined. Moreover, a separate regime for large, internationally active banks is needed.

A brief assessment

The scheme can fulfil the three purposes of capital requirements. First, as the standard rationale suggests, forcing banks to have sufficient equity within a particular time frame reduces excessive risk-taking. The scheme further curbs excessive risk-taking,

2 One might also consider using different time frames for different banks to stagger the adjustments of balance sheets of banks in such circumstances.

3 If a country with a very small number of banks applied the scheme using the national average, a bank's choices today would have a major impact on the average equity capital in the future and hence on the capital requirements of the bank under consideration. This could lead to more risk-taking.

as banks will face higher recapitalisation requirements the next year if they behave less prudently than other banks.

Second, the scheme allows banks to use their equity as a buffer against credit losses or market downturns in a particular calendar year, coupled with the need to increase equity in a specific time frame. To illustrate this, let us consider two scenarios. Suppose first that a bank is suffering losses during the calendar year, while other banks fare well. Then, the equity of the bank under consideration will be allowed to decline, but the bank faces requirements for a large recapitalisation in the following calendar year, as average bank equity is high. Second, suppose that all banks are hit by a similar negative shock, such as a decline of GDP growth, a sharp drop in real estate prices, or an interest rate hike. All banks face demands for increasing their equity in the next period, after having been allowed to live for a short time with a drop in their equity. However, as average bank equity has declined as well, recapitalisation requirements will be lower, as a large recapitalisation could trigger itself a systemic crisis when banks are forced to sell assets if they do not obtain enough fresh equity capital.

The scheme may have additional advantages. In particular, it may promote competition of banks to have a high level of equity, as no bank would like to be below average if such information is reported publicly. It is likely, however, that such reporting alone would not suffice to induce high bank equity levels. Furthermore, the proposed scheme will require international coordination in order to internalise positive and negative spillovers that would occur if countries independently decided on capital regulation and crisis management. However, the scheme may reinforce the positive effects of systems competition, as a country may want to have higher average bank equity than other countries.

Like any proposal to determine bank capital, it will require a careful fine-tuning with other branches of regulation of financial institutions, in particular with deposit insurance schemes, bankruptcy codes and competition laws. The current crisis has forcefully illustrated that governments will protect depositors in the case of a system-wide

collapse. Thus, it might be useful to combine the proposed equity capital regulation with an explicit deposit insurance scheme.

Finally, the principle of banking on the average could also be applied to other ways that have been proposed to reduce systemic risk, such as the leverage ratio. Of course, like other regulatory approaches, banking on average is no panacea, as systemic risks have no perfect remedy.

Conclusions

The crisis now upon us has highlighted the deficiencies of the current regulatory framework, so it is necessary to do some radical rethinking on how to regulate banks and other financial institutions. Using actual average bank equity capital to determine the regulatory capital of an individual bank is an avenue well worth exploring.

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2.4 How much capital should banks have?

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After much negotiation, Basel III regulations set capital requirements to be between 8% and 12%. This chapter suggests this may not be enough. It looks at how much capital banks would need to fully absorb asset shocks of the size seen in OECD countries over the last 50 years. The answer is 18% risk-weighted capital, corresponding to 9% leverage. This benchmark is highly conservative, so the true 'optimal' bank capital may be lower.

There is an active debate on how much capital banks should have. Yet establishing an 'optimal' level of bank capital is more art than science. Any conclusion is model-specific and contains a degree of judgement. The purpose of this chapter is to contribute to the debate by offering one more benchmark.

Basel III imposes on banks an equity-to-risk-weighted-assets ratio (risk-weighted capital) of between 8 and 12%. This is comprised of the 4.5% basic ratio, 2.5% conservation buffer, 2.5% countercyclical buffer (in upturns), and up to 2.5% surcharge on systemic banks. Some countries have higher capital requirements. Singapore imposes a 2% surcharge over Basel; the Vickers proposals in the UK call for a 3% surcharge; and Switzerland requires that its international banks hold an extra 6% capital, bringing total capital requirements to 18-19%.

Historically, banks held more capital than they do today. In the early 20th century the leverage (equity-to-total-assets) ratio for US and UK banks was around 8-12% (Miles 2011). To convert the leverage ratio into risk-weighted capital, the rule of thumb is to multiply it by two; the average risk weight is 0.5 (King 2010; La Lesle and Avramova 2012). So the 8-12% leverage could correspond today to 16-24% risk-weighted capital. However, that period is of limited guidance as banks were less diversified and did not have access to a well-developed safety net or deposit insurance. Leverage ratios for US and UK banks in 1950-70s were about 6.5%, corresponding to 13% risk-weighted capital. This is close to the Basel III targets.

It is hard to quantify precisely the recent, pre-crisis evolution of bank capital, because banks understated risk weights and held many exposures off-balance sheet. But a number of major global banks had leverage of only 3%, which under average risk weights would correspond to 6% risk-weighted capital. This is about a half of where they should be to satisfy Basel III.

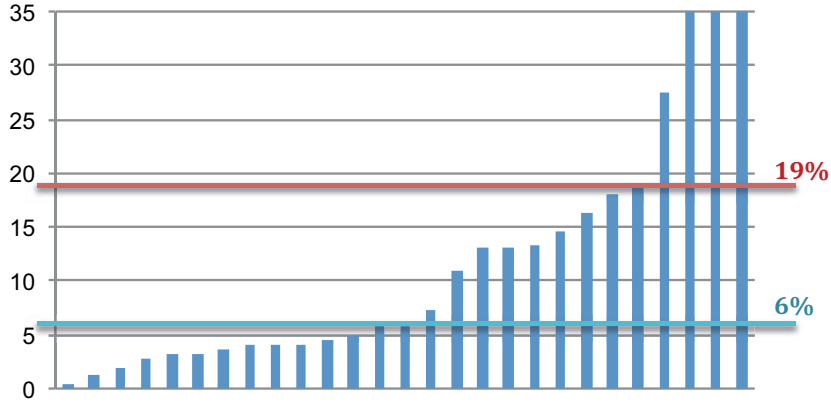
In the academic community, many argue that banks may need significantly more capital. In a 2010 letter to *Financial Times,* signatories suggested that "if a much larger fraction, at least 15%, of banks' total, non-risk-weighted, assets were funded by equity, the social benefits would be substantial." This target is high; 15% leverage corresponds to 30% risk-weighted capital.

An exercise based on losses in past crises suggests up to 18% capital

Figure 1 plots the distribution of non-performing loan ratios in banking crises in OECD countries, according to Laeven and Valencia (2012). In most events, ratios were modest; the median is 6%. Including more extreme events, to comprise 85% of episodes (24 out of 28), gives non-performing loans of up to 19%. Episodes with even higher non-performing loans represent extreme, twin (banking-currency) crises, i.e. Korea in 1997, Turkey in 2000, and Iceland in 2008. Twin crises are rare in advanced economies; their

risk can be reduced by controlling currency mismatches in banks and corporations. So we can take 19% as a historic upper bound for non-performing loan ratio in non-twin banking crises in advanced economies.

Figure 1 Non-performing loan ratio during banking crises in OECD countries



To obtain loan losses, the non-performing loan ratio should be adjusted for loss given default. There is little systematic data on loss given default. We use the estimate of Schuermann (2004) that the mean loss given default on senior secured debt in US over 1970-2003 was in the order of 50%. This means that a 19% non-performing loan ratio corresponds to 9.5% loan losses. Around 1% of that can typically be absorbed by earlier provisioning. (In Spain, dynamic provisioning was able to achieve buffers of 1.5%; Saurina 2008.) This leaves loan losses net of provisions of 8.5%.

Bank equity may need to be somewhat higher than 8.5% when system-wide average losses are asymmetrically distributed among banks (i.e. some banks realise higher losses), or because banks need extra capital to continue operating after absorbing the losses. But there is also a powerful argument why equity could be somewhat lower; equity reduces bank risk-taking incentives, so well-capitalised banks are less likely to engage in strategies that lead to severe banking crises in the first place.

On balance, with a margin of safety, one could suggest that a 9% equity-to-total-assets ratio (leverage), corresponding to an 18% equity-to-risk-weighted-assets ratio (risk-weighted capital), would offer banks enough capital to fully absorb most asset shocks of magnitudes observed in banking crises in OECD countries over the last 50 years.

We emphasise that this is a conservative estimate. For example, if one believes that higher bank capital has strong incentive effects, the appropriate capital target could be lower, say, 15%.

The estimate can be seen as good news. While conservative, it is not too far from the Basel III's highest 12% ratio. It is very close to the Swiss capital requirements. And it suggests that more extreme proposals – such as those of 30% risk-weighted capital – are overkill.

It is useful to note some caveats.

- As with any estimate, there is significant model uncertainly. Losses in past crises can be a poor predictor of future losses, as bank risks can increase or decrease due to financial innovation.
- The estimate is based on losses on loans, not on the rest of bank balance sheet. 'The rest' today comprises about 50% of assets of an average large bank, half in trading assets and securities and half in cash and interbank claims (King 2010). Trading securities can have larger losses, while cash and interbank claims be safer than loans during crises. One could refine the analysis to arrive at a more precise estimate of capital needs by modelling bank asset structure with associated crisis losses and risk weights in more detail.
- We base the estimate on data for OECD countries (relevant for advanced economies). Historic losses in banking crises in emerging and developing economies were larger, due to weaker resolution tools and legal environment.
- We assume that all absorption capacity has to be provided by bank capital – equity. In practice, some can be provided by contingent capital – a debt security that

contractually converts into equity well ahead of bank distress. Some recent policy initiatives focus on 'bail-inable' debt, which the government can haircut during crises (Zhou et al. 2012). But haircutting bank debt risks exacerbating a crisis, so it is unclear whether relying on the absorption capacity of bail-inable debt is optimal from an ex ante perspective.

- The estimate is a target for bank capital at the peak of the cycle. When the economy is slow or contracting, bank capital requirements could be lowered to facilitate lending and recovery.

Overall we hope that, notwithstanding these caveats, this simple calculation may provide a useful benchmark for thinking about optimal capital levels.

The costs of higher capital are modest in steady state, but adjustment is a challenge

If one uses the losses in past crises as a gauge for 'optimal' bank capital, what would be the cost associated with higher capital levels?

There are two ways to calculate the effect of higher capital on the bank's cost of funding. One is to keep the costs of bank's debt and equity exogenous. Assume that the required return on bank equity is 15%, and the cost of bank debt is 5% (3% net of tax shield). Then an increase in the bank's risk-weighted capital ratio by one percentage point, equivalent to a shift of 0.5% of funding from debt to equity (given the average risk weight of 0.5), would increase the weighted average cost of capital by six basis points. This type of analysis is used by Elliott (2009) and BCBS (2010); it produces the highest possible costs.

Another way is to base on the Modigliani-Miller proposition that the banks' overall cost of funding should not increase with higher equity (as equity and debt become safer and cheaper; Admati and Hellwig 2013), except for the tax shield effect. Then – under similar assumptions – an increase in the bank's risk-weighted capital ratio by one

percentage point would increase the weighted average cost of capital by just one basis point. Under additional departures from Modigliani-Miller, the cost can be somewhat higher: Kashyap et al (2010) suggest up to 2.25 basis points for a one-percentage-point increase in risk-weighted capital.

Thus, the costs of higher bank capital in steady state are modest. An increase in bank capital requirements by six percentage points from the Basel's 12% to our very conservative 18% would increase the banks' cost of funding (and hence the lending rates) by about 13.5 basis points under the Kashyap et al. (2010) estimate. And in the case where Modigliani-Miller does not hold (exogenous costs of debt and equity) the increase would be 36 basis points.

While the high level of bank equity is not prohibitively costly in steady state, the costs of raising bank capital quickly may be substantial. Issuing new equity has underwriting and adverse selection costs. Reducing dividends to boost retained earnings may lead to declines of bank capitalisation and weaken confidence. But the main risk is that banks can increase capital ratios by cutting lending. Aiyar et al. (2013) show that about a half of banks' short-term response to an increase in capital requirements occurs through a contraction of balance sheet. This means, for example, that an increase in capital requirements from 10% to 11% (by one percentage point, equivalent to 10%) could reduce lending associated with the highest risk weights (e.g. non-financial corporate lending) by as much as 5%. So the adjustment cost cannot be neglected.

This suggests that banks should increase their equity over a period of time, backloaded to the time when economic growth accelerates. For Europe, this may be another argument for the European Stability Mechanism support to banks in distressed countries (Dell'Arricia et al. 2013).

Author's note: The views expressed are those of the author and do not represent those of the IMF. I thank Charles Calomiris, Stijn Claessens, Luc Laeven, Srobona Mitra, and others for helpful comments. All errors are mine.

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2.5 Is a 25% bank equity requirement really a no-brainer?

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28 November 2013

There is widespread agreement that government protection of banks contributed to the financial crisis, leading to proposals to require banks to finance a larger share of their portfolios with equity instead of debt – thus forcing shareholders to absorb losses instead of taxpayers. This chapter argues that equity ratios relative to asset risk are what matter, not equity ratios per se. Although higher equity requirements for banks may be desirable, the costs of reduced loan supply should be taken into account.

Professor Allan Meltzer famously quipped that "capitalism without failure is like religion without sin". If some firms are protected from failure when they cannot pay their bills, then competition is skewed to favour inefficient, protected firms. Banks whose debts are guaranteed by the state receive an unfair advantage that enables them to allocate funds inefficiently, recklessly pursue risks at the expense of taxpayers, and waste resources that would be better used by firms operating without such protection.

The financial crisis of 2007–09 wasn't the first to illustrate that protected banking systems tend to blow up, imposing huge losses on taxpayers who are left to foot the bill. In the past three decades alone, there have been over a hundred major banking crises worldwide (Laeven and Valencia 2012). There is no topic in financial economics that has achieved a clearer consensus among researchers than the proposition that government protection of banks has contributed to the recent wave of costly bank failures around the world – failures on a scale that has never been witnessed before.

Anat Admati and Martin Hellwig's recent book, *The Bankers' New Clothes* (Admati and Hellwig 2013) proposes to force banks to maintain much more of their financing in the form of equity rather than debt, so that bank shareholders rather than taxpayers will bear most or all of the downside risk of bank losses. In their well-intentioned zeal to make the case for how beneficial, simple, and costless it would be to mandate dramatic increases in bank equity ratios, Admati and Hellwig overstate the benefits and understate the costs associated with this proposed reform.

Book equity ratios vs. true risk-weighted equity ratios

Admati and Hellwig assert that accomplishing a credible increase in the proportion of bank equity capital is a simple matter of increasing minimum regulatory requirements for the ratio of the book value of equity relative to assets. Would that it were so simple, but it is not; increasing the book equity ratio in an accounting sense does not necessarily increase true bank capital ratios, as I argue in my recent work (Calomiris 2013). Bank balance sheets do not capture many of the economic losses that banks may incur. Also, accounting practices can disguise the magnitude of loan losses, and regulators eager to avoid credit crunches are often complicit in doing so. The result is that banks' true equity ratios can be much lower than their book values indicate. Furthermore, banks' risk choices matter, not just their equity. Both the Basel approach to risk weighting of assets and the simpler approach the authors advocate (that would abandon all risk weighting in favour of a simple equity-to-assets requirement) have a common flaw – they encourage banks to pursue hidden increases in asset risk.

For all these reasons, increasing required book-equity ratios does not necessarily translate into reducing the risk of bank failure. That does not mean that equity ratios are irrelevant; only that requiring increased book equity does not, by itself, result in higher true equity. Nor, and more importantly, do higher equity requirements ensure that banks will have higher equity relative to their risk, which is the essential goal of the regulatory reform that Admati and Hellwig envision.

Admati and Hellwig also argue that raising the ratio of equity finance in the structure of bank liabilities has few if any social costs. They dismiss the possibility that higher equity requirements for banks might be socially costly as a "bugbear…as insubstantial as the emperor's new clothes in Andersen's tale." The authors go on to say, "[f]or society, there are in fact significant benefits and essentially no cost from much higher equity requirements." Such a policy would resolve the "fundamental conflict between what is good for banks and what is good for the broader economy."

Cost of equity vs. risk-adjusted returns

These statements fail to represent the findings of decades of research encompassing scores of theoretical and empirical contributions in the banking and corporate finance literature. The key academic sleight-of-hand made by the authors, which is the basis for these statements, is to focus attention solely on the risk-adjusted *returns* expected by investors when discussing the risk-adjusted costs to banks of their capital structure choices. Admati and Hellwig incorrectly equate the two. "The cost of equity," the authors claim, "essentially corresponds to the returns that corporations must provide to shareholders to justify the money it has received from them." But for the banks that issue that equity, there are almost certain to be other important costs (and benefits) associated with capital structure choices that are only indirectly related to the returns expected and received by investors. And for this reason, the costs to a bank of issuing equity and the expected return received by equity investors who buy the new offering are not generally the same.

