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REGULATORY REFORM, STABILITY, and CENTRAL BANKING

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Introduction

The crisis that broke in 2007 and brought the international financial system to its knees in late 2008, threatening a repeat of the Great Depression, left the credibility of financial regulation and supervision in tatters. Until this is repaired, confidence in the financial system itself will remain fragile.

Of course there were plenty of other factors behind the crisis: a badly unbalanced global economy, with much of the West owing too much to the high-saving economies of the East; a rampant search for yield associated with declining global real interest rates and persistently easy monetary conditions; myopia about risk; soporific reliance on highly liquid markets; herding, on the way up as well as, later, to the exit; moral hazard from a perceived and, as it turned out, available taxpayer safety net; and a legion of agency problems in banks and investment managers.

Those agency problems were serious, with no one stopping dealers and banks expanding their balance sheets to maintain, or increase, leverage as rising asset prices inflated the value of their equity.[1] Others—in all types of banking, and throughout the West—gradually adopted copy-cat strategies under pressure from their boards and stockholders. Risk was underpriced. The resulting credit boom left many borrowers over-indebted and assets overvalued.

But the crisis would not have been as deep, nor its economic effects so long lasting, if the core of the financial system had not been fatally weak. Economies can survive over-valued property markets and overly indebted borrowers if their financial systems can weather the losses and so maintain the supply of credit. They couldn't.

Key money markets dried up. So few banks held reliably liquid assets, so many were excessively reliant on skittish short-term funding, so many had promised liquidity insurance to off-balance sheet vehicles that found their market funding cut off, that central banks were acting as lenders of last resort (LOLR) from mid-2007—before anything much had happened in the real world.

Even though the liquidity fragility inherent in the mismatch between short-term liabilities and longer-term assets was the very point of regulating banking in the first place, it should have been remarkable that the whole system could be pushed over the edge by small losses originating in the U.S. subprime mortgage market. Opacity created uncertainty about which securities were tarnished, and who held damaged portfolios. A complex network of credit exposures amongst banks and other financial institutions prompted concerns that, at least indirectly, pretty well everybody was exposed. But surely the fatal fault line was the woeful undercapitalisation of the banks (and their "shadow banking" cousins), tipping some over the edge as the storm broke and, crucially for the economy, leaving the banking system incapable of re-intermediating the provision of credit as capital markets closed. Although undoubtedly exacerbated by the liquidity crisis that began in 2007, too many firms were unsound to begin with.

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While borrowers and lenders were responsible for their own imprudence, responsibility for the stability of the system as a whole lay squarely with the authorities. This was a failure of prudential supervision and regulation on a grand scale—on both sides of the Atlantic. The authorities had been blind to the buildup of banking-type risks—leverage and maturity transformation—outside of de jure banks. And to pile on the agony, they failed to see that the banking system

[1] See Adrian and Shin (2010). They study a process working through the marking-to-market of assets, but other mechanisms involved gearing up with term debt on the back of unusually profitable commercial banking operations; increasing risk exposures as value-at-risk measures fell due to declining volatility; and heavy use of securitisation as an apparently cheap funding source (e.g., Northern Rock in the United Kingdom). Each instance combines misperceptions of the durability of unusual market conditions, myopia about tail risk, and weak incentives to wake up.

needed heightened resilience given global macroeconomic imbalances, unusually low risk-free real interest rates and elevated asset values, compressed risk premia in credit markets, and accumulating household debt. The macro-financial feedbacks were more vicious in the bust for having been ignored in the boom.

Cross-border contagion was rife. Notwithstanding well-documented lessons from the1990s Asian crisis, the pattern of gross capital flows and the consequent structure of external liabilities and claims (the national balance sheet) were barely monitored, let alone managed.[2] A good example is Euro Area banks investing in risky U.S. securities, funded by flighty U.S. money market funds.

Perhaps worst of all, when the bust came no country had the technology to resolve large and complex financial institutions.[3] Although part of the problem was that the writ of the Federal Deposit Insurance Corporation (FDIC) did not then run to broker dealers or holding companies—a problem partly cured by Dodd-Frank—in fact the traditional "Purchase & Assumption" technique for separating firms into their critical and other parts would not remotely have coped with the failure of the more-complex commercial banks.[4] Elsewhere, it was much worse; the United Kingdom had no resolution regime at all. Realising this, the withdrawal of funding snowballed. The consequent taxpayer bailouts of 2008–2009 raised moral hazard to new heights.