Differences between investors' expected returns and firms' financing costs have been shown to imply that, in general, there will be an optimal combination of debt and equity for each bank (or any other firm), which reflects a variety of considerations. One class of models focuses on the effect of the deductibility of interest payments on the optimal combination of debt and equity – firms balance the tax advantage of debt against the value preserved by holding more equity and thereby limiting the risk of

financial distress. Another class of 'signalling' models considers how equity issuance can have adverse effects on market perceptions of firms' investment opportunities, and lead issuers to avoid equity offerings more than they otherwise would. In still another class of models, choosing the right combination of debt and equity leads to efficient transfers of control to creditors under certain states of the world, which also encourages portfolio diversification and truthful revelation of investment outcomes, which reduce funding costs. In a fourth class of models, the right combination of equity and debt can provide incentives to manage risk more efficiently, which also reduces funding cost. Finally, in the context of banking, issuing very low-risk, short-term debt instruments in combination with sufficient equity can provide non-pecuniary liquidity benefits to the holders of the debt (especially depositors), which increases demand for the debt and allows bankers to save on funding costs.

Costs of higher bank equity requirements

Admati and Hellwig's discussion of bank funding costs and capital structure recognises only two benefits of debt finance: the tax deductibility of interest, and the safety-net distortions stemming from government guarantees that effectively reduce banks' costs of subordinated debt as well as deposits. They argue that eliminating these advantages of debt finance is desirable. That claim neglects substantial empirical evidence consistent with other influences, such as signalling models. But even if tax favoured treatment of debt and safety net subsidies were the only factors favouring debt finance, and even if one could argue from a social cost-benefit analysis that it would be desirable to eliminate both safety-net subsidies and the tax deductibility of interest, it does not follow that doing so is costless.

An important implication of the various models of optimal capital structure is that forcing banks to raise their equity-to-asset ratio requirement generally will reduce banks' willingness to lend. A large number of studies have shown that, when banks need to raise their equity-to-asset ratios, they often choose to do so by cutting back

on new loans, which avoids the need to raise new equity and the high costs associated with it. For example, one recent study of the loan supply response to increases in required equity ratios in the UK reports that a one percentage point increase in required equity ratios reduces the supply of lending to domestic nonfinancial firms by about 7% (implying an elasticity of loan supply of roughly negative 0.7).

The reduction in loan supply that comes from raising equity ratios is not just a one-time cost. A higher required equity ratio will mean that, as the banking system grows, a larger percentage of bank equity will have to be raised externally rather than through the retention of earnings. Because it is costly to raise outside equity (in large part because of the signalling and agency costs mentioned earlier), banks will face permanently higher funding costs, which in turn will permanently reduce the supply of lending relative to a world with lower equity ratio requirements.

Finding the right bank equity requirement

The existence of social costs associated with higher equity requirements does not rule out the desirability of a substantial increase in equity requirements. Indeed, most economists (including me) would be willing to accept some reduction in the supply of credit in return for the benefits of achieving greater financial stability, particularly given the current low equity ratios that banks maintain.

What is the right equity ratio to target, and what is the basis for the 25% equity-to-asset ratio proposed by Admati and Hellwig? After all, if they really believed their argument that raising the equity ratio can never have a cost, then why not advocate a 100% equity ratio?

The main basis for Admati and Hellwig's recommendation of a 25% ratio is their view that historical experience shows that, prior to safety net protection, banks maintained that level of equity ratios. But Admati and Hellwig are too glib when making these historical comparisons, and they fail to note some important differences between banks

then and now. Bank equity ratios, both in the US and abroad, have varied markedly in the past, and were not generally as high as 25% of assets. Some of the most stable banking systems – Canada's, for example – have had relatively low equity ratios. The low equity ratios of Canadian nationwide branching banks reflected their greater portfolio diversification and other risk-lowering attributes in contrast to the much riskier single-office (unit) banks in the US. The equity ratios of US banks have varied dramatically over time, and in ways that have clearly reflected changes in their asset risk. Equity ratios *relative to asset risk* are the key attribute of interest in prudential regulation, not equity ratios per se. Using simple historical equity ratios from some past example as a benchmark, without taking risk into account, can significantly overstate or understate the extent to which current equity ratios of large, global banks should be increased.

Concluding remarks

I support substantially raising book equity ratio requirements, albeit by considerably less than proposed by Admati and Hellwig. In my view, raising equity, although costly, is worth the costs because the benefits of a stable banking system exceed the costs of reduced loan supply that would attend the increase in required equity ratios. My approach to reform would raise required equity to roughly 10% of assets, and would also ensure that banks maintain that ratio in actual equity relative to risk (not just book equity). Because simply mandating an increase in book equity requirements does not ensure a commensurate increase in true equity requirements, or in true equity relative to risk, higher equity ratio requirements need to be accompanied by several other measures – in particular, as I have argued elsewhere, by a market-value-triggered convertible contingent debt (CoCo) requirement. Although it is beyond our scope here to explain the logic behind this proposed requirement, the point of requiring a substantial amount of these CoCos is to create strong incentives for banks to maintain true equity at least as great as book equity, and to limit their risks so that a 10% equity ratio would be adequate.

Editors' note: The views expressed here are those of the author and do not necessarily represent those of the institutions with which he is affiliated.

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Part III

On Basel III

3.1 Do not be detoured by bankers and their friends; our future financial salvation lies in the direction of Basel

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23 September 2011

The financial crisis revealed substantive problems that need to be solved, especially in the banking sector. This chapter argues that Basel III, the new accord on international banking, is an overdue step in the right direction. It should be defended against attempts by bankers and their friends to cut it down, dilute it, and postpone it.

For the past decade I have been a trenchant critic of the international banking rules developed in Basel. Nine years ago, I wrote an editorial in the *Financial Times*[1] highlighting the perverse irony of bankers capturing their regulators and yet fashioning international banking regulation in a way that would lead them to systemic collapse.

Basel III is worth defending

Once one becomes a critic it is always easier to remain one (the press and conference organisers like it that way). But while the new accord on international banking, popularly

1 "Banks put themselves at risk in Basel", October 2002.

known as Basel III, is far from perfect, it is on the right track and requires defending against attempts by bankers and their friends to cut it down, dilute it, and postpone it.

Bankers would like us to think that weak bank lending relates to tight and/or uncertain regulation. It is a seductive argument for politicians in Europe and the US as growth dries up and elections loom. But lending is weak because many borrowers are repairing their balance sheets and repaying loans. Many others are no longer creditworthy.

Basel III reforms represent a reorientation of regulation in the right direction; it reflects many lessons learned and some errors checked. The earlier the new rules are adopted, the earlier banking can shift to a more sustainable path, but once more banks are putting themselves at risk by trying to frustrate the process.

Financial crises are so complex with so many apparent causes that in their aftermath there is no shortage of clever solutions in search of a problem. Reforms are best measured by whether the problem they solve or address, if solved earlier, would have limited the crisis or, merely deflected it on to something else with little overall difference. The financial crisis revealed five substantive problems that need to be solved.

- First, we were once more reminded that booms are fuelled by an underestimation of risks.

From the perspective of the 'after-party', banks lent too much, too rapidly, and with too much leverage. This behaviour was self-feeding as lending pumped up asset prices, justifying further leverage. It was accelerated by the market-sensitive risk management approach and fair value accounting promoted by Basel II, in the name of Nobel-prize-winning sophistication and market discipline (see Persaud 2000).

- Second, banking regulation cannot fight against the excesses of the credit cycle alone.

Monetary and fiscal policy must play a role. While the shortcomings of monetary policy in addressing a boom in one or two sectors are well recognised, the importance

of fiscal policy is too often forgotten. Overly loose fiscal policy in the US after the dotcom bubble burst was a bigger contributory factor to the excessive consumption and overvalued dollar that fed the boom than monetary policy.

Regulatory policy must, at the very least, not amplify the credit cycle and this is what Basel II did. The Basel Committee responded with limits on leverage (the ratio of lending to equity) and countercyclical capital reserves designed to curb the enthusiasm for lending at the top of the economic cycle. I would argue for an even lower leverage ratio – say 20 times capital – and larger countercyclical provisions; but given Basel II had put all its faith in procyclical, market-sensitive risk-weightings, this is a good start in the right direction.

- Third, given the natural tendency of banks to underestimate risks in a boom, Basel II was too kind to large banks, allowing them to use their own internal risk systems to set lower regulatory capital, encouraging these systemically important institutions to grow in line with their own hubris.

Basel III responded with higher capital charges for systemically important institutions, better internalising the risks their size poses to the financial system. It is doubtful that these additional charges are big enough to change lending behaviour, but given Basel II had previously been shackled from doing this by the self-imposed imperative of 'level playing fields', this also is a good step in the right direction. Recent research on the effect of higher capital adequacy ratios on lending suggest that bankers do protest too much (see Miles et al. 2011).

- Fourth, the derivative markets have far outgrown their cash markets.

This is less worrisome than many feel in their bones. It is nonetheless a genuine problem in the fog of crisis. Whenever the large derivative markets encounter a crisis, problems arise from the fact that there is uncertainty as to where vulnerable positions are and how they are being unwound and netted off.

The Basel Committee responded, in an admirably measured way, by supporting new rules on mandatory trade reporting and incentivising the central clearing of all trades. Putting all exposures on balance sheet would also help, but to be fair that was already part of Basel II – implementation was just too slow. I believe that a small transactions tax may also help in limiting the production of systemically risky but socially questionable financial turnover.

- Fifth, this was a crisis of funding liquidity.

Basel II largely ignored liquidity and so the banks were incentivised to borrow cheaply from the markets rather than expensively from customers. This business model boosted profits during the calm time, but market liquidity is ephemeral and when things turn tricky it vanishes. This would have led to an economy-wide insolvency if banks were then forced sell all of their illiquid securities at the same time – which is why the central banks had no alternative but to step in. Those who believe that authorities should have stood still and let the banks fail have little history on their side to support such a courageous position.

Basel III has responded with a fundamental reform that requires banks to be better insulated from periods of financial market illiquidity and requiring a better matching of maturities of lending and borrowing. This latter proposal has elicited the greatest protests from banks and implementation has been kicked down the road till 2018. Bankers argue that borrowing short and lending long is what banks do. The correct response should be: "Exactly!" Most financial crises are rooted in liquidity problems in the banking system.

The nature of this crisis has meant that 'credit risk transfer' is seen as the villain of the piece, but we are in danger of throwing out the baby with the bath water. As Professor Charles Goodhart has bravely remarked, one of the underlying problems of the crisis was that there was not enough risk transfer, merely the transfer of illiquid assets off the balance sheet of the same institution.

The financial system would be safer if illiquid assets flowed out of the banking system towards insurance and pension funds and liquid assets flowed the other way. The principal-agent problem, where banks that originate debt in order to sell it on are not incentivised to care about the quality of the debt, is real enough, though in danger of being exaggerated, and can be managed by shifting bank remuneration for this activity from up-front origination fees to annual fees relating to the performance of the debt. One of the obstacles to a systemically safer allocation of risks is that the new regulation of holders of long-term liquidity like insurance and pension funds (Solvency II) discourages them from owning illiquid assets through increasing emphasis on market-sensitive value accounting and short-term solvency ratios. The only thing worse than Basel II was Solvency II.

To reduce systemic risks, individual risks need to be able to move to where they can be better absorbed. The name of the game is optimal risk allocation across the financial system. It is not about getting in the way of risk transfers by putting up barriers and lobotomising the financial system.

Concluding remarks

The real problem with Basel III is that the opportunity – presented by the crisis and the creation of the Financial Stability Board – for joined-up regulation in the name of better managing risk at the system-wide level was not grasped.

Grandly sounding systemic risk committees made up of the same people who missed the crisis the first time around isn't an adequate response. But let us at least ensure that those issues that were grasped by Basel III are not abandoned through pressure from banks arguing that the new regulations are the root of weak lending.

In truth, Basel III is an overdue step in the right direction.

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3.2 Basel regulation needs to be rethought in the age of derivatives, Part I

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28 February 2012

Amid the chaos of the Eurozone crisis, the debate over how to fix the banking system has been pushed to one side. This chapter aims to bring banking regulation back to the centre of attention. It argues that the Basel III regulations currently being proposed are already desperately out of date.

The systemic threat originating from sovereign debt problems in the Eurozone points to the need for recapitalisation of Eurozone banks well in advance of the (exceptionally slow) Basel III timetable.

Eurozone authorities have recognised this and, with market pressure intense, taken some action.

Helpful and welcome as recent moves have been, a more fundamental rethink of the Basel framework for determining minimum capital requirements for banks is needed. Basel III is just a quick and dirty repair job, consisting of patches applied to fix things that went visibly wrong during the past four years. But it involves no reconsideration of the structure of a fundamentally flawed system that is opaque and far too complex. The risk weight system at the core of the approach for calculating capital charges needs to be scrapped in its entirety and a more coherent approach to exposures arising from derivatives, notionally in excess of $600 trillion at the end of 2010, must be found.

Basel's main flaws

The central problem is that banks have almost unlimited scope to arbitrage the system by reallocating portfolios away from assets with high risk weights to assets with low risk weights, not least by trading derivatives. Given their powerful incentive to save on capital costs, they use this scope abundantly. New capital charges (e.g. the surcharge for globally systemically important banks) and stricter calibration (i.e. higher required ratios based on 'risk weighted assets') just encourage more of the same.

Bank responses to Basel incentives lead to three major problems:

- Capital charges are 'portfolio invariant', i.e. while they depend on the borrower's characteristics and the economic environment, they are not influenced by whatever else is in the portfolio. There is no role for diversification in determining minimum capital requirements. This contradicts everything we have ever learned about managing portfolio risk.
- Nevertheless, the risk weights, which act as a system of regulatory taxes and subsidies, create a bias against diversification by encouraging concentration in asset classes favoured by the regulatory system. Favoured classes have been residential real estate, sovereign debt, and interbank claims, i.e. system interconnectedness. It is not coincidental that these have been at the heart of the crises we have been living through since 2007.
- Since minimum capital requirements can be arbitraged downward with little effective limit, the system allows far too much leverage.

Basel and derivatives

The distortions caused by the system are often obscured by its complexity and opacity, especially as regards derivatives. Consider, as an example, a Basel III innovation to deal with unexpected counterparty credit risk losses on derivatives: the charge for credit valuation adjustment (CVA), i.e. unrealised losses marked-to-market which the Basel

Committee estimates accounted for two thirds of the total during the crisis (i.e. double actual defaults). The base for calculating this charge allows gross derivative positions vis-à-vis each counterparty to be netted out, i.e. bilaterally, and the charge is additive across counterparties. This may be superficially reasonable but has several unhelpful consequences.

- For large universal banks active in highly concentrated derivative markets, it seriously underestimates the underlying exposures. Bilateral netting allows the overwhelming bulk of derivative exposures, often of the order of 90% or more, to be ignored for purposes of calculating the CVA charge.[1] But many, if not most, positions may be valued very differently if the state of the world changes. Large losses last year by the MS/MUFG joint venture in Japan following an unexpected 45 basis point move in long-term interest rates there appear to be a case in point.
- Making the CVA charge additive across netted bilateral positions rewards counterparty concentration, limiting competition in derivatives trading, since concentration effectively increases the pools within which netting is permitted.
- All this operates to minimise the CVA charge.

A simple example may be helpful. Consider a bank with four derivative exposures which cancel to nothing (Table 1). In the diverse counterparty case a charge would be applied to the positive position, ie net claims, on counterparty A. But in the single counterparty case there is no charge since there is no net position. Thus there is no benefit for using a diversified group of counterparties and concentration is positively rewarded with lower capital charges. None of this makes sense.

1 For example, for Deutsche Bank at end-2008 a €1224.5 billion position was reduced to €128 billion; for Bank of America at end-2010 netting, with allowances for cash collateral, appears to have reduced $1519 billion to $73 billion.

Table 1 Bank with exposures from two interest rate swaps and two CDSs

Diverse counterparties		Concentration case	
Counterparty A		**Single counterparty**	
IRS 1 (up)	100	IRS 1 (up)	100
CDS 1 (down)	-90	CDS 1 (down)	-90
Net vs. A	10		
Counterparty B			
IRS 2 (up)	90	IRS 2 (up)	90
CDS 2 (down)	-100	CDS 2 (down)	-100
Net vs. B	-10	*Net position*	0

Source: OECD Secretariat

Implications

The overall result is a vast, poorly diversified, highly interconnected banking system supported by far too small a capital base. It has little resilience or capacity to cope with adjustment so local problems too easily become systemic. Collapsing subprime real estate prices in California and Florida and excessive supply of Greek government bonds may be major problems for borrowers and lenders directly affected, but neither by themselves could create a global crisis with a resilient, well-capitalised banking system.

The Basel system should clearly be replaced with one whose parameters cannot be arbitraged by portfolio reallocation and derivative activity.

3.3 The liquidity coverage ratio under siege

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28 July 2012

Those responsible for supervising the global financial system generally agree that international liquidity regulation must not only be harmonised, but also improved substantially. This chapter argues that any move towards dissolving this international consensus endangers financial stability in the EU.

In the aftermath of the outbreak of the economic and financial crisis in August 2007, the world's most important regulators and supervisors quickly arrived at the conclusion that international liquidity regulation must not only be harmonised, but also improved substantially. In December 2010 the Basel Committee of Banking Supervision published "Basel III: International framework for liquidity risk measurement, standards and monitoring". Two ratios constitute the core of the international policy response to the liquidity crisis – the liquidity coverage ratio (LCR) and the net stable funding ratio (NSFR).

The two liquidity standards...

The former aims at reducing bank reliance on short-term, fragile funding sources (e.g. unsecured interbank deposits with tenors below one month). The LCR is defined as the ratio of high quality liquid assets (HQLA) over net cash outflows over the next 30 days. Banks must maintain their LCR at or above 100%. HQLA are assets that are of

(extremely) high credit quality and (extremely) high market liquidity. The LCR is to be introduced by 2015.

The NSFR aims at "… promot[ing] more medium and long-term funding of the assets and activities of banking organisations" (BCBS 2010, p. 26). Depending on the liquidity characteristics of the bank's assets with a remaining maturity beyond one year, the bank must attract a minimum of stable funding to refinance these assets. The NSFR is to be introduced in 2018. The two liquidity standards are part of the implementation of Basel III in the EU via the Capital Requirements Directive IV and the Capital Requirements Regulation (CRD IV/CRR).

… constitute enormous progress in international banking regulation

The two liquidity standards constitute enormous progress in international banking regulation.

1. It is the first time in history that liquidity and reporting standards are internationally harmonised. For internationally active banks, this yields multi-billion dollar cost savings.
2. Currently, most liquidity standards have substantial shortcomings: They are backward looking, do not cover all sources of material liquidity risk, and are barely risk-sensitive (ECB 2007). The new functional approach (Schmitz and Ittner 2007) is forward looking, takes into account all sources of liquidity risk (e.g. off balance-sheet exposure), and is highly risk-sensitive.
3. Liquidity regulation in most countries concentrates on short-term shocks and pays much less attention to stability risk associated with a lack of stable medium- and long-term funding. The new NSFR addresses this risk. A series of economic impact studies concluded that the ratios would reduce the probability and costs of financial crisis (Macroeconomic Assessment Group 2011; BCBS 2010).

The international consensus on improving liquidity regulation is dissolving from within

Over the last few months the tone of core players in the regulatory and supervisory arena has changed dramatically, casting doubt on the future of the LCR.

On 14 June 2012, Bank of England Governor Mervin King (2012) argued that: "In current exceptional conditions, where central banks stand ready to provide extraordinary amounts of liquidity, against a wide range of collateral, the need for banks to hold large liquid asset buffers is much diminished, and I hope regulators around the world will take note."

On 22 June, the UK interim Financial Policy Committee recommended that the FSA would consider loosening micro-prudential liquidity standards to facilitate lending to the economy.

In a speech on 16 June 2012, ECB Board Member Benoît Cœuré (2012) highlighted that the revival of money markets was essential for the Eurozone. The LCR is mentioned only once throughout the speech: "It is important that the [LCR] does not hamper the functioning of funding markets. This applies in particular to the calibration of the run-off rates for interbank funding and to the asymmetrical treatment of liquidity facilities extended to financial firms." Cœuré denounces the very objective of the LCR – incentivising more stable funding instruments and longer funding tenors – as its major drawback.

This view is reiterated by Banque de France Governor Christian Noyer (2012, p. 3) on 26 June: "This is why we are accompanying the prudential reform with more general and macroeconomic reflections on the financing of the economy…. The new liquidity ratios therefore cannot be applied as they stand as they do not take into account all their consequences and interactions beyond the prudential objectives themselves, which include in particular the functioning of the interbank market, the level of intermediation or the conditions of monetary policy implementation."

The reasoning of these key players in the EU regulatory debate rests on the following arguments against the LCR:

1. EU banks are under funding stress. Thus, they should be allowed to make use of their liquidity buffers and decrease their liquidity risk-bearing capacity to spur lending to the economy.
2. Unsecured money markets are important for the implementation and transmission of monetary policy. The LCR might impede the return of the unsecured euro money market to pre-crisis activity levels.
3. Unsecured money markets serve as efficient price-discovery mechanisms (e.g. LIBOR rates) and contribute significantly to safe and sound banking via effective market discipline.

Also the IMF in its recent Global Financial Stability Report (IMF 2012) calls for a broader definition of HQLAs (with higher haircuts), because the demand for safe assets would further increase by $2 trillion to $4 trillion (IMF 2012, p. 100).

4. The IMF's stance is motivated by concerns about a shortage of safe assets. The LCR would increase the demand for safe assets further and thus increase pressure on that market.

To sum up, some of the key players in international regulatory reform have turned critical on the LCR. In the following I will go through the arguments put forth against the LCR.

Does the current funding stress of EU banks provide a reason to postpone or even rethink the LCR?

So, does the current funding stress of EU banks provide a reason to postpone or even rethink the LCR? No. The LCR is designed to increase banks' liquidity risk bearing capacity under short-term liquidity shocks. The current funding stress for European banks is neither short-term nor temporary. The funding conditions for banks have

structurally changed (Deutsche Bank 2012): The implicit government guarantee on bank liabilities is not credible anymore. Moreover, the future EU framework for bank recovery and resolution aims at reducing taxpayers' costs of banking crisis and proposes that supervisors should be able to bail-in unsecured bank bond holders. The crisis itself taught investors a lesson on unsecured bank bonds: they were not as safe as investors had initially thought. Given their large holdings of banks bonds, their demand on the primary market is very low. The LCR is not an effective lever to prevent or even reverse the structural shift in bank funding, as it does not address its drivers.

Does a general softening of the LCR calibration improve the funding conditions for EU banks?

No. On the contrary, it worsens the funding conditions for EU banks further. Investors discovered that unsecured bank bonds are less attractive in terms of risk-return characteristics than they had thought before the crisis. The attractiveness of unsecured bank bonds is further reduced by increasing asset encumbrance (i.e. EU banks aim at increasing collateralised funding). This effectively sub-ordinates unsecured bondholders. Furthermore, claims by the deposit insurance corporation often rank above unsecured bondholders, too. That subordination is reinforced by short-term borrowing; short-term creditors can reduce their exposure quickly by refusing to roll-over short-term funding, if they perceive insolvency risk to increase (e.g. Copeland et al. 2012; Krishnamurty et al. 2012).

A credible commitment of EU banks to lengthen average funding tenors and to maintain a low share of short-term funding in the future is a necessary (though by no means sufficient) condition for unsecured bank bond markets to re-open. Effective liquidity regulation provides exactly that kind of credible commitment to investors.

Are the costs of introducing the LCR substantial enough to impact the costs of lending to the real economy significantly?

The QIS 2011 revealed that the liquidity gap to comply with the LCR amounts to €1,150 billion for the European banks in the sample (roughly 4%-5% of their balance sheets). But the QIS also reveals that the main driver of outflows for European banks is unsecured funding from financial institutions, which contributes about a quarter of total cash outflows within 30 days. A reduction of EU banks' net short-term funding from financial institutions by about a half would already go a long way to achieving compliance.

Overall, lending to the real economy does not have to be affected; it accounts for only 45% of total assets of Eurozone monetary financial institutions (MFIs), so there is room for manoeuvre to adapt to the LCR without reducing lending to the real economy (Puhr et al. 2012). In that Vox column, the authors also argue that banks' competitive advantage lies in credit and liquidity risk assessment and management and that they have relatively more pricing power in loan/deposit markets than in financial markets. In order to preserve their franchise value, they'd avoid cutting loans supply.

Furthermore, one would have to look at risk-weighted rather than the absolute costs of increasing liquidity buffers to meet the LCR requirement; HQLAs consume less capital than the assets they replace. This (partly) offsets lower yields on HQLAs.

Finally, banks can also term out funding to meet the LCR. Since term premia are positive, this increases direct funding costs. But that does not necessarily increase credit spreads, since qualitative liquidity regulation already prevents banks from pricing long-term loans based on short-term funding costs (CEBS 2010). Finally, without the LCR the respective costs do not go away; they emerge as implicit (not immediately P&L effective) costs in the form of higher liquidity risk and potentially negative external effects on society. The LCR only makes these costs explicit and internalises them.

For all these reasons, the impact of the introduction of the LCR on the economy needs to be studied rigorously based on comprehensive bank level data. Art. 481(1) CRR mandates the EBA to do just this. The EBA Subgroup on Liquidity has put forth a comprehensive approach to fulfil this mandate rigorously.

Does the unsecured money market effectively enforce market discipline?

Does the unsecured money market effectively enforce market discipline? The answer again is no. The high leverage and the large share of short-term unsecured funding renders market discipline ineffective for EU banks. The proponents of market discipline assume that it is exerted smoothly without external costs to society. However, the textbook version of the process of market discipline conflicts with empirical evidence of the developments on the unsecured money market since 9 August 2007. The evidence shows that once market discipline actually bites, banks cannot deal with it. This is a consequence of banks' substantial liquidity risk at the very short tenors and their very high leverage: once counterparties refuse to roll-over short-term funding, banks cannot meet their payment obligations by relying just on cash-inflows and neither are their liquidity buffers sufficient to generate liquidity at acceptable costs. They have to resort to asset fire sales, which sharply increase insolvency risk and further exacerbate their funding strain (Brunnermeier and Pedersen 2009). Banks have to deleverage quickly and substantially. The resulting adverse economic impact immediately motivates public bailouts, i.e. by the provision of central bank funding and/or government guarantees (moral hazard) (Posch et al. 2009). Once the LCR is implemented, banks will be able to deal with sharp reductions in short-term unsecured interbank funding without the associated negative impact on the real economy, because they would rely less on short-term unsecured funding and hold higher liquidity buffers. So, the implementation of the LCR is a necessary (though not sufficient) pre-condition for market discipline to work effectively in banking rather than an obstacle to it.

Does the shortage of safe assets warrant a broadening of HQLA?

Does the shortage of safe assets warrant a broadening of HQLA? No. The objective of the HQLAs is increasing banks' liquidity risk bearing capacity. To reach that objective the eligible assets must be of (extremely) high credit quality and market liquidity. If this collides with a shortage of such assets, banks have to reduce their short-term net cash outflows. As discussed above, it is unlikely that the subordination of unsecured bank bondholders due to the shortening of average maturities of bank liabilities, contributes to bank liabilities regaining their statues as safe and liquid assets. If policymakers want to address the shortage of safe assets (which they should), other instruments are preferable; i.e. increasing the soundness of banks and non-bank bond issuers by increasing their own capital cushion is a more effective strategy.

Conclusions

The dissolving international consensus on the need to harmonise and improve liquidity regulation endangers the future stability of the EU banking system. Furthermore, decreasing banks' liquidity risk-bearing capacity does not contribute to improving banks' funding conditions, nor does it elevate the pressure on safe assets markets. At the same time, any potential detrimental unintended consequences of the LCR on SME lending, trade finance, and sustainable economic growth will be studied rigorously in the report pursuant to Art. 481(1) CRR.

For all these reasons, the high uncertainty that contributes to the caution of potential investors in unsecured bank bonds should not be worsened by conflicting signals on the commitment to the reform of liquidity regulation. This further discourages their investment in unsecured bank bonds and aggravates the funding crisis of EU banks.

Editors' note: The views expressed in this column are those of the author and do not necessarily reflect those of the OeNB.

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3.4 Governance of banks

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When the storm passes, bank regulation will top the global policy agenda. This chapter presents new evidence that a bank's private governance structure influences its reaction to bank regulation. Since governance structures differ systematically across countries, one-size-fits-all regulation may be ineffective. Bank regulations must be custom-designed and adapted as financial governance systems evolve.

Banks matter. When banks efficiently mobilise and allocate funds, they lower the cost of capital to firms and accelerate capital accumulation. When banks allocate credit to entrepreneurs with the best ideas (rather than to those with the most accumulated wealth or strongest political connections) productivity growth is boosted and more people can pursue their economic dreams. And, when banks manage risk prudently, the likelihood of systemic crises is reduced.

Of course, banks are double-edged. Banks that collect deposits with one hand and lend to friends and political cronies with the other stymie innovation and growth, while enriching the elite. And banks that gamble, protected on the downside by a generous government safety net, too frequently have sparked devastating crises that have exacted enormous human costs in virtually every country.

In turn, bank regulations and governance matter. If official regulations and private governance mechanisms foster well-functioning banks, the probability of costly crises is reduced and economic growth is accelerated along with the expansion of economic opportunities.

Unfortunately, regulations and governance systems too often fail to promote sound banking, as exemplified by the turmoil embroiling financial markets today.

Bank regulation and private governance: A critical, little understood nexus

In fact, little is known about how private governance mechanisms interact with national regulations to shape bank risk-taking. Rather, researchers and policymakers have focused on using official regulations to induce sound banking, while largely ignoring how owners, managers, and debt holders interact to influence bank risk.

Bank owners, debt holders, and managers frequently disagree about risk.[1] As in any corporation, diversified owners of banks (owners who do not have a large fraction of their personal wealth invested in the bank) have a greater incentive to increase risk than uninsured debt holders. Stock holders disproportionately enjoy the fruits of high-risk, potentially high-return investments, while debt holders want the bank to take as little risk as possible, while earning enough to pay them back. On risk, non-shareholder managers (managers who do not have a substantial equity stake in the bank) frequently align themselves with debt holders against diversified owners. Non-shareholder managers generally prefer to take less risk than owners because their jobs are linked to the survival of the bank. Of course, to the extent that the manager has a large equity stake in the bank or holds stock options, this would enhance his or her risk-taking incentives through enticing potentially large rewards for high-return investments. In practice, however, bank managers often do not hold much bank stock, placing them at odds with diversified bank owners in their views on risk taking.

Thus, the comparative power of owners, managers, and debt holders within bank's governance structure matters. Banks with an ownership structure that empowers

1 See influential theories by Galai and Masulis (1976) and Jensen and Meckling (1976), and recent empirical work on non-financial firms by John et al. (2008).

diversified owners will tend to take more risk than banks in which owners have less influence.

New evidence

In a recent paper (Laeven and Levine 2008), we test how national regulations interact with a bank's private governance structure to determine its risk-taking behaviour. It is crucial to examine regulations and governance simultaneously.

If regulations boost the risk-taking incentives of bank owners but not those of managers and debt holders, then the actual change in bank risk depends on the comparative power of owners within the bank's governance structure. Thus, the same regulation will yield different effects depending on the governance structure of each bank. Similarly, changes in policies toward bank ownership, such as allowing private equity groups to invest in banks or changing limits on ownership concentration, could have differential effects depending on bank regulations.

Examining national regulations or bank governance in isolation will almost certainly yield misleading results since regulations and governance structures differ across countries. To address this, we first collected new information on the ownership and management structure of banks and merged this with data on bank regulations around the world. The new database covers detailed data on banks across 48 countries and traces the ownership of banks to identify the ultimate owners of bank capital and the degree of ownership concentration.

Most big banks have very concentrated ownership

It turns out that banks around the world are generally not widely held, despite government restrictions on the concentration of bank ownership, though there is enormous cross-country variation.

- About 75% of major banks have single owners that hold more than 10% of the voting rights.
- 20 out of 48 countries do not have a single widely held bank (among their largest banks).
- Of those banks in our sample with a controlling owner, more than half are families.

Most governments restrict the concentration of bank ownership and the ability of outsiders to purchase substantial stakes in banks without regulatory approval, generally to limit concentrations of power in the economy. But regulatory restrictions on the concentration of bank ownership are often ineffective or not well enforced. Families employ various schemes, such as pyramidal structures, to build up control in banks.