A Core International Reform Programme

Although at times preoccupied with local reform debates, the capitals of the world's major economies confronted common issues in redrawing the rules of the road for finance. Combined with a shared desire to preserve open, global financial markets, this has meant the main reform action has been international—perhaps more so than is recognised here in the United States or in London. Overall, the test is whether the reforms can increase the resilience of the system as a whole, reduce contagion when trouble hits, and mitigate the pro-cyclicality of financial conditions.

> Policy on markets is somewhat less coherent, vigorous and joined-up, although arguably less immediately pressing.

Broadly, the *banking package* is coherent and well-conceived, seeking to address excess leverage, excess opacity, excess interconnectedness, excess maturity mismatches, as well as the biggest issue of all: too big to fail (TBTF; see FIGURE 1). The aim is to apply its key elements not only to de jure banks, but also to any important institutions that are leveraged and exposed to liquidity runs. Higher solvency requirements and a credible regime for resolving distressed firms will, taken together, both reduce the risk of panicky liquidity runs and, in the event that a run does occur, make it easier to restore order without a bailout.

This paper's evaluation begins, therefore, with the four core planks of the international reform effort,[5] which is broadly consistent with the Dodd-Frank legislation in the United States:

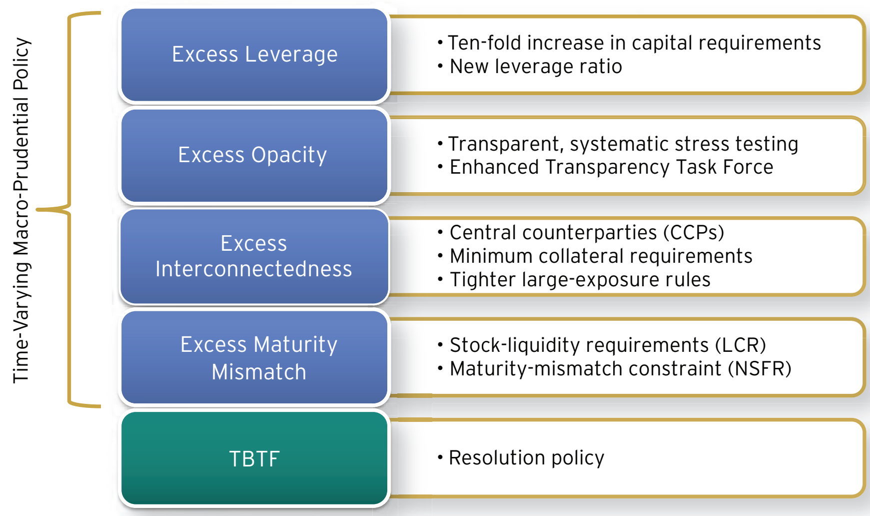
[2] This is extraordinary given the 2000 Report of the Financial Stability Forum Working Group on Capital Flows, which was presented to G-7 and G-20 Ministers (Financial Stability Forum 2000). It urged controlling vulnerabilities in national balance sheets, highlighting lessons from the Asian crisis about gross indebtedness in different sectors, not net current account imbalances. It did not get absorbed by macroeconomic policymakers, and it was too "macro" for regulators.

[3] This is despite a joint G-10/Financial Stability Forum (2001) report on the problems of winding down large and complex financial institutions (or LCFIs, as systemically important financial institutions [SIFIs] were then called). The report was not published at the time but was presented to Ministers.

[4] The standard technique for resolving a standard bank involves splitting off the insured-deposit book and transferring it to a healthy competitor. Broadly, other services are regarded as non-critical. That is not true for many big firms offering complex services.

[5] See, for example, the Financial Stability Board (FSB) chair's letter to G-20 leaders (FSB 2013d), September 2013.