Key results

- We find that banks with more powerful owners (as measured by the size of their shareholdings) tend to take greater risks.

This supports arguments predicting that equity holders have stronger incentives to increase risk than non-shareholding managers and debt holders and that large owners with substantial cash flows have the power and incentives to induce the bank's managers to increase risk taking.

Furthermore, the impact of bank regulations on bank risk depends critically on each bank's ownership structure such that the relationship between regulation and bank risk can actually change sign depending on ownership structure.

- For example, our results suggest that deposit insurance is only associated with an increase in risk when the bank has a large equity holder with sufficient power to act on the additional risk-taking incentives created by deposit insurance.
- The data also suggest that owners seek to compensate for the loss in value of owning a bank from capital regulations by increasing bank risk.

- Stricter capital regulations are associated with greater risk when the bank has a sufficiently powerful owner, but stricter capital regulations have the opposite effect in widely held banks.

Ignoring bank governance leads to incomplete and sometimes erroneous conclusions about the impact of bank regulations on bank risk taking.

Policy implications

These findings have important policy implications. They question the current approach to bank supervision and regulation that relies on internationally established capital regulations and supervisory practices. Instead, we find that:

1. Private governance mechanisms exert a powerful influence over bank risking; and
2. The same official regulation has different effects on bank risk taking depending on the bank's governance structure.

Since governance structures differ systematically across countries, bank regulations must be custom-designed and adapted as financial governance systems evolve.

Regulations should be geared toward creating sound incentives for owners, managers, and debt holders, not toward harmonising national regulations across economies with very different governance structures.

Editors' note: While one of the authors of this column is a staff member of the International Monetary Fund, the views expressed herein are those of the authors and should not be attributed to the IMF, its Executive Board, or its management.

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3.5 Implementation of Basel III in the US will bring back the regulatory arbitrage problems under Basel I

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Rejigging financial regulation is in vogue. But, in the world of international finance, how well do different regulatory systems join up? This chapter argues that the US Dodd Frank Act and Basel III are, in part, incompatible and that harmonising them may lead to unintended consequences. The US ought to tread carefully here but should also try hard to maintain the spirit of better financial regulation.

In the aftermath of the global financial crisis, many countries have been redesigning their financial regulatory frameworks. In the US, the Dodd Frank Act of 2010 specified the directions for new financial regulations. The US financial regulatory agencies, including those that were newly created by Dodd-Frank, have been busy writing and rewriting the rules.

At the international level, the Basel Committee on Banking Supervision has come up with the third implementation of the international standard for minimum capital regulation ('Basel III'). However, in several areas, the requirements of Dodd-Frank are apparently inconsistent with those of Basel III and thus US regulators face a difficult task of reconciling the two regulatory initiatives.

Harmonising regulation, unintended consequences

On 7 June 2012, the US Office of the Comptroller of the Currency, the Federal Reserve System, and the Federal Deposit Insurance Corporation came up with three "Notices of Proposed Rulemaking" on regulatory capital rules. These proposals entail new capital regulations for the US banks, reconciling apparent discrepancies between Dodd-Frank and Basel III.

I focus on one aspect of the Notices of Proposed Rulemaking from which there is likely to be a serious unintended consequence, if implemented. First, it is worth noting that the implementation of Section 171 of Dodd-Frank includes the following requirement:

> *"The appropriate Federal banking agencies shall establish minimum risk-based capital requirements on a consolidated basis for insured depository institutions, depository institutions holding companies, and nonbank financial companies supervised by the Board of Governors. The minimum risk-based capital requirements established under this paragraph shall not be less than the generally applicable risk-based capital requirements, which shall serve as a floor for any capital requirements that the agency may require, nor quantitatively lower than the generally applicable risk-based capital requirements that were in effect for insured depository institutions as of the date of enactment of this Act".*

Dodd-Frank sets "the generally applicable risk-based capital requirements" as a floor that regulated financial institutions must satisfy in addition to any other minimum risk-based capital requirements that the regulators may impose. "The generally applicable risk-based capital requirements" are defined as follows:

> *"For advanced approaches banking organisations, the regulatory capital requirements proposed in this [Notice of Proposed Rulemaking] and the Standardized Approach [Notice of Proposed Rulemaking] would be 'generally applicable' capital requirements for purposes of section 171 of the Dodd-Frank Act (August 2012 NPR).*

Even those banks that calculate the risk-weighted assets using advanced approaches are required to hold enough capital required by the standardised approach. The problem is that the standardised approach is based on the old methodology of classifying assets into several risk buckets, which was originally used in Basel I regulation.

A flawed approach

The flaws of this approach have been noted by many researchers and practitioners.[1] Since the risk weights classification in the Basel I regulation was coarse, the same 'bucket' included the assets with very different risk levels. This led some banks to shift their portfolios to hold more risky (and hence higher return) assets within the same risk assets category, thereby increasing their risk without increasing regulatory capital. Because all the sovereign bonds of investment grade had the same risk weights (zero), banks were able to increase the return by increasing the holding of the most risky ones.

Because highly rated tranches of securitised loan products carried lower risk weights than individual loans, banks were able to economise on regulatory capital by selling the loans that they originated and by buying (highly rated) securitised loan products.

It is now well understood that the incentive for these regulatory arbitrages created by the Basel regulation increased risk in the banking system without a corresponding increase in risk-weighted assets – and hence regulatory capital.[2] The standardised approach in the Basel III Notices of Proposed Rulemaking include some improvements over the Basel I approach. For example, the risk weights classification is now finer. The classification is, however, still insufficient to make the risk-weighted assets sensitive enough to risks calculated by more advanced approaches.

1 See Jones (2000) and Dewatripont et al. (2010, Chapter 3) for example.

2 This is clearly shown in Figure 1 of Acharya (2012). Similarly, Figure 4 of Bruno and Shin (2012) shows this was the case for Barclays.

Assigning risk is too ad hoc

Another problem is caused by the inevitably ad hoc nature of assignment of a risk weight to each category of assets. Because of this problem, creation of finer 'buckets' can actually distort bank behaviours even more if the allocated risk weights differ from the risk differentials that banks perceive. For example, according to the Notice of Proposed Rulemaking on the Standardised Approach, residential mortgages are classified into eight buckets depending on the loan-to-value ratio and the type of loan and given different risk weights. Thus, the classification is finer than that in Basel I, which assigned 50% risk weight to all mortgage loans. Now a 30-year amortising mortgage with the loan-to-value ratio between 60% and 80% gets risk weight of 50%, while an interest-only loan with the same loan-to-value ratio receives increase the 100% risk weight.

This would be fine if the bank sees the interest-only loan as twice as risky as the 30-year amortising loan and requires twice as much capital. If that is not the case, the bank will have an incentive to reduce one type of loan and increase the other. For example, if the bank sees that the risk of the interest-only loans they originate are not quite twice as high as the risk of the 30-year amortising loans, the new capital regulation will discourage the bank from originating such interest-only loans. At the same time, some other banks may find the type of interest-only loans that they generate are actually more than twice as risky as their 30-year amortising loans. In that case, these banks will actually amount of interest-only loans.

Conclusions

The international Basel III allows banks to use the advanced approach to calculate the regulatory capital, so the banks in Europe and Japan that are qualified to use the advanced approach do not have the problem faced by US banks. The problem is that Dodd-Frank requirements for US banks set a floor of the "generally applicable risk-based capital requirements". To avoid reviving the problems we know from Basel I

regulation, US regulators should find a way around imposing the standard approach to advanced approaches banks, while respecting the spirit of Dodd-Frank at the same time.

Editors' note: The views expressed here are those of the author and do not necessarily represent those of the institutions with which they are affiliated.

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Part IV

Wider considerations

4.1 Big banks and macroeconomic outcomes

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The regulation of big banks has been in the spotlight for many reasons. This chapter adds to the list. Examining evidence for more than 80 countries for the years 1995-2009, banking systems are shown to be highly concentrated. In many cases, the banks are so big that bank-specific credit-growth fluctuations affect the macroeconomy.

Does the mere presence of big banks affect macroeconomic outcomes? Given that large banks can indeed be important for macroeconomic outcomes and financial stability, a number of current policy initiatives are aimed at limiting the impact of bank size: levies to finance bank-restructuring funds are often progressive in bank size; under Basel III, capital surcharges are higher for systemically important banks; in the Eurozone, the Single Supervisory Mechanism under the ECB applies in particular to banks whose total assets exceed €30 billion or 20% of their home economy's GDP.

Some observers go further by advocating breaking up the big banks (Johnson and Kwak 2010).

Despite this plethora of policy measures and policy proposals, studies of the link between bank size and macroeconomic outcomes are surprisingly few, so our understanding of the implications of the presence of large banks remains limited. Conceptually, there are several different reasons why bank size may matter. Bailout expectations by large banks

may invite imprudent risk-taking ('too big to fail'), and close linkages between large banks and highly leveraged shadow financial institutions may destabilise the entire financial system ('too connected to fail'). Along these lines, researchers have investigated issues of connectedness, spillovers, and exposure to common macroeconomic shocks.[1] In a recent study (Bremus et al. 2013), we ask whether bank size matters in a more basic sense – even in the absence of contagion, spillover effects, or shared responses to macroeconomic shocks. We focus on granular effects as a channel through which large banks can affect macroeconomic outcomes.

The theory of granularity in economics posits that, if some firms in an industry serve a very large share of the market, idiosyncratic shocks to the largest producers do not average out across the population of firms, but rather affect aggregate outcomes (Gabaix 2011). For US non-financial firms, Gabaix shows that, if market concentration is high, aggregate fluctuations of output growth are proportional to the product of market concentration and idiosyncratic, firm-level fluctuations. As a consequence, an increase in either concentration or in firm-level fluctuations increases aggregate fluctuations.

Given the high degree of concentration in the financial sector, we apply this concept to the banking industry in two steps:

- First, we determine whether the banking sector in theory and in practice fits the necessary conditions for granular effects to arise.
- Second, we test whether the presence of big banks as measured by a high level of market concentration is associated with a statistically significant relationship between bank-level credit growth and macroeconomic outcomes.

Our answer to both questions is 'yes'.

1 See, in particular, Acharya and Steffen (forthcoming), Adrian and Brunnermeier (2011), Ashcraft and Duffie (2007), Corbae and D'Erasmo (2013), Hale (2012), and Tarashev et al. (2009, 2010).

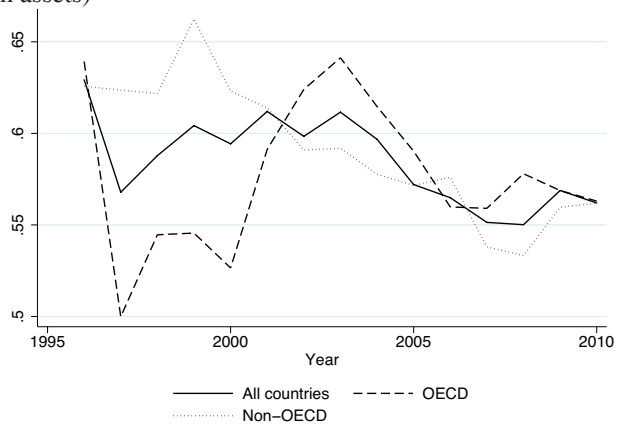
Cross-country evidence on bank-size distributions

The focus on bank size in public policy debates and the media is inspired by some sensational bank failures, but also by the general observation that the banking sector in many countries is very concentrated. Figure 1 shows the median values of concentration in the banking sector for a panel of more than 80 countries.[2] The graph illustrates that the share of the three largest banks' assets in a country's total bank assets is larger than 50% throughout the sample period for both OECD and non-OECD countries.[3] Hence, banking sectors are highly concentrated with just a few banks serving a very large share of the market. Moreover, the OECD (2010) points out that merger activity during the global financial crisis has, in fact, led to even higher concentration in many countries. Other industries are highly concentrated as well, but banking is impressive even in this context. For example, the top ten manufacturing firms in Germany account for about 30% of the overall business volume in manufacturing compared to a share of roughly 50% of overall business volume in the banking sector for the ten largest banks (Monopolkommission 2012).

2 The data is taken from the Financial Structures Database by the World Bank (Beck et al. 2009, Cihak et al. 2012). The countries included here are Algeria, Argentina, Australia, Austria, Bangladesh, Belgium, Benin, Bolivia, Brazil, Bulgaria, Cameroon, Canada, Chile, China, Colombia, Costa Rica, Croatia, Czech Republic, Denmark, Dominican Republic, Egypt, El Salvador, Estonia, Finland, France, Georgia, Germany, Ghana, Greece, Guatemala, Honduras, Hungary, India, Indonesia, Ireland, Israel, Italy, Japan, Jordan, Kenya, Korea, Kuwait, Latvia, Lithuania, Malawi, Malaysia, Mali, Mauritius, Mexico, Mozambique, Nepal, Netherlands, Nicaragua, Norway, Pakistan, Panama, Paraguay, Peru, Philippines, Poland, Portugal, Romania, Russia, Rwanda, Senegal, Slovak Republic, Slovenia, South Africa, Spain, Sri Lanka, Sudan, Sweden, Switzerland, Thailand, Tunisia, Turkey, Uganda, United Kingdom, United States, Uruguay, Venezuela, Zambia, Zimbabwe.

3 Note that these statistics are based on Bankscope data which does not include all banks in a given country and year. Due to the incomplete coverage, concentration ratios are just a proxy for the market share of the three largest banks.

Figure 1 Concentration in the banking sector (three-bank concentration ratio based on assets)



Notes: This figure displays the median values of three-bank concentration ratios for 83 countries. All countries" represents the median across the full sample, while "OECD" and "Non-OECD" show median values across the OECD and non-OECD countries within the sample.

Source: Financial Structures Database, The World Bank.

Not only are banking systems highly concentrated in general, but banks' assets relative to GDP have also increased quite sharply in OECD countries. This magnifies the effect that shocks to any one bank may have for the real economy.

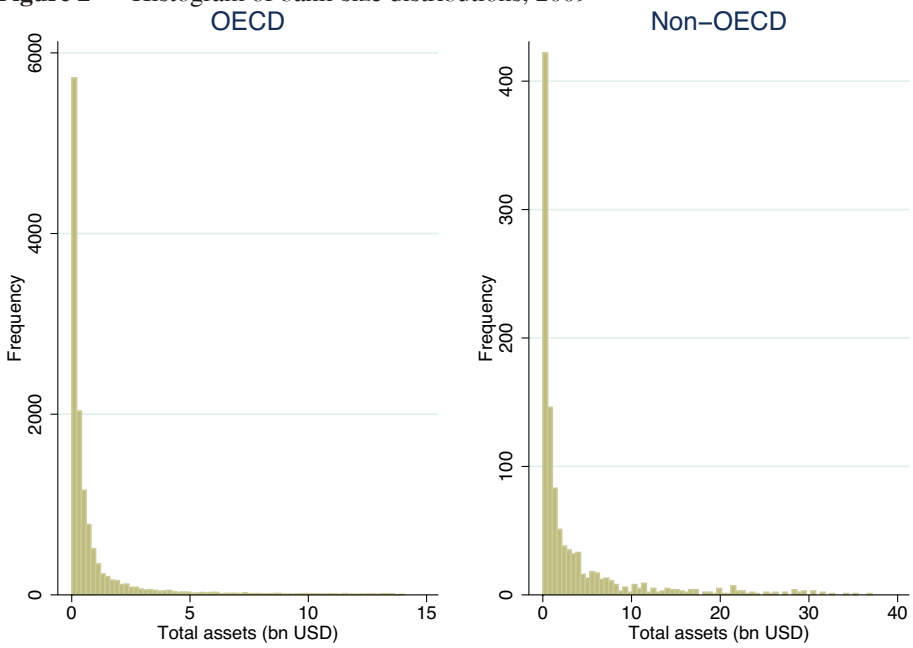
The necessary condition for such granular effects to emerge from the banking sector is that the bank-size distribution is strongly skewed to the right. The largest banks in an economy have to be large enough relative to the entire market such that bank-specific fluctuations in the largest banks' credit growth do not to average out in the aggregate. Mathematically speaking, this means that bank size must follow a fat-tailed power law.

Using data on banks' total assets from Bankscope, we show for many countries that bank size distributions are highly skewed and indeed follow a power law with a fat right tail. Hence, the necessary condition for granular effects is fulfilled. Figure 2 plots the empirical bank size distributions for OECD and non-OECD countries, where size is measured by banks' total assets.[4] Country-specific plots look very similar. The bars

4 See Bremus et al. (2013) for the bank-size distributions of individual countries.

indicate the frequency of banks of a given size. In order to enhance visibility, the top 5% of banks in terms of size are not plotted. The graphs show that many small banks coexist with a few extremely large ones. This, in turn, means that concentration is very high.

Figure 2 Histogram of bank-size distributions, 2009



Notes: This figure shows the empirical distribution of banks' total assets (in billions of dollars) for 83 countries in 2009, divided into OECD and non-OECD countries. The top 5% of banks with respect to total assets are not included to enhance visibility.

Source: Bankscope, Bureau van Dijk.

Granular effects from the banking sector

Having seen that the banking sector is highly concentrated, the question arises as to whether bank-specific shocks can have a perceptible effect on macroeconomic aggregates like credit or GDP. To answer this question from a theoretical point of view requires two ingredients:

- First, the nature of heterogeneity across banks and the nature of idiosyncratic, bank-

specific shocks need to be discussed.

Idiosyncratic shocks can result from product innovations, changes in the management team, or unexpectedly high default rates in specific market segments.

- Second, a model is needed which allows quantitative analysis of the impact of these idiosyncratic shocks for the macroeconomy.

Do these shocks affect the macroeconomy because banks are linked among each other, because they support too-big-to-fail subsidies, or simply because the allocation of productivity across banks is heterogeneous?

In a recent theoretical contribution, we abstract from many of these issues and take a very simplistic approach to modeling a banking firm (Bremus et al. 2013). Banks are funded by deposits from households, and they provide working capital loans to firms. The only feature that distinguishes our model from a 'plain vanilla' banking model is heterogeneity. Similar to recent advances in the international-trade literature (di Giovanni and Levchenko 2012), we assume that banks draw productivity from a Pareto distribution, to match the size distribution observed in the data, then we build in strategic competition in loan pricing common in other banking models. Using these very simple ingredients, we show that granular can effects arise under very feasible conditions: if concentration in the banking sector is high so that a few very large banks dominate the credit market, idiosyncratic shocks to large banks translate into fluctuations in aggregate credit growth. Given that firms have to fund at least part of their investment by bank loans, fluctuations in the loan market can be transmitted to the real economy via firms' external funding situation.[5]

Our empirical results based on this framework using a linked micro-macro dataset of more than 80 countries for the period 1995-2009 confirm granular effects emerging

5 Using linked firm-bank data on lending, Amiti and Weinstein (2013) find that idiosyncratic shocks to banks lead to fluctuations in aggregate credit and investment.

from the banking sector. In order to get a measure of idiosyncratic, bank-level shocks, we have to purge each individual bank's credit growth from common banking and macroeconomic factors. To do so, we follow Gabaix (2011) and take the difference between each individual bank's credit growth and the average credit growth in the bank's domestic market. We then compute a measure of bank-level shocks for each country by taking the weighted sum across every bank's idiosyncratic change in credit growth, the weights being the bank's market share in its home country. The weighted sum of bank-level credit shocks is named 'banking granular residual'. Using fixed-effects panel estimation, we analyse whether the banking granular residual affects aggregate credit and GDP growth in our sample.

The results show that idiosyncratic bank-level shocks have a positive and statistically significant effect on both aggregate credit and GDP growth. Thus, as banking sectors are highly concentrated, idiosyncratic shocks to large banks do not cancel out, but are rather linked to the variation in macroeconomic variables. Under a less skewed distribution of bank size, this would not be the case: bank-level shocks would not be felt in the aggregate.

Implications for regulatory policy

The presence of big banks – by itself – can drive variation in the aggregate supply of credit or output (i.e. GDP). Thus, policies which lead to increased concentration can lead to increased macroeconomic fluctuations, even in normal times. What implications can policymakers retrieve from our study? One immediate reaction may be that, indeed, drastically reducing bank sizes may be the way out. However, such policies would be an extreme intervention into market forces with serious side effects: large banks with proper incentives can be more diversified than smaller ones and thus more stable (especially large banks that are active internationally are important for the financing of international trade) and perhaps most importantly, small banks can be systemically important as well if many small banks are exposed to the same macroeconomic risks

('too many to fail'). Hence, a reduction of bank sizes may not necessarily bring about higher financial stability.

For these reasons, we advocate a more balanced approach to policymaking:

- First, reducing the risk-taking incentives of larger banks and thus the magnitude of idiosyncratic shocks will limit granular effects.

These reduced risk-taking incentives can arise through changes in the governance structure of banks, enhancing monitoring incentives of equity owners, and also from reduced public subsidies to banks.

- Second, the higher the risk-buffers of the banks themselves, the less severe the implications of idiosyncratic shocks for the macroeconomy.

This has (partly) been acknowledged in the new capital adequacy regulation under Basel III but we need more research to fully understand the feedback between capital requirements, market structure in banking, and macroeconomic developments.

- Third, reduced concentration in the banking sector could be a means of mitigating granular effects. Hence, competition policy has an important role to play.

In bank restructuring cases, the way that the assets of failed banks are liquidated matters. Regulators should avoid helping the big banks to get bigger. In short, analysing bank mergers only in terms of market power or loan pricing systematically underestimates their impact for the overall economy. One reason is that it overlooks the implications of mergers en totem for the size of future fluctuations in the aggregate credit supply and GDP.

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4.2 Sudden financial arrest

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17 September 2009

How should governments respond to sudden failure of the financial system? This chapter says that it is neither credible nor desirable to refuse to assist the private sector in financial crises. It makes the case for massive provision of credible public insurance and guarantees to financial transactions and balance sheets – a financial defibrillator to respond to sudden financial arrest.

> *"Sudden cardiac arrest (SCA) is a condition in which the heart suddenly and unexpectedly stops beating. When this happens, blood stops flowing to the brain and other vital organs…. SCA usually causes death if it's not treated within minutes…." (US National Institute of Health)*

There are striking and terrifying similarities between the sudden failure of a heart and that of a financial system. In the medical literature, the former is referred to as a sudden cardiac arrest (SCA). By analogy, I refer to its financial counterpart as a *sudden financial arrest* (SFA).

When an economy enters an episode of SFA, panic takes over, trust breaks down, and investors and creditors withdraw from their normal financial transactions. These reactions trigger a chain of events and perverse feedback-loops that quickly disintegrate the balance sheets of financial institutions, eventually dragging down even those institutions that followed a relatively healthy financial lifestyle prior to the crisis. In this article I draw on the parallels between SCA and SFA to characterise the latter and to argue that a pragmatic policy framework to address SFA requires a much larger

component of systemic insurance than most policymakers and politicians currently support.

Risk factors and preventive medicine

An important risk factor behind SCA is coronary artery disease, and the front line for its prevention is a healthy lifestyle. However, the medical profession is keenly aware that people make poor choices regardless of warnings and that even those who do adopt a healthy lifestyle and have no known risk conditions may still experience a fatal SCA episode. The pragmatic response to these facts of life is to complement preventive healthy lifestyle guidelines and advise with an effective protocol to prevent death once SCA takes place. The main (and perhaps only) option to treat SCA once triggered is the use of a defibrillator. Moreover, the window of time for this treatment to be effective is very narrow, just a few minutes, making it crucial to have defibrillators readily available in as many places as is economically feasible.

Need for a financial defibrillator and fuzzy moral hazard reasoning

Unfortunately, the pragmatic approach followed by the medical profession in reducing the risk of death associated with SCA contrasts sharply with the stubborn reluctance to supplement the financial equivalent of policies reducing coronary artery disease-risk (mostly regulatory requirements) with an effective *financial defibrillator* mechanism. The main antidote to SFA is massive provision of credible public insurance and guarantees to financial transactions and balance sheets. In this analogy, these are the financial equivalent of a defibrillator.

The main dogma behind the great resistance in the policy world to institutionalise a public insurance provision is a fuzzy moral hazard argument. If the financial defibrillator were to be implanted in an economy, the argument goes, banks and their creditors

would abandon all forms of healthy financial lifestyle and would thus dramatically increase the chances of an SFA episode.

This moral hazard perspective is the equivalent of discouraging the placement of defibrillators in public places because of the concern that, upon seeing them, people would have a sudden urge to consume cheeseburgers, since they would realise that their chances of surviving an SCA had risen as a result of the ready access to defibrillators.

But actual behaviour is not so forward-looking and rational. People indeed consume more cheeseburgers than they should, but this is more or less independent of whether defibrillators are visible or not. Surely, there is a need for advocating healthy habits, but no one in their right mind would propose doing so by making all available defibrillators inaccessible. Such policy would be both ineffective as an incentive mechanism and a human tragedy when an episode of SCA occurs.

By the same token, and with very few exceptions (Fannie and Freddie?), financial institutions and investors in bullish mode make portfolio decisions that are driven by dreams of exorbitant returns, not by distant marginal subsidies built into financial defibrillators. Nothing is further from these investors' minds than the possibility of (financial) death, and hence they could not ascribe meaningful value to an aid which, in their mind, is meant for someone else. This is simply the other side of the risk-compression and undervaluation during the boom phase. Logical coherence dictates that if one believes in this undervaluation, then one must also believe in the near-irrelevance of anticipated subsidies during distress for private actions during the boom.

Of course, once the crisis sets in, insurance acquires great value and leads to more risk-taking and speculative capital injections into the financial system, but by then this is mostly desirable since the main economy-wide problem during a financial panic is too little, not too much, risk-taking. The last thing we need at this time is for creditors to panic and shortsellers to feast, as they suddenly realise that financial institutions can indeed fail from self-fulfilling runs, fires sales, and liquidity dry-ups, for which there is no counteracting policy framework in place aside from ill-timed 'market discipline' or

high-risk surgery. Indeed, attempting to 'resolve' a large and interconnected institution in the middle of a panic, when asset prices are uninformative and hence 'resolution' decisions are largely arbitrary, carries the serious risk of adding fuel to the fire (panic).[1]

What to do when SFA occurs

In any event, when SFA does take place, it becomes immediately apparent to pragmatic policymakers that there is no other choice than to provide massive support to distressed institutions and markets, but since the channels to do so are not readily available, precious time and resources are wasted groping for a mid-crisis response (recall the many flip-flops during the early stages of the TARP implementation). If one is of the view (which I am not) that hubris plays only a small role during the boom and instead it is all about incentive problems due to anticipated subsidies during distress, then one must believe that savvy bankers and their creditors anticipate intervention anyway. Hence the incentive benefit of not having financial defibrillators readily available does not derive from the absence of a well designed ex ante policy framework but from the real risk that improvised ex post interventions may fail to be deployed in time to prevent death from SFA. This logic seems contrived at best as the foundation for a policy framework that does not include readily available financial defibrillators.

1 One way to get a sense of how much the market values the 'too big to fail' insurance provided by the government is to compare the cost of funding for small and large banks. Baker and McArthur (2009) compare the average costs of funding for banks with more than $100 billion in assets to the average costs for banks with less than $100 billion. They find that between the first quarter of 2000 and the fourth quarter of 2007, the large banks' costs were 0.29 percentage points lower than the small banks, averaging across time. Between fourth quarter 2008 and second quarter 2009, the spread increased to 0.78 percentage points. Clearly, there are many reasons why larger and smaller banks can have different costs of funding: different types of assets, different amounts of leverage, and so on. Baker and McArthur (2009) take the difference between these spreads, 0.78 minus 0.29, as a crude upper-bound on the subsidy associated with the solidification of the 'too big to fail' policy after Lehman's collapse. I would suggest an alternative interpretation: During boom times, the 'too big to fail' insurance was there but of little importance, while during the crisis, it became much more important and probably a source of stability.

SFAs will continue to occur regardless of regulation

In summary, it is a fact of life, and of cognitive distortions, financial complexity, and innovation in particular, that SFA episodes will continue to happen regardless of how much regulatory creativity policymakers may muster. The absence of a financial defibrillator is a very weak incentive mechanism during the boom phase and a potential economic tragedy during a financial crisis. We need a more pragmatic approach to SFA than the current monovision coronary-artery-disease-style, hope-for-the-best, approach. We need to endow the policy framework with powerful financial defibrillators.

Modern economies already count on one such device in the lender of last resort facility housed at the central bank, but this has clearly proven to be insufficient during the recent crisis. I discuss three supplements to this facility:

- *Self insurance*, which is where policymakers' instinct lies. In the current context this is reflected in a call for higher capital adequacy ratios, especially for systemically important financial institutions.
- *Contingent capital injections*, which is where most academics' instinct lies. The basic idea is to reduce the costs associated with holding capital when is not needed. Proposals primarily differ on whether the contingency depends on bank-specific or systemic events, and on whether the source of capital is external to the distressed bank or internal (as in the debt-convertibility proposals).
- *Contingent insurance injections*, which is the most cost effective mechanism for the panic component of SFA. The basic idea is that the enormous distortion in perceived probabilities of a catastrophe during panics can be put to good use since economic agents greatly overvalue public insurance and guarantees. Providing these can be as effective as capital injections in dealing with the panic at a fraction of the expected cost (when assessed at reasonable rather than panic-driven probabilities of a catastrophe).

In practice, there are good reasons to have in place some of each of these types of mechanisms. For normal shocks, it is probably easiest to have banks self- and cross-insure. For large shocks, there is always a fundamental component, which is probably best addressed immediately with contingent capital (private at first and in extreme events, public). However, the large panic component of an SFA episode requires large amounts of guarantees, which would be too costly and potentially counterproductive (if they add to the fear of large dilutions) to achieve through capital injections. For this component, a contingent-insurance policy is the appropriate response.

One particularly flexible form of a contingent insurance programme is the Tradable Insurance Credits proposed in Caballero and Kurlat (2009a). These act as contingent (on systemic events) CDS to protect banks' assets against spikes in uncertainty. They are a (nearly) automatic, pre-paid, and mandated mechanism to ring-fence assets whose price is severely affected by SFA, as it was done ex post in the US for some Citibank and Bank of America assets and was offered more broadly in the UK.[2]

The international dimension

The international dimension of SFA adds its own ingredients. I focus on the problem for emerging markets which has a close parallel with the issues faced by the financial sector within developed economies.

For emerging markets, it is often the case that the sovereign itself becomes entangled in the crisis as the main shortage is one of international rather than (just) domestic liquidity. Most policymakers in emerging economies are acutely aware of this danger, which is one of the main reasons they accumulate large amounts of international reserves. However, large accumulations of reserves are the equivalent to self-insurance

2 It turns out that the Bank of America deal was never signed, but the perception that it had been was enough to contain the panic. The UK system was less successful in terms of the takers than it would have been socially optimal because it was voluntary and very expensive. Both aspects would be improved by the Tradable Insurance Credits framework.

for domestic banks – they are costly insurance facilities. For this reason, many of us have advocated the use of external insurance arrangements, and the IMF has spent a significant amount of time attempting to design the right contingent credit line facility.

In the full paper from which this chapter is drawn, I propose a system akin to the Tradable Insurance Credits but aimed at supporting the value of emerging market new and legacy emerging debt during global SFA episodes. I refer to these instruments as E-TICs and envision them as being controlled by the IMF rather than by the US or other developed economies' governments.[3]

Editor's note: This chapter is drawn from Ricardo Caballero's Mundell-Fleming Lecture, delivered at the Tenth Jacques Polak Annual Research Conference, IMF, 5-6 November 2009.

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3 For developed economies, the international liquidity shortage problem is much less significant and it was appropriately dealt with the swap arrangements between major central banks. These should remain in place, at least on a contingent (to SFA) basis. A more delicate problem for these countries stems from the high degree of cross-borders interconnectedness of their financial institutions and the potential arbitrage and free riding issues that may emerge from differences in the type of financial defibrillators available. This raises international coordination issues which I don't develop in this paper but that obviously need to be addressed.

4.3 Shadow banking: Economics and policy priorities

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The risks associated with shadow banking are at the forefront of the regulatory debate. Yet, this chapter argues that there is as yet no established analytical approach to shadow banking. This means that policy priorities are not clearly motivated. But if we analyse securitisation and collateral intermediation – the two shadow banking functions most important for financial stability – a solid framework that includes existing policy recommendations, as well as some alternative ones, begins to emerge.

The past decade has witnessed rapid growth in a distinct form of financial intermediation: shadow banking. Today, in many advanced countries shadow banking rivals the traditional banking system. Since shadow banking is a recent phenomenon, its economic role is not yet well understood. This makes it hard to formulate a policy response or analyse existing proposals. Yet, regulation of shadow banking has been prominent in recent news (see FSB 2012).