FIGURE 1. Banking Reforms

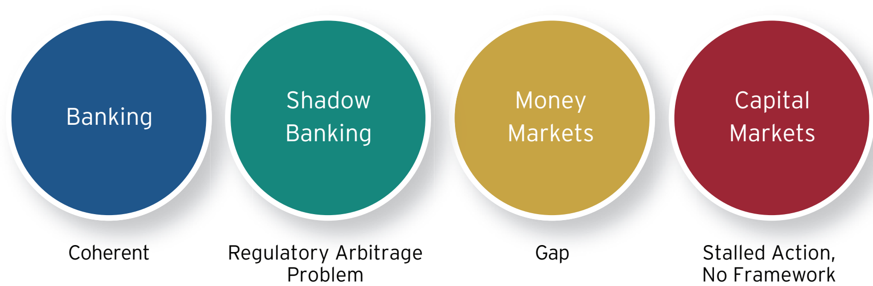


LCR = liquidity coverage ratio   NSFR = net stable funding ratio

- Strengthening the balance sheets of banks, and revitalising prudential supervision
- Ensuring that distress at any financial institution can be resolved in an orderly way without taxpayer *solvency* support, i.e., *no bailouts*
- Guarding against endemic regulatory arbitrage undermining those efforts, so that shadow banking is not left free to blow up the financial system at some point in the future
- Simplifying the network of counterparty credit exposures amongst banks and dealers, through mandated use of central counterparties (CCPs) for standard derivatives

The discussion of those reforms in the first section of this paper leaves hanging in the air some big questions about whether rewriting the social contract for banking is sufficient to preserve systemic stability; and, relatedly, whether it is enough to focus on institutions rather than also on markets or activities. This matters because policy on markets is somewhat less coherent, vigorous and joined-up, although arguably less immediately pressing. The second section examines those issues, and sketches a possible framework for markets policy, distinguishing between capital markets and money markets; the paper therefore identifies four overlapping but distinct policy spheres (FIGURE 2). The third section

FIGURE 2. Not Just about Banking (A Mistake to Focus Everything on SIFIs)



reviews the rebuilding of regulatory institutions. Given rules arbitrage, innovation and "cyclical" variations in credit conditions, it stresses a need for nimble and flexible regulation. It argues for broader objectives for securities regulators, and identifies challenges facing "macro-prudential" institutions. The paper concludes on a positive note with how some of the regulatory reforms can help to meet concerns raised about the legitimacy of central bank support operations.

I. The Safety and Soundness of Banks: From Micro- to Macro-Prudential Supervision and Regulation

Not banning maturity transformation and credit extension in banks is surely right. By combining the provision of demand deposits with committed lines of credit, banking delivers efficiency gains in the management of liquidity risk for households and firms;[6] otherwise, everybody would have to stockpile liquidity themselves all the time. But making banks self-insure by holding *some* reliably liquid assets that can be drawn down when needed has long been overdue. Also sensible is Basel's planned Net Stable Funding Requirement, which will constrain maturity mismatch by limiting the proportion of banks' assets that can be funded short term. Calibration is difficult given the state of knowledge, but these measures take some pressure off capital policy.

The best safeguard against liquidity panics is for funders and counterparties to see that banks hold adequate capital against their risks.

Even so, the best safeguard against liquidity panics is for funders and counterparties to see that banks hold adequate capital against their risks; resilient solvency is the best liquidity policy. The new Basel Accord is rightly focused on *equity* capital, with a requirement of around 10 percent for the biggest international banking groups—the so-called systemically important financial institutions (SIFIs). Some query whether that is enough. But it is an order of magnitude higher than the previous minimum of around 1 percent (as measured today[7]), and so would have dampened somewhat the excesses of the mid-2000s boom, as well as providing considerably greater cover against losses. Moreover, reforms are, I trust, on course to raise the equity cover for potentially illiquid trading positions, which is tremendously important in a world where sharp increases in liquidity premia on marked-to-market assets can drive a bank or dealer over the accountants' definition of solvency. Nevertheless, this minimum capital ratio would be insufficient on its own, so policymakers have a package that ranges from technical repairs, through a backstop and state-contingent macro-prudential variations in parameters, to an overhaul of resolution regimes.

If risk weights were driven wholly by banks' own models, the capital in the system could again end up being too low, reflecting banks' private interests rather than the wider needs of the economy. Supervisors plan to expose and reduce unwarranted variations in firms' risk models. More fundamentally, work is under way to simplify the framework. The solution should be common floors on risk weights—a regime somewhere between Basel II and the broad-brush constraints of the mid-1980s' Basel I.