Our recent paper (Claessens et al. 2012) aims to clarify the debate by focusing on the two economically most important shadow banking activities: securitisation and collateral intermediation. These functions are what we might call 'bank-like', as they involve risk and maturity transformation and can, like banks, be unstable. Indeed, the collapse of securitisation and the distress of dealer banks (which are central to collateral

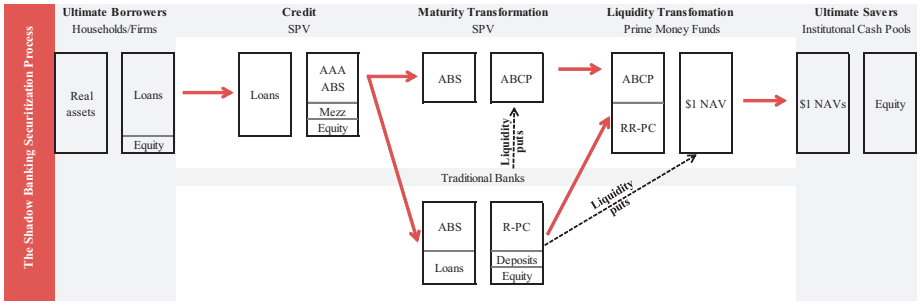
intermediation) were major factors behind the depth and the duration of the current financial crisis.

Securitisation

The first key shadow banking function, securitisation, is a process that repackages cash flows from loans to create assets that are perceived by market participants as almost fully safe and liquid. The repackaging occurs in steps, and takes the form of risk transfer (Figure 1). First, risky long-term loans are 'tranched' into safe and complementary ('equity' and 'mezzanine' respectively) tranches. Then the safe tranche is funded in short-term money markets, with additional protection provided by liquidity lines from banks. The resulting assets, such as Asset-Backed Commercial Papers (ABCPs), were regarded prior to the crisis by market participants as safe, liquid, and short-term, i.e. almost money-like, but with returns exceeding those on short-term government debt.

Prior to the crisis, the demand for these private money-like assets came from two sources. One was rapidly growing cash pools – held by corporations and the asset management complex – that faced a scarcity of safe investment opportunities (Pozsar 2011). Another was banks that used securitised assets for regulatory arbitrage (to minimise capital charges) and as collateral to attract repurchase agreement (or 'repo') funding (Greenlaw et al. 2008; Gorton and Metrick 2011).

Figure 1 The shadow banking securitisation process



Notes: The credit transformation special-purpose vehicles (SPVs) have matched maturity funding and issue asset-backed securities (ABS) or collateralised debt obligations (not shown). The maturity transformation SPVs are funded short term (are maturity mismatched) and issue asset-backed commercial paper (ABCP) or other structured money market instruments, such as auction rate securities (not shown). Private collateral (PC) includes ABS, corporate bonds, and equities. $1 NAV is the stable net asset value (a promise to repay at least $1 on $1 invested). R = repo; RR = reverse repo.

Effects of the crisis

The crisis showed some fundamental flaws in this process. Importantly, the perception of safety led to an ignorance of 'tail risks', the possibility of rare negative events, which ultimately materialised in the form of a broad decline in US house prices. As a result, claims that were initially perceived to be safe proved to be risky. When market funding dried up, banks faced unexpected exposures on their liquidity lines, on some of which they had to renege. This triggered a run on money funds that held many of the problem structured assets. The run in turn put other banks at risk, led to a breakdown of interbank markets, and caused an economy-wide freeze in credit to private borrowers, including non-financial corporations.

This form of securitisation has been largely inactive since the crisis. Once economic activity and private credit demand recover, some of this securitisation may resume. Securitisation will, however, most likely resemble itself as it was in the 1980s: subdued, with better recognition of risks, relying on more sophisticated investors.

Collateral intermediation

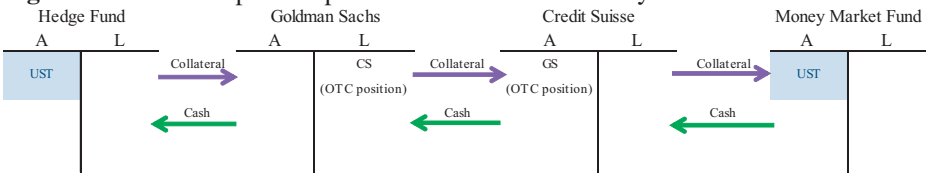
Another key function of shadow banking is supporting collateral-based operations within the financial system. Such operations include secured funding (of bank and, especially, non-bank investors), securities lending, and hedging (including with OTC derivatives). Collateral helps deal with counterpart risks and more generally greases financial intermediation. One of the main challenges in using collateral is its scarcity. The shadow banking system deals with the scarcity through an intensive re-use of collateral, so that it can support as large as possible a volume of financial transactions. The multiplier of the volume of transactions to the volume of collateral (the 'velocity' of collateral) was recently about 2.5 to 3 (see Singh 2011).

A small number of dealer banks, all 'systemically important financial institutions' (i.e. banks whose failure could trigger a global financial crisis) are uniquely placed in their ability to facilitate collateral-based operations.[1] The dealer banks derive comparative advantages from economies of scale and network centrality effects, and (undesirably) from the perceptions of very low counterparty risks thanks to being too big to fail.

The best way to describe the re-use of collateral is to visualise it in chains (Singh and Aitken 2010). Dealer banks source collateral from parties that require funding (such as hedge funds), or from agents that want to enhance return by 'renting out' assets as collateral (insurers, pension funds, and sovereign wealth funds acting through custodians). Then, collateral is pledged to other parties to obtain funding or support other contracts. This starts a system of repeated re-use of collateral where a single unit can support multiple transactions (Figure 2).

1 The main dealer banks are Goldman Sachs, Morgan Stanley, JP Morgan, Bank of America-Merrill Lynch, and Citibank in the United States; and Barclays, BNP Paribas, Crédit Suisse, Deutsche Bank, HSBC, Royal Bank of Scotland, Société Générale, Nomura, and UBS. All are classified as SIFIs by the FSB.

Figure 2 An example of repeated use of collateral in a dynamic chain



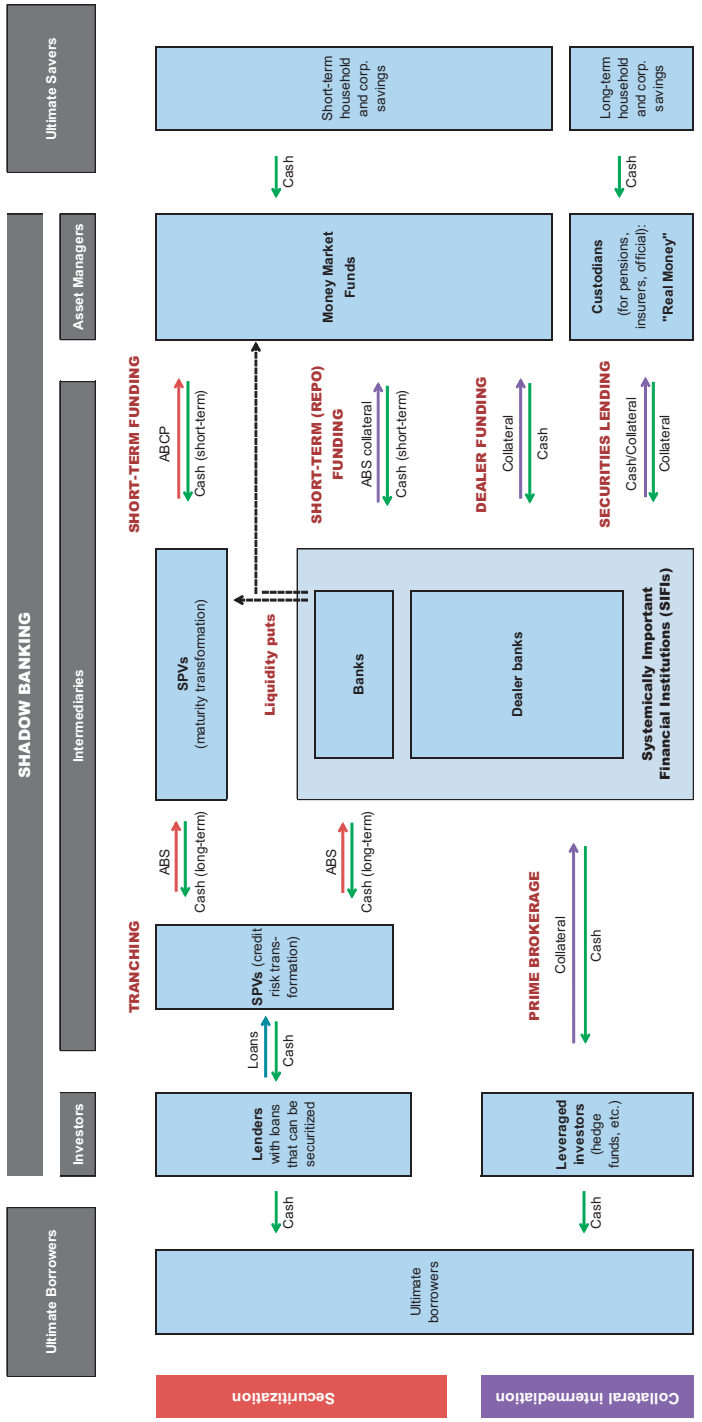
Note: The over-the-counter (OTC) positions are in parentheses since they are off-balance-sheet items. UST = US Treasury bond; GS = Goldman Sachs; CS = Credit Suisse.

While facilitating the effective use of scarce collateral, collateral chains are associated with systemic risks and other distortions. Dealer banks are exposed to significant liquidity and credit risks (Duffie 2010), creating financial stability risks. Being systemically important financial institutions, they also benefit from cheap funding, which implicitly subsidises shadow banking. Additional implicit subsidies are obtained through the qualified financial contract status for derivatives and 'repos' that prioritises them in bankruptcy at expense of other creditors (Perotti 2010). A distinct part of the collateral intermediation process, the tri-party 'repo' market presents its own, and very significant set of systemic risks (Tarullo 2012).

The overall view

Shadow banking is a complex ecosystem. It combines multiple nonbank agents, is linked to traditional banks, and extensively uses the services of dealer banks. It is useful to visualise the shadow banking system, as in the Figure 3.

Figure 3 Financial intermediation through the shadow banking system



Notes: ABS = asset-backed securities; ABCP = asset-backed commercial paper; SPV = special-purpose vehicle. Full-size image available here.

Policy recommendations

The analysis of demand factors and regulatory weaknesses driving shadow banking helps clarify policy recommendations. Some parts of the shadow banking system are fragile and can pose systemic risks, yet commonly lack appropriate regulation. The most pressing concerns here are addressing risks in dealer banks, money market funds, and the tri-party 'repo' market; these are the focus of the recent Financial Stability Board proposals (FSB 2012). Spillovers from the shadow to the traditional banking, and the possibility of banks using shadow banking for regulatory arbitrage also have to be addressed.

The crisis showed that demand-side pressures can lead to the creation of privately provided safe assets, but these assets are unstable. Some proposals therefore suggest limiting the volume of shadow banking activities or integrating shadow banking in the main banking system. A more realistic proposal is to explicitly acknowledge the demand-side pressures by accommodating a shortage of safe and liquid assets with publicly guaranteed short-term debt.

It is also essential to consider broader macroeconomic issues surrounding shadow banking. Shadow banking is highly procyclical: secured lending and repos rely on mark-to-market prices and margins/'haircuts' that adjust over the financial cycle; securitisation produces claims that are inherently exposed to 'tail risk'. Shadow banking is also hard to resolve in times of distress, since it encompasses many agents with complex contractual links. Shadow banking is also likely to have important interactions with monetary policy, both affecting interest rate transmission and being affected (e.g. in determining risk-taking) by prevailing interest rates. These issues raise specific sets of policies.

Addressing policy issues in shadow banking is a complex task. Research is yet to catch up. Some outstanding analytical issues include better differentiating economically-useful shadow banking activities from regulatory arbitrage. If we can better understand

the economic value of useful activities, we can get cost-benefit insights for better regulation. Regardless, a policy response to address evident systemic risks is necessary and urgent. Such response, if effective, will probably make the shadow banking system smaller in size but still able to perform its useful economic functions in much safer ways.

Editors' note: The views expressed here are those of the authors and do not necessarily represent those of the institutions with which they are affiliated.

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4.4 The fallacy of moving the over-the-counter derivatives market to central counterparties

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Regulators around the world are looking to regulate derivatives. This chapter argues, however, that current proposals for centralised counterparties are misguided. Instead of reducing risk in the notorious over-the-counter derivatives markets, they may simply shift it around. It calls for a tax on the derivative liabilities of large banks to tackle the problem at its source.

Big moves are afoot when it comes to regulating derivatives trade. G20 leaders, among others, were unhappy with the lack of transparency in the massive customised derivatives market (these are known as 'over-the-counter' or OTC derivatives – a name that evokes the distinction between over-the-counter drugs and those that require a doctor's prescription). OTC derivatives are typically a contract struck bilaterally between a financial intermediary (banks, etc.) and a particular investor. Perhaps the leading reform is a drive to move OTC derivatives on to more market-like settings with a central counterparty. According to BIS surveys, notional amounts for all categories of OTC contracts currently stand at around $600 trillion (BIS 2011).

- Since the Lehman bankruptcy and AIG bailout in the autumn of 2008, there has been increased momentum to move OTC derivatives from the books of the large banks to central counterparties (which continue to be viewed as payment systems).

- This is a huge transition because it moves the derivatives risk outside the banking system.
- The central counterparties in-the-making will become new entities and should be viewed as 'derivative warehouses', or concentrated 'risk nodes' of global financial markets.

It is important to note that post-Lehman, little progress has been made on crisis resolution frameworks for unwinding large banks, let alone large non-banks and infrastructures like central counterparties.

All this means that the underlying economics of having more 'too-big-to-fail' entities needs to be thought through correctly if the move is to improve things.

Where the risk is now

Table 1 and Figure 1 show that each of the large banks active in the OTC derivatives market in recent years carries an average of $100 billion of derivative-related tail risk; this is the cost to the financial system from the failure of a large bank (measured via the bank's residual derivative liabilities).

Residual derivative liabilities are the appropriate metric to use when assessing the systemic risk that large banks impose on other derivative users in the financial system. By "residual", we mean after all possible allowable netting has been done within the OTC derivatives book and after the (limited) collateral posted on the contracts has been subtracted. Thus, residual risk captures the shortfall of collateral stemming from large banks not posting their share of collateral to their clients.

Earlier research finds that the 10-15 largest players in the OTC derivatives market may have about $1.5 trillion in under-collateralised derivatives payables (Oliver Wyman 2011; Singh 2010).

The proposed regulations

A single, central counterparty with an adequate, multicurrency, central-bank liquidity backstop that would be well regulated and spans the broadest range of derivatives would have been an ideal 'first-best' solution.

- In view of the political realities (and subtleties of market organisation), a 'second-best' solution from an exposure, netting, and collateral standpoint would limit regulations to a few central counterparties rather than a proliferation of central counterparties.
- Recent developments suggest a significant departure from the envisaged first-best solution.

In fact, there will be a plethora of central counterparties since many jurisdictions (such as Australia, Canada, etc.) do not want to lose oversight of their local currency derivative products to an offshore central counterparty.

- Furthermore, the proposed regulations are likely to exempt end-users.

They may also exempt foreign-exchange swaps from moving to central counterparties. Large banks are likely to keep some non-standard OTC derivatives on their books due to netting benefits across products and also because central counterparties may not be in a position to clear all OTC derivatives.

Such exemptions will not only dilute the intended objectives of moving all or most OTC derivatives to central counterparties, but will increase the overall collateral requirements due to fragmented netting in the market.

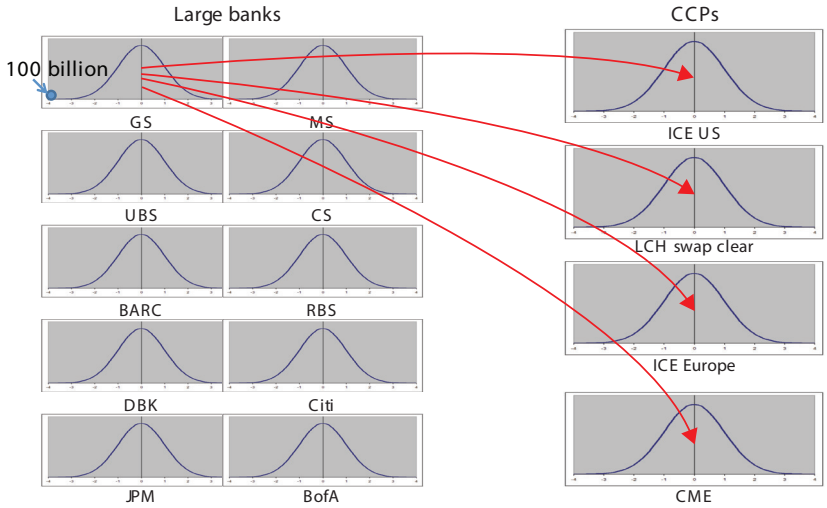
We are not moving the status quo of 10-15 large banks (or 'pockets' of risk) to one global pocket (which would maximise netting); we are moving towards something like 20-30 pockets of risk that include large banks and CCPs.

In short, the bottom line is that the world may be moving part way to the first-best solution. Basic economics tells us that such partial reform can make things worse.

Table 1 Derivative liabilities at a large bank (as shown in their financial statements)

	March 2009	
	Derivative assets	Derivative liabilities
	(in $ millions)	
Derivative contracts for trading activities		
Interest rates	1,171,827	1,120,430
Credit	469,118	427,020
Currencies	92,846	85,612
Commodities	80,275	77,327
Equities	100,291	92,612
Subtotal	1,914,357	1,803,001
Derivative contracts accounted for as hedges under SFAS No. 133		
Interest rates	24,347	1
Currencies	50	31
Subtotal	24,397	32
Gross fair value of derivative contracts	1,938,754	1,803,033
Counterparty netting	(1,685,348)	(1,685,348)
Cash collateral netting	(149,081)	(27,065)
Fair value including in "Trading assets, at fair value"	104,325	
Fair value including in "Trading liabilities, at fair value"		90,620

Figure 1 Proposed regulations will offload OTC derivatives from large banks to central counterparties (CCPs)



There are several drawbacks associated with central counterparties; we explain a few below:

- A central counterparty may also need central bank support if it has suffered a series of member defaults and is subject to a run because of credit concerns. In this case, the central bank providing *liquidity* support will be taking *credit/solvency* risk on whatever the net central counterparty position is. The line between liquidity and solvency is blurred, at best. In the most extreme scenario, where a temporary liquidity shortfall at a central counterparty has the potential to cause systemic disruption or even threaten the solvency of a central counterparty, it is likely that central banks in major jurisdictions will stand ready to give whatever support is necessary (and recent regulatory proposals suggest that the Fed and ECB will do so). However, such an arrangement creates moral hazard – and a roundabout way for derivatives risk to be picked up by taxpayers.
- Legal and regulatory constraints indicate that cross-border margin access is subordinate to national bankruptcy laws (such as Chapter 11 in the US). Thus, it is unlikely that central counterparty A in a country would be allowed access to collateral

posted by central counterparty B registered in another country. Thus, London Clearing House (LCH – a UK entity) now offers US clients clearing within US laws, so that US clients' margins do not have to be posted to LCH UK (where the local UK creditors would be senior to US clients). One way interoperability (or linking central counterparties) may work is if each central counterparty increases its default fund as a function of its open positions with the other central counterparties with which it will interoperate. This may get around the cross-border complexities associated with collateral being trapped in a defaulted central counterparties. However, linking central counterparties via augmented default funds will significantly increase the already sizable collateral needed to move OTC derivatives to central counterparties. Also – aside from legal and collateral constraints – the key central counterparties in the OTC derivatives market have established niche franchises that do not encourage interoperability.

- Collateral is presently fungible (i.e. collateral coming in via a derivative asset or receivable can be used to pay for a derivative liability or payable, see Singh 2010). In a central counterparty world, a decrease in the re-use of collateral may be significant, since there is increasing demand from some large banks and/or their clients (asset managers, hedge funds, etc.), for a 'legally segregated' margin that they will post to central counterparties. Also, the recent requests for bankruptcy remote structures – another form of collateral segregation – stems from the desire to not post collateral with offshore central counterparties. The MF Global saga will result in increased demand for segregation, so the re-use/churning of collateral within the OTC derivatives market will fall further (Singh 2011b).

Alternative proposal

Present market practices result in residual derivatives liabilities and residual derivative assets because aside from large banks, sovereigns, AAA insurers, large corporate, multilateral institutions (e.g. EBRD), Fannie, Freddie, and the 'Berkshire Hathaway' types of firms do not post their full share of collateral. They are viewed by large banks

as privileged and (presumably) safe clients. We thus suggest a tax, or a levy on residual derivative liabilities to be a more transparent approach than moving OTC derivatives to central counterparties, especially if the costs of bailing out central counterparties are to be funded by taxpayers (Singh 2011a). If a levy is punitive enough, then large banks will strive to make derivative liabilities reach zero; as a result, there will be no systemic risk via the OTC derivatives markets if a large bank fails.

Furthermore, as a by-product of the above levy, we would also address the residual derivative assets (that have also averaged $100 billion per large bank in recent years). This will happen since the large banks typically have matched books (i.e. the size of the derivative liability and asset positions at each bank is, on average, roughly the same).

Since, at the time of inception of the OTC derivative contract, we do not know if the contract will be in-the-money (asset) or out-of-the money (liability), the levy on liabilities will force receiving/paying collateral with every client (i.e., no free riding for anyone). Thus, derivative assets will also go to zero. From a risk-management angle, large banks need to hedge their 'in-the-money' positions, or derivative receivables, when there is a likelihood that these positions may not be paid in full. For example, hedging derivative receivables due from a sovereign pushes up the credit default swap (CDS) spreads on the sovereign, as seen in peripheral Europe in the past year or so. This, in turn, inflates the sovereign's debt issuance costs (since CDS spreads impact the spreads of the underlying bonds). Thus, addressing the under-collateralisation issues results in other synergies that are not being considered in the central counterparty CCP discussions.

Conclusions

In summary, placing a levy on derivative payables would be a better alternative, as it addresses the 'original sin' (i.e. some derivative users not posting their share of collateral) and also lower CDS spreads from spiralling during distress.

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4.5 The need for special resolution regimes for financial institutions

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7 January 2010

The global financial crisis forced governments facing failing financial institutions to choose between disorderly bankruptcies and costly injections of public funds. This chapter argues that special resolution regimes are a better alternative. It analyses their structure and function and argues EU member states ought to introduce and strengthen such regimes.

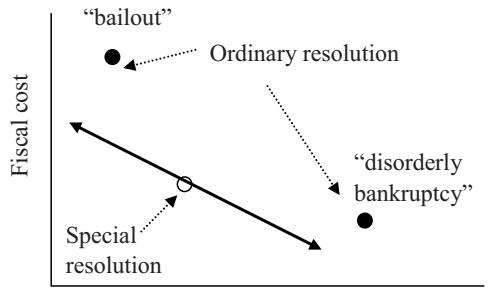
The recent financial crisis made evident the absence or inadequate scope of resolution tools to deal with failing financial institutions across the globe. Authorities were often confined to two alternatives:

- Corporate bankruptcy, as chosen for instance by the US authorities in the case of Lehman Brothers, a global financial-services firm; and
- An injection of public funds, as chosen by the US authorities in the case of AIG.

Events have shown that both these options can be very costly. A disorderly bankruptcy (as in the case of Lehman Brothers) can magnify the systemic impacts of the failure of a financial institution. When the authorities aim to avoid these impacts by injecting capital to support the institution (as in the case of AIG, or in the German cases of Hypo Real Estate and IKB), an open-ended commitment has been shown to require large fiscal outlays. A special resolution regime would allow authorities to avoid the choice

between 'disorderly bankruptcy' and an 'injection of public funds', thus improving efficiency by containing both fiscal costs and systemic impact.

Figure 1 Fiscal cost and systemic impact in resolution regimes



Indeed, for example, the efficient solution may involve a sale of the institution to another financial institution as a going concern. However, existing shareholders – either large blockholders or the majority of small shareholders – may hold out and block the resolution option taken by the authorities. This is likely to happen whenever the resolution option involves a loss of value or a loss of control for existing shareholders. The cases of Fortis and HRE are examples in which shareholder control delayed or closed off the resolution path preferred by the authorities.

The absence of special resolution frameworks not only encumbers crisis management, it may also have longer-term effects on financial stability. When ordinary bankruptcy is viewed as too costly by the authorities, bankruptcy ceases to be a credible threat. But if public infusion of capital becomes the only tool, this is certain to create moral hazard and reduce the force of market discipline (Nier and Baumann 2006).

In Canada, Japan, and the US, special resolution regimes for banking firms have long been in place and have been used effectively by supervisory agencies in many cases. Recent proposals by the US Treasury Department envisage the extension of special resolution powers to non-bank financial groups of systemic importance. By contrast, in many European countries, bank resolution is based on the general insolvency law and is often administered by the courts, with bank-specific modifications varying widely

across countries. In response to the crisis experience, some EU countries are either in the process of reviewing (e.g. Germany) or have recently revised (e.g. the UK) the relevant legislation. In other countries, the obstacles to legal reform still loom large.

Revising national frameworks for the resolution of financial institutions may be in the interest of each member state and the EU as a whole. The absence of robust resolution frameworks increases the likelihood that national authorities will resort to propping up failing financial institutions. Such support may conflict with the general principle underlying Articles 92–94 of the Treaty of Rome that state aid distorts competition and runs counter to a common market. It will also tend to increase the total fiscal cost of crisis resolution in the region as a whole.

Principles and design of the framework

A consensus is beginning to emerge about the features that a special resolution framework should comprise. In particular, sound practice is for the framework to:

- Allow the banking authorities to take control of the financial institution at an early stage of its financial difficulties through "official administration";
- Empower the authorities to use a wide range of tools to deal with a failing financial institution, without the consent of shareholders or creditors;
- Establish an effective and specialised framework for liquidation of the institution that assigns a central role to the authorities and effectively protects depositors;
- Ensure clarity as to the objectives of the regime, including preserving financial stability, and the scope of judicial review; and
- Promote information sharing and coordination among all authorities involved in supervision and resolution.

Effective resolution needs to expand the set of tools available to authorities in the resolution phase beyond the 'default options' of liquidation and capital support. The following tools have been found particularly useful:

- Acquisition by a private-sector purchaser;
- A bridge bank (a temporary institution created by the resolution authority to take over the operation of the failing institution and preserve its going concern value);
- Partial transfer of deposits and assets to a "good bank"; and
- Temporary public control, as a last resort.

The resolution regime will need to specify a regulatory threshold, such that when the threshold is crossed, the resolution authority is entitled to take control of the firm and to use resolution tools at an early stage of financial difficulty when the institution may still have positive net worth. This can be a hard trigger, such as the breach of a specific regulatory ratio, but it might also be a soft trigger, enabling a number of considerations to inform the policy judgment.

The resolution framework needs to be consistent with the general considerations that govern the conditions under which personal property rights can be constrained by the authorities. This will in general require an overriding public policy objective, such as the preservation of financial stability. Judicial review of actions taken by the authorities should be clearly circumscribed and should not allow the court to reassess the exercise of discretion unless there is clear evidence of a manifest error of fact or an abuse of power. Where the relevant actions of the banking authorities inflict damage on a bank's owners without proper justification, the remedy can be in the form of monetary compensation. However, the legal framework should establish clear limits on the circumstances in which such damages may be awarded, and it should grant immunity for banking authority officials from liability for actions they have taken in good faith.

The introduction of special resolution regimes requires careful reflection of the appropriate scope of the regime. At a minimum, all deposit-taking institutions need to be within the scope of the regime. It may be desirable for the scope to be robust to a potential trend away from business models that involve funding through retail deposits and to apply more broadly to financial institutions that can pose a systemic risk, as per suitably defined criteria.

Cross-border issues

The introduction of special resolution regimes at the national level could be a useful element to help achieve a more effective resolution of financial institutions operating across European borders. By virtue of the Winding-Up Directive, resolution actions taken by authorities in accordance with their national (special) resolution framework have full legal force across the EU, in cases where the failing institutions has branches in other member states. When the failing institution has subsidiaries, this does not hold necessarily. Nonetheless, even in these cases, special resolution regimes are likely to have positive effect on the cross-border resolution, namely:

- An effective regime will tend to reduce the fiscal burden involved in resolution, making it more likely for national authorities to agree on sharing the burden.
- Special resolution regimes are likely to reduce difficulties associated with situations where the subsidiary is systemic in a host country, but the parent is not considered systemic in the home country. If a special resolution regime were in place that would provide the home authorities with the power to effect a forced sale of the institution, the home authorities could well judge that the cost of using this option is small relative to the cost of letting the institution fail, with benefits to the host economy.
- The 'bridge bank' is likely to be helpful as an interim solution in complicated cross-border cases, when negotiating a permanent solution may be time consuming.

National special resolution regimes may not be sufficient to fully address cross-border issues. They may need to be complemented by an EU-level special resolution regime for cross-border institutions. A resolution regime that applies at the fully consolidated level may come to be an element in a dedicated European regime for cross-border financial institutions (Čihák and Decressin 2007). While this is a useful medium-term goal, a realistic approach at the current stage is for the European authorities to encourage individual EU countries to introduce or strengthen their national frameworks, which are needed in any case.

Conclusion

Summarising our analysis, there is a strong case for banks and other systemically important financial institutions to be subject to a special resolution regime (Čihák and Nier 2009). Such regimes can contribute to overall financial stability by improving the trade-off between the need to stabilise the banking system and to minimise fiscal costs and longer run-costs of moral hazard. They can thus help restore incentives that are otherwise compromised by expectations of public support, 'too important to fail'.

Special resolution regimes are not, however, sufficient to guarantee financial stability. Successful financial stability frameworks rest instead on a range of interlocking measures, including special resolution regimes, as well as heightened prudential control of systemically important institutions (Nier 2009). Indeed, in the absence of special resolution tools, even relatively small institutions can pose a threat to financial stability, potentially requiring much tighter prudential controls of large parts of the financial system to achieve a given stability goal. When the objective is to ensure that the financial system is both stable and efficient, the introduction of special resolution regimes needs therefore be a key priority.

Editors' note: The views expressed here are those of the authors and not necessarily those of the IMF.

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Part V

Politics and governance

5.1 Lobbying and the financial crisis

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Should the political influence of large financial institutions take some blame for the financial crisis? This chapter presents evidence that financial institutions lobbying on mortgage lending and securitisation issues were adopting riskier lending strategies. This contributed to the deterioration in credit quality and to the build-up of risks prior to the crisis.

Should the political influence of large financial institutions take some blame for the financial crisis? In his speech at the 2010 annual meeting of the American Economic Association, Fed Chairman Ben Bernanke argued that, based on evidence of declining lending standards during the boom, "stronger regulation and supervision aimed at problems with underwriting practices and lenders' risk management would have been a more effective and surgical approach to constraining the housing bubble than a general increase in interest rates" (Bernanke 2010).

Why wasn't financial regulation tightened before the crisis?

If regulatory action would have been an effective response to deteriorating lending standards, why didn't the political process result in such an outcome? Questions about the political process, through which financial reforms are adopted, are very timely now that the US Congress is considering financial regulatory reform bills.

A recent study by Mian et al. (forthcoming) shows, for example, that constituent and special interests theories explain voting on key bills, such as the American Housing Rescue and Foreclosure Prevention Act of 2008 and the Emergency Economic Stabilization Act of 2008, that were passed as policy responses to the crisis.

A number of news articles have reported anecdotal evidence that, in the run up to the crisis, large financial institutions were strongly lobbying against certain proposed legal changes and prevented a tightening of regulations that might have contained reckless lending practices. For example, the *Wall Street Journal* reported on 31 December 2007 that Ameriquest Mortgage and Countrywide Financial spent millions of dollars in political donations, campaign contributions, and lobbying activities from 2002 through 2006 to defeat anti-predatory-lending legislation.

There has, however, been no careful statistical analysis backing claims that lobbying practices may have been related to lending standards. In a recent paper (Igan et al. 2009), we provide the first empirical analysis of the relationship between lobbying by US financial institutions and their lending behaviour in the run up to the crisis.

Data sources

Lobbyists in the US – often organised in special interest groups – can legally influence the policy formation process through two main channels.