Rather than rely on improving the integrity of risk-asset ratios, the 2009 London Summit decided to apply a cap to leverage, i.e., total assets/equity. It, too, would be insufficient on its own, inducing firms to move into high-risk businesses

6 See Kayshap, Rajan, and Stein (2002).

7 Equivalently, in "old money," the increase is to much more than10 percent. A key improvement in the Accord is the deduction from equity of more items, including goodwill and investments in insurance subsidiaries. This gets much closer to "free capital" that can absorb losses in a going concern, and affects measures of leverage, too. Other components of "Tier 1" and "Total" capital are more relevant to resolution, since they affect the creditor hierarchy for the absorption of losses in insolvency. The Accord needs further revision to recognise this vital distinction between *going-concern* and *gone-concern loss-absorbing capacity*. See below in this section.

that looked low risk to regulators and bondholders.[8] It will be a backstop; one that will bite on those firms whose business is heavily concentrated in activities carrying very low risk weights.

But whether the minimum risk asset ratio was 10 percent, 15 percent, or 20 percent, or the leverage cap 33x or 25x, a static regulatory capital requirement of this kind will not prove sufficient for every state of the world. This is driving moves to a richer *macro-prudential* regime capable of adjusting requirements where warranted by changing economic and financial conditions.

Time-Varying Macro-Prudential Policy: Credit Cycles and Regulatory Flexibility

"Cyclical" variation of headline or sector-exposure capital (and other) requirements is a completely new dimension of the regulatory settlement. It is too often caricatured as almost absurdly ambitious: manage the credit cycle; employ robust, scientific criteria for identifying bubbles; find the optimal combination of macro-prudential and monetary instrument settings.

While those should be long-term goals, there is a more modest way of approaching policy in the meantime—by framing the primary goal as *sustaining the resilience of the financial system* in the face of material changes in financial and economic conditions. If the environment became a lot more risky than contemplated when the parameters of the base regulatory framework were determined or if a boom were inflating the accounting equity of intermediaries,[9] the desired degree of resilience could be preserved by temporarily increasing minimum capital requirements (or, as discussed below, minimum collateral requirements). In other words, build up buffers in the good times. This might be as important for clusters of medium-sized firms with correlated exposures as it is for SIFIs. It might or might not dampen a boom, but the bust would be milder than otherwise because the financial system would be more able to bear the losses. A debt-overhang would still impede the subsequent macroeconomic recovery, but the downturn will be less severe if banking does not collapse.

There is exaggerated pessimism about spotting vulnerabilities from credit-fuelled booms. Absolutely nothing is foolproof, but policymakers need to be open to placing weight on anecdotal evidence alongside rigorous analysis. Chuck Prince was not the first to point to the problem of leaving the dance floor while the music was still playing. Before the bust in 2007, Wall Street risk managers saw individual firms as facing a difficult choice between financial risk (a runaway credit boom) and business risk (withdrawing from a market before an uncertain bust, only to see their franchise destroyed as business moved to their competitors).[10] This was a powerful signal of a collective action problem. Timely macro-prudential interventions (not empty talk) can potentially act as a coordinating device for intermediaries to exit the dance floor together, helping to dampen the pro-cyclical dynamic of a system left to its own devices.

There is exaggerated pessimism about spotting vulnerabilities from credit-fuelled booms.

The introduction of macro-prudential policy (macropru) fills a gap, permitting a better overall policy mix. In relation to monetary policy, macropru is the first mover. It needs to take account of monetary influences on risk-taking behavior, but leaves monetary policy itself freer to concentrate on managing the path of nominal demand in pursuit of an inflation target. And in relation to micro-regulatory policy, the basic requirements did not need to be calibrated for the very worst states of the world given that they can be temporarily increased where warranted. That weighed in Basel III, reducing inadvertent risks to long-run economic growth.[11]

[8] An example is lending to Latin American and East European sovereigns in the late 1970s–early 1980s when a leverage limit was the main constraint on bank balance sheets. See Duffie (2013), presentation on the limitations of a leverage limit at a Brookings conference.

[9] See Adrian and Shin (2010).

[10] Market intelligence to that effect was fed into official systemic-risk assessments; for example, see Bank of England *Financial Stability Review* (2006), pp. 8 and 30. Another example is the telecom company debt boom in the early 2000s. The euphoria could be picked up while queuing for morning coffee on Wall Street or in the City, but it almost felled some major global banks in late 2002 in a widely neglected near-crisis.

[11] For research reaching a similar conclusion, see Aghion and Kharroubi (2013).

Of course, there will be challenges. At times regulators will need the will, as recently, to overcome banks' reluctance to raise new equity, in order to contain economically destructive deleveraging. More profoundly, macro-prudential policy can hardly work unless regulators can judge how robust or vulnerable the system is in the face of gathering threats. Systematic stress testing can transform those assessments, potentially bringing about a revolution in prudential supervision.

Systematic, Transparent Stress Testing: A Revolution in Supervision

The Federal Reserve has led the world in introducing credible tests of banks' capital adequacy. As well as being forward-looking and focused on tail risk, they are annual, concurrent, systematic and, by any previous standard of supervision, highly transparent. They aid an assessment of resilience taking into account correlated exposures across firms. Other jurisdictions are following. Alongside greater disclosures by banks themselves, these reforms can reduce the opacity of banking, aiding more-discriminating market discipline.[12] And if eventually more account can be taken of feedback mechanisms, the tests can be more *macro-prudential*.[13]

Within central banks, modern stress testing entails bank supervisors and macroeconomists working together. If sustained, this will be a remarkable achievement under Chairman Bernanke's watch, helping to break down cultural silos and, thus, to make a success of combining in one institution the two dimensions of maintaining a stable monetary system: price stability and banking stability.

The transparency is necessary given the damaged reputation of supervisors.[14] But its greatest long-term benefit may be to transform public accountability for prudential supervision. Year by year, everyone will see the severity of the chosen stress scenarios as well as the results, and legislators will be able to examine regulators on both. This takes a step towards the kind of accountability familiar in monetary policy. Supervision need no longer be a mystery, of interest and accessible to the public and their representatives only when something goes badly wrong.

But none of these benefits will be secured unless the authorities have technically feasible and credible choices, other than taxpayer bailout, when a transparent asset-quality review or stress test reveals a banking group to be abjectly weak. The European Union (EU) stress tests a few years ago demonstrated that.

Resolution: Solving Too Big to Fail and Future Constraints on Bank Balance Sheet Structure

This matters hugely because improvements in bank regulation and supervision will not consign distress to the dustbin. Should it be thought that this problem could be overcome by applying a much-higher-than-planned equity capital requirement to banks (even 100 percent), remember that would simply lead to the problem of excess maturity transformation and leverage relocating to elsewhere in the financial firmament.[15] Similarly, even if the payments part of commercial banking were *completely* separate, instability in wholesale markets, spilling into the wider economy, could occur from distress amongst trading intermediaries that were fragile and interconnected; "narrow banking" could not on its own make the world safe. Plus, history suggests that, more than other reforms, bans on activities are repealed by later generations. Hence the international community's "bookends' strategy": make financial institutions a lot more resilient but also make them resolvable without taxpayer solvency support.

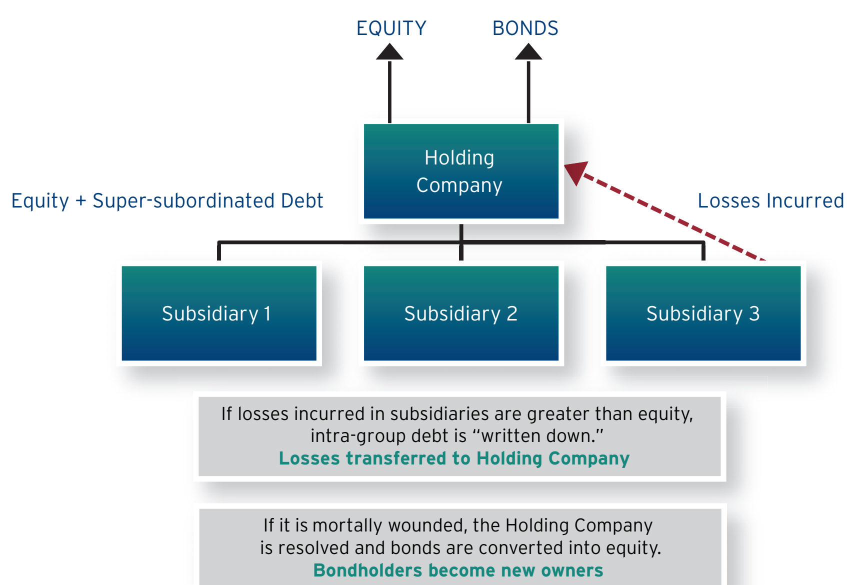
Solving the TBTF problem is necessary to return banking to its place in market capitalism, and to stem creeping balkanisation of global finance. There is no other way of solving the problem as only resolution policy engages directly with what happens when a firm faces *insolvency.*

[12] Notably, the measures recommended by the private sector Enhanced Disclosure Task Force.
[13] See, for example, Bank of England (2013a).
[14] Transparency is not complete: notably, the regulator's own models are not published given the risk of gaming by the banks.
[15] Larry Kotlikoff's proposal that all financial intermediaries be forcibly converted into mutual funds aims to be an intellectually coherent attempt to meet this point, but at the cost of garnering no practical support given the massive uncertainties of its effects (Kotlikoff 2010).