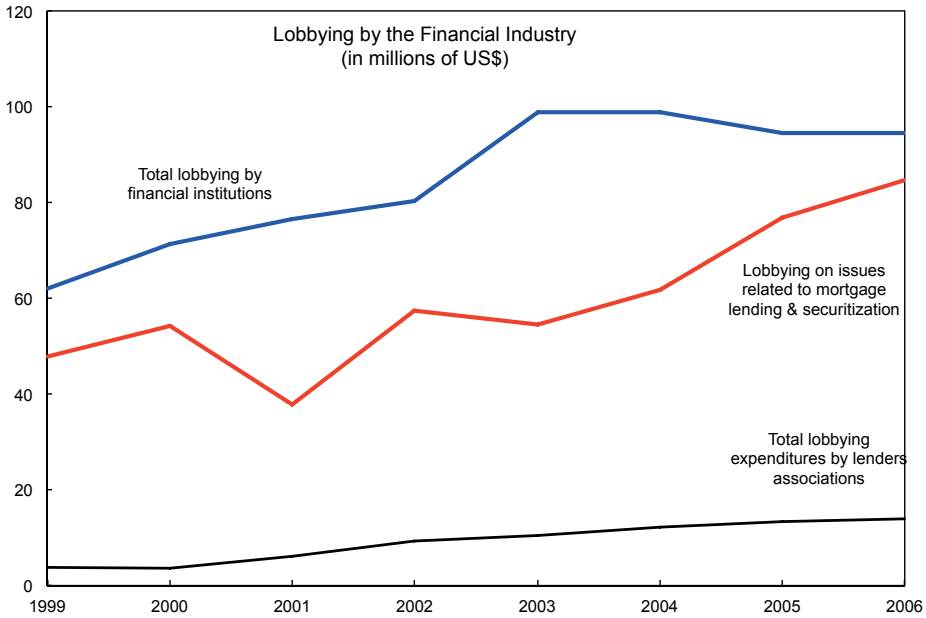
- First, they offer campaign finance contributions, in particular through political action committees.
- Second, they lobby members of Congress and federal agencies about specific legislation.

In contrast to campaign contributions, these lobbying activities – which account for about 90% of expenditures on targeted political activity – have received scant attention in the academic literature.

The Lobbying Disclosure Act of 1995 requires lobbying firms and companies with in-house lobbying units to file reports of their lobbying expenditures with the Secretary of the Senate and the Clerk of the House of Representatives. Legislation requires the disclosure not only of the dollar amounts actually spent, but also the issues in relation to which the lobbying is carried out.

By going through individual lobbying reports, we identify all lobbying activities by financial institutions related to the regulation of mortgage lending and securitisation. During the period of the boom from 2000 to 2006, we find 16 pieces of federal legislation aimed at enhancing the regulation of predatory lending practices, none of which ever became law. The amounts spent on lobbying in relation to these laws were substantial and were spent mostly by large financial institutions.

Figure 1 Lobbying in the financial industry (US$ millions)



The striking picture is that financial institutions lobbying on specific issues related to mortgage lending and securitisation adopted significantly riskier mortgage lending strategies in the run-up to the crisis.

We considered three measures of ex-ante loan characteristics: the loan-to-income ratio of mortgages, the proportion of mortgages securitised, and the growth rate of loans originated. The loan-to-income ratio measures whether a borrower can afford repaying a loan; as mortgage payments increase in proportion of income, servicing the loan becomes more difficult, and the probability of default increases. Recourse to securitisation is often considered to weaken monitoring incentives; hence, a higher proportion of mortgages securitised can be associated with lower credit standards. Fast expansion of credit could be associated with low lending standards if, for example, competitive pressures compel lenders to loosen lending standards in order to preserve market shares.

We find that, between 2000 and 2006, the lenders that lobbied most intensively to prevent a tightening of laws and regulations related to mortgage lending also:

- Originated mortgages with higher loan-to-income ratios;
- Increased their recourse to securitisation more rapidly than other lenders; and
- Had faster-growing mortgage-loan portfolios.

These findings suggest that lobbying by financial institutions was a factor contributing to the deterioration in credit quality and contributed to the build-up of risks prior to the crisis.

Further results

Our study offers two pieces of evidence showing that lobbying lenders experienced worse performance once the financial crisis started.

- First, delinquency rates in 2008 were significantly higher in areas where mortgage lending by lobbying lenders had expanded relatively faster than mortgage lending by other lenders.
- Second, these lobbying lenders experienced negative abnormal returns around the

key events of the crisis (such as the collapse of Lehman Brothers).

All in all, this evidence suggests that these lenders had larger exposures to poorly performing mortgage loan pools.

Conclusions and policy implications

What are the implications of these findings for policy making?

- Should lobbying be banned altogether because it is driven by rent-seeking?
- Is lobbying symptomatic of other underlying problems?
- Is lobbying, on the contrary, a channel through which lenders share their private information with policymakers?

With the benefit of hindsight, it seems reasonable to argue that lobbying by financial institutions can contribute to risk accumulation and threaten the stability of the financial system. Drawing precise policy implications, however, may not be straightforward, and would depend on the motives behind lobbying and lending practices.

Financial institutions may lobby to obtain private benefits, such as decreased scrutiny by bank supervisors, or higher likelihood of a bailout, and potentially under less stringent conditions. Under such rent-seeking motivations, lobbying is socially undesirable, all the more so as it contributes to financial instability. It should therefore be tightly regulated.

Lobbying may also reflect distorted short-term incentives within financial institutions; the perspective of high short-term gains may motivate both risk taking and lobbying. In this case, tackling the underlying distortion – by aligning managers' compensation with long-term profit maximisation – may be a more efficient way to limit excessive risk-taking than preventing lobbying.

More optimistically, financial institutions may also lobby to reveal superior information on the mortgage lending market and gain support for innovation in financial services.

In this view, lobbying serves a social purpose, and there may be better ways to contain risks than simply challenge lobbying.

The ongoing legislative efforts to enhance banking supervision and regulation in the US provide another context to further our understanding of the motivation for lobbying by the financial sector. Recent reports show that financial institutions intensified their lobbying efforts in 2009 to fight against an overhaul of derivatives regulation and legislation. Johnson (2009) argues that substantial reform will fail unless the political power of the finance industry is weakened. Further work will be needed to ascertain whether this will be the case.

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5.2 Tax banks to discourage systemic-risk creation, not to fund bailouts

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07 February 2010

Obama's plans for bank taxation took markets, policymakers, and academics by surprise, leaving all parties now debating its merits. This chapter suggests an alternative. By raising a Pigouvian tax based on banks' individual contribution to systemic-risk creation, the policy would target the externality caused by funding fragility while raising the cost of opportunistic risk creation in good times.

The burning issue of funding the bailout has finally led to the first policy action on financial taxation. The good news is that it is not a Tobin tax on all financial transactions, which would be a very crude and distortionary solution. Financial intermediaries have indeed grown too large, but discouraging all financial transactions suppresses activity and fails to target problematic practices.

The Obama proposal for bank taxation has simple flat rates on uninsured bank liabilities. This is a better target than total liabilities since deposits were already insured, and the intervention bailed out wholesale funding.

But is such a flat tax designed to control risk creation? John Kay (2010) argues against it. Meanwhile Viral Acharya and Mathew Richardson (2010) argue that the bailouts have generated more moral hazard and suggest a fee discouraging all activity that

creates systemic risk – not just leverage – and moreover that banks should be paying more in the good times when risk-taking is more attractive.

In recent research, Javier Suarez and I (2009a,b) suggested a more subtle policy than President Obama's – a Pigouvian tax based on banks' individual contribution to systemic-risk creation, measured by their exposure to uninsured short-term funding. As in the Obama tax, this approach exempts insured deposits and targets the risk of sudden withdrawals of wholesale funding, which was the engine of the last crisis. Critically, our tax is sharper for shorter-term funding and decreases to zero for medium-term liabilities that do bear risk. In other words, it targets the externality caused by funding fragility and offers strong incentive effects in good times.

Liquidity charges are complementary to countercyclical capital requirements. Higher capital ratios will control asset risk and improve risk absorption, but they would not stop systemic propagation during a panic. When losses lead to rapid withdrawals of massive amounts of uninsured funding, they spread to other markets by forcing fire sales, which in turn trigger more frantic deleveraging.

Liquidity charges contain risk without relying exclusively on restrictions on admissible investments. It would discourage banks from running large proprietary trading with cheap short-term funding – and in particular from playing a simple carry trade that adds little value to economic activity. Importantly, it would charge intermediaries in good times, raising the cost of opportunistic risk creation when intermediaries grow quickly with unstable short-term funding for investing in risky assets.

Unlike capital requirements, liquidity charges raise revenues. A fraction should go to general tax revenues, because bank instability hurts the whole economy, a part may flow into a bank stability fund.

Finally, liquidity charges (in excess of a basic tax) are a natural macro-prudential tool. Because central banks and supervisors serve the two goals of monetary and financial stability, an instrument distinct from interest rate policy is needed for financial stability.

Raising the interest rate is too blunt, as it hurts the whole economy and is therefore used too sparingly. Under our proposal, macro-prudential authorities would be able to adjust tax rates (or surcharges) to slow down rapid credit creation and risk accumulation in a timely fashion. The best discipline for timely intervention is the attribution of a distinct tool and associated responsibility to a coordinating entity such as the European Systemic Risk Board.

The effect of liquidity charges would be to induce the financial system to rely less on unstable short-term funding and create an opportunity cost for simple carry trade strategy of funding high yield risky position with cheap but fleeting borrowing. Proprietary trading that adds no value would be discouraged (not just for banks) without forcing a generalised prohibition.

There is really no reason why so much of the financial intermediation is funded with near-demandable debt that does not correspond to retail depositor needs. In the crisis, short-term investors which were unwisely supporting risky strategies were able to escape in time. We need to do less ex post insurance and more ex ante discouraging. Yet it is important to do using well targeted taxes, not just draconian market segmentation and quantity regulation.

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5.3 Saving the banks, but not reckless bankers

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How to save the banks but not the bankers? This chapter argues that fines for criminal behaviour in banks are not enough – it may be time to start locking people up.

Recent revelations on traders' behaviour in the Libor rigging case are worrisome not only as a sign of the rotten culture of financial operators, but also for the sense of legal impunity prevailing among them (*Economist* 2012). They suggest that bank CEOs and supervisors may have tolerated or encouraged rate rigging, or negligently lost control of banks' operations, for years. They also indicate that law enforcement has been extremely weak in the realm of banking and finance. The recent allegations that some large UK banks have been involved in extensive money-laundering activities in favour of Mexican drug cartels and Iran reinforce this impression considerably.

In the light of these revelations, on 25 July 2013 the European Commission amended its proposal for a Regulation and a Directive on insider dealing and market manipulation to include criminal sanctions against that type of price fixing. Meanwhile, following a report by the FSA on the failure of the Royal Bank of Scotland, the UK Treasury had already opened a consultation on how to introduce criminal sanctions against failed banks' directors, ranging from automatic debarment to full fledged prison for extreme reckless behaviour.[1]

1 See here.

The need for tougher sanctions is self-evident, as is the need to hold accountable negligent regulators. But are *criminal* sanctions a good remedy for financial misbehaviour? Wouldn't it be better to substantially increase monetary fines? The question is warranted given that, with few exceptions, modern economists from Becker (1968) onwards regard monetary fines as a more efficient law enforcement instrument than non-monetary criminal sanctions (Polinski and Shavell 2000, Werder and Simon 1986).

The problem with monetary fines is that not always *can* wrongdoers be fined at a sufficient level to achieve deterrence. Wrongdoers may:

- Not have sufficient wealth, or may conceal it;
- Transfer fines to other parties (uninformed shareholders, directors' insurance funds, etc.); or
- Be protected by limited liability (for corporate fines).[2]

In the remainder of this chapter, I will try to clarify why these problems are particularly acute for banks and in particular for bankers, intended as those individuals with inside information and control on the banks' business (traders, directors, CEOs…). As we will see, the same reasons that for a long time have made banks 'special' for competition policy also ensure that to deter bankers' wrongdoing, non-monetary criminal sanctions are necessary.[3]

First allow me to note that I cannot be suspected of favouring criminal sanctions in general. Some years ago, when the European Commission considered the introduction of criminal sanctions in antitrust (Wils 2006; Cseres et al. 2006), I argued against that.

2 For example, US taxi companies seem to have strategically overborrowed to reduce their own liability for damages from car accidents; see e.g. Che and Spier (2008) and the literature therein.

3 Although recently published e-mail exchanges related to the HSCB money-laundering scandal involving bloody Mexican drug cartels make this need somewhat obvious. When challenged by the central compliance office, after the DoJ caught them, the responsible bankers apparently complained: "We didn't go to jail! We merely signed a settlement with the Feds for $10 million!" See for example here.

The potential for high corporate fines, combined with leniency programmes that give amnesty to the first conspirator that collaborates – introduced in the last decades in antitrust – appeared far from being fully exploited in the EU. Antitrust fines were – and many think still are[4] – too low to achieve cartel deterrence. We therefore suggested trying first to substantially increase antitrust fines, even at levels that could lead wrongdoing firms into financial distress. Selling a failing firm to new independent owners may be the best way to ensure it will change its course of action (see Buccirossi and Spagnolo 2006, 2007 for detailed discussions and some simulations).

For banks, however, this would not work. Banks are considered special because governments associate large, profitable banks with financial stability. For this reason, corporate fines on banks cannot be increased enough to discipline bankers. Fines of a sufficient size would weaken banks' balance sheets, which is something nobody wants. The risk of destabilising banks will then either induce governments to keep fines low (something courts already do with non-financial firms in weak financial situations (Craycraft et al. 1997)), or it will increase the likelihood that part of the fine will be paid by taxpayers through a higher risk of bailout or subsidised liquidity and deposit insurance.

Individual fines on wrongdoing bankers may help, but they are also unlikely to suffice:

- They can at least partly be hedged in the market and through directors' insurance.
- The less honest bankers (the individuals we want to deter more) are also often specialists in transferring and hiding money; they will likely react to large individual fines by transferring or hiding their wealth.
- Companies typically indemnify executives (reimburse their fines) if they acted to increase company profits. Therefore individual monetary fines are also likely to be at least partly transferred on uninformed shareholders and taxpayers.

4 See for example here.

For all these reasons, fines must be accompanied by individual non-monetary criminal sanctions on wrongdoing bankers.

It would also help if well-designed and well-run leniency programmes (as present in antitrust) and whistleblower reward/protection schemes could accompany criminal sanctions. Indeed, most evidence on financial and corporate misbehaviour comes from whistleblowers, or from settlements in which lenient treatment is traded against important information.[5] Recent research shows that leniency in exchange for cooperation works well if it is limited to the first cooperating wrongdoer and either (a) large rewards are paid out to whistleblowers (Bigoni et al. 2012a), or (b) sanctions are sufficiently tough to make people afraid of being betrayed by fellow wrongdoers (Bigoni et al. 2012b).

To wrap up, our discussion suggests that:

1. Non-monetary criminal sanctions for individual misbehaving bankers are necessary.
2. Settlements involving only monetary payments from the banks, but no fines nor other criminal sanctions on the wrongdoing bankers, should be avoided. Such settlements should only be admitted if the information obtained in exchange are crucial to charge criminal sanctions against other wrongdoers, as in antitrust leniency programmes.

In the US, criminal sanctions are already present, also in antitrust, and will likely be used to send some of the Libor-rigging traders, and hopefully their negligent (or accomplice?) bosses, to jail. The US also introduced an amendment of the Dodd-Frank Act in 2011 that allows regulators to reward whistleblowers that denounce financial misbehaviour at the cost of their career. This is promising – let's see how it will be administered.

5 This is a reason to blame banks that did not cooperate with authorities, like RBS which is controlled by the UK Treasury denied regulators some requested documentation, much more than Barclays, who at least chose to cooperate with law enforcers (although not entirely voluntarily).

In the EU there seems to be no intention to introduce effective leniency and whistleblower reward schemes. There is therefore only one option open: steeply increasing sanctions, including non-monetary criminal sanctions (debarment from the industry, and jail in worse cases) that are harder to hedge or transfer.

Criminal sanctions might even help with the Eurozone crisis. Suppose CEOs and directors of the Spanish banks in need of rescue could be fined individually and debarred from working again in the financial sector as a condition to access to the EU rescue plan. Isn't it likely that the open complaint by 172 German economists against Angela Merkel's willingness to save the Spanish bankers together with the Spanish banks would be withdrawn? After all, it is not Spanish banks that need to be held accountable, but the reckless Spanish bankers that continued to cash bonuses betting other people's money on an obvious housing bubble that only bank-sponsored 'experts' could find the 'courage' to deny.

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Everybody seemed to be caught off guard by the Global Financial Crisis that started in 2007, not least the financial regulators. They missed all the excessive risk-taking, the build-up of financial imbalances and the accumulation of vulnerabilities in the years and decades before the Crisis. What went wrong and how can we fix it?

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