In future, rather than focusing exclusively on the probability of failure, supervisors must also work backwards from insolvency, ensuring that distress does not entail taxpayer bailout or a systemic crisis. This is already transforming how supervisors spend their time. But I have to say that the tens of thousands of pages churned out by banks for U.S. agencies in the name of "living wills" risk missing the big point, which is that groups must have simpler legal, financial, and organisational structures that positively enable orderly resolution. That is *the* big structural reform.[16] Regulators and resolution authorities must deliver it.

The model developed by the international community—putting losses exceeding equity onto bondholders and other creditors, regardless of geography but consistent with the creditor hierarchy—is essentially as follows.[17] Firms must be structured so that, either for the worldwide group as a whole or for well-defined subgroups, losses are transmitted upwards to a group or intermediate holding company. And if that holding company is broken as a result, it is resolved by converting into equity as much as necessary of externally issued bonds, whose holders become the new owners. (See FIGURE 3.) A plan for a group to be resolved as a whole is known as single-point-of entry resolution. When a group would be split up, it is multiple point of entry. Whether a financial group is single or multiple point of entry—already widely referred to as SPE and MPE—will, I believe, transform the way banks are structured, run and talked about over the coming decades. It should, for example, drive requirements on how equity capital is distributed across the entities in a group. The FDIC's plans for resolving U.S. SIFIs using its new Dodd-Frank powers fall firmly within this global model.

FIGURE 3. Banks' Structure for the Future



A necessary condition for it to work is that financial groups maintain in issue a critical mass of bonds which can be "bailed-in" to cover losses and recapitalise a firm to the required equity level. In my view, regulators should require group holding companies[18] to issue at least as much long-term debt as their equity requirement—i.e., at least 10 percent of risk-weighted assets for the biggest groups, producing total loss-absorbing capacity (equity plus bonds) of over 20 percent *before* any operating liabilities would need to absorb losses. Last year's G-20 summit called on the Financial Stability Board to agree a policy on this by this autumn.

[16] This is not inconsistent with ring-fencing of *essential* services as a fall back.
[17] See FSB (2013b).
[18] For multiple-point-of-entry groups, read: subgroup *intermediate* holding companies.

Improvements in bank regulation and supervision will not consign distress to the dustbin.

These plans *can* solve the challenges in the cross-border resolution of international banking groups. In essence, the solution is for overseas (and domestic) subsidiaries to issue super-subordinated debt to their parent group. This enables losses exceeding a subsidiary's equity to be transmitted up to the holding company, without the subsidiary itself going into default—at last making a reality of the long-standing doctrine, underpinning all consolidated supervision, that groups/subgroups are a source of strength for their component parts.[19] If as a result the holding company is mortally wounded, the group's home country authorities can resolve it, and it alone. Thus, a group-wide, global resolution is executed without operations across the planet going into local liquidation or resolution. Dodd-Frank is entirely congruent with that. It is central to the recently finalised EU resolution legislation.

By framing the trigger for "converting" intra-group debt into equity, home and host authorities can hard-wire co-operation; or if they fail to agree on a trigger, they at least discover ex ante rather than ex post that they can't rely on each other. This would usefully give a harder edge to discussions amongst home and host authorities in supervisory and crisis-management colleges.[20]

Strengthened resolution regimes coupled with restructuring of complex international groups can put the financial system on a more secure, market-based footing. If firms can be re-capitalised via resolution, liquidity stress will be both slightly less likely, and, if it occurs, easier for the central banks to address, as discussed in the final section. By taking losses, bondholders' incentives can be flipped, making them active monitors of imprudence and so harnessing them to stability. The same goes for management if they were paid in debt that writes-off to zero in resolution.

Important practical steps are needed over the next year or so to get over the finishing line, including eliminating cross-guarantees and other clauses that could trigger contracts being declared in default when a group is being resolved.[21] But it is now basically a matter of will. Those who doubt the willingness of the authorities to execute these plans in earnest should ask themselves what incentives officials face in again asking taxpayers, via governments and legislatures, to take a bust bank's losses.

Shadow Banking and Regulatory Arbitrage: The Challenging Need for Regulatory Flexibility

The souped-up resolution regimes have to extend beyond banks to any institution which might endanger stability, not least because the business of banking will not stay wholly within firms treated by the law as banks. As banks are re-regulated—with greater constraints on the structure of their balance sheets and on the types of asset they hold—the substance of banking will inevitably re-emerge elsewhere: shadow banking. Policymakers have, therefore, stressed the fragility of intermediaries heavily reliant on short-term wholesale funding, which frames the debate within the legitimate concerns of the lender of last resort.[22] Some of this is easy enough. Most obviously, don't let banking groups create, run or stand behind off-balance vehicles that don't have to be consolidated for accounting or prudential purposes.[23] In a similar spirit, if an important institution is substantively a bank, regulate it as a bank— although, as discussed in the third section, this is easier said than done in some jurisdictions.

[19] It is economically equivalent to a collateralised parental guarantee. A pure guarantee would leave a subsidiary and its host jurisdiction exposed to the ability and willingness of the holding company to pay.

[20] The host authority for a key subsidiary must have a finger on the trigger for converting intra-group debt into equity. If the home country alone controlled the trigger, host authorities would likely be worried that the home authorities might not, in fact, pull the trigger. That would not help to stem regional balkanisation of banking groups operating internationally.

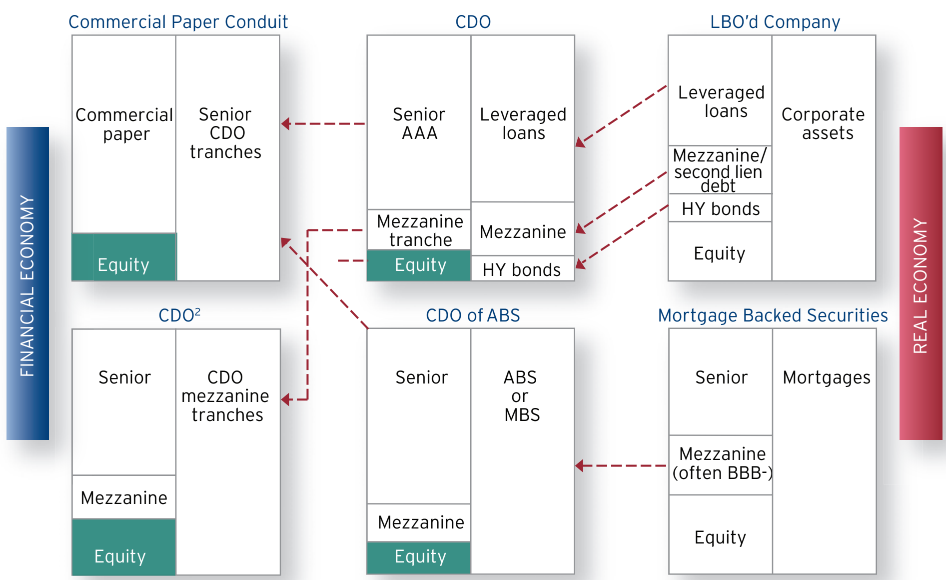
[21] See FSB (2013c).

[22] This has been stressed by Federal Reserve Board Governor Daniel Tarullo. See, for example, proposition 4 in Tarullo (2013).

[23] An interesting test will be whether, as they should, regulators require consolidation of constant-value money market mutual funds managed by banks' asset-management arms.

But it is more complicated than that. If TBTF is the single greatest challenge in underpinning financial stability, close behind it is endemic regulatory arbitrage. The financial services industry is a shape-shifter. As insurance firms have shown, with disastrous results in the case of AIG, anybody holding low-risk securities can build their own shadow bank by lending-out ("repo-ing") their securities for cash and investing the proceeds in a riskier credit portfolio. That is, in principle, still amenable to the regulation of institutions. But *banking-like* fragility can be generated through Russian doll–like chains of transactions or structures, via which *aggregate* leverage and/or liquidity mismatches *gradually* accumulate, but which don't involve a financial firm which could be re-labelled and regulated as a bank; for example, in the run up to the crisis conduits funded by short-term paper invested in tranches of securitisations themselves invested in securitized paper (FIGURE 4). This broad phenomenon is an issue for EMEs (emerging market economies) as well as "advanced" economies.

FIGURE 4. **Securitisation to the Shadow Banking System**



AAA and **BBB** = ordinal rankings
ABS = asset-backed securities
CDO = collateralised debt obligation
CDO² = CDO that has invested in the tranches of another CDO
HY = high-yield security
LBO = leveraged buyout
MBS = mortgage-backed security

Some good policies are in the pipeline.[24] Nevertheless, I worry that the authorities—perhaps particularly in this country—face problems in finding robust solutions, partly for political economy reasons.

Legislators in many countries favour rules-based regulation in order to guard against the exercise of arbitrary power by unelected regulators. But a static rulebook is the meat and drink of regulatory arbitrage. And the more detailed the rules, the more rules-arbitrage is implicitly legitimized, because the rule-makers must have said precisely what they meant and no more. "Reg-arb" is why money funds grew here (Regulation Q), and why asset-backed commercial paper conduits could be core to banks' treasury management unconstrained by bank regulation.[25] And quirks in regulation led to broker-dealer groups and commercial companies sidestepping bans on banking via so-called industrial banks in Utah *with* FDIC insurance. I could go on. This shape-shifting dynamic can leave policymakers in a game of catch-up, responding only as each incarnation becomes systemically significant—this year money funds, next year who knows what: real-estate investment trusts, credit funds, leveraged exchange-traded funds? A game that sooner or later the authorities would be

[24] See FSB (2013a) and Tucker (2012).

[25] United States–domiciled banks were active users of conduits and structured investment vehicles, making a canard of suggestions that the critical prudential failures were all in securities-dealer supervision and abroad.

doomed to lose. That is not least because by the time the products of reg-arb are evidently systemically significant, they have the lobbying power to delay reform.

Framing policies that are adaptable, legitimate, and consistent with the mandates of existing agencies would be a challenge. I return to this below in discussing policy on markets and the importance of building new macro-prudential regulatory institutions.

Central Counterparties: Simplifying the Network and Residual Challenges

The fourth plank of policy is to simplify the network of credit exposures amongst banks and dealers. For their members, CCPs do this by acting as a buyer to every seller and a seller to every buyer in the markets they serve. By netting all offsetting transactions on a multilateral basis, they cancel bilateral exposures arising from transactions in the capital markets. And having absorbed the counterparty-credit risk on to itself, a CCP applies collateral (margin) requirements, and holds a mutualised default fund in case its collateral falls short in the event of a member's default. In 2009 the G-20 leaders decided that all "standard OTC derivatives" must be cleared by CCPs. And, to impede regulatory arbitrage, minimum margin requirements will be applied to remaining bilateral transactions. This is a coherent policy.

Nevertheless, three big issues were barely identified back in 2009: 1. What happens if a CCP fails? 2. Are they set up consistently with combining the social purpose of stability with the private purpose of generating profits for their owners? 3. Which markets should they clear?

Disorderly failure would cause mayhem. The benefits of simplifying the network of counterparty credit exposures must be safeguarded by measures to ensure that CCPs redistribute post-netting risks back to their clearing members and, crucially, that they are resolvable without a taxpayer bailout. How tragic if they were too important to fail. Belatedly, the need for policies on the resolution of CCPs is in hand internationally, and must not slip.[26] It is not clear which agency in the United States is gripping it.

The challenge of combining private and social purposes may be more problematic. Increasingly part of vertically integrated exchange groups, clearinghouses are exposed to profit-making incentives that could distort their utility-like functions. They can and should act as system-risk monitors and managers in the markets they clear, with risk management policies that are not only amongst the best, but which take account of feedback effects and pro-cyclical dynamics. That requires a shift in mindset, which may be slow in coming absent well-targeted nudges from the authorities. Were a clearinghouse to fail in a disorderly way, I am certain that legislators would ask why on earth the authorities had allowed them to be for-profit entities.[27] But I do not have a sense that the issues around governance and incentives are being seized in the United States or elsewhere.

On the required scope of centrally cleared markets, it makes sense for derivatives to be centrally cleared as, in bilateral deals, the buyers of protection are exposed to their "insurer's" ability to pay without being able to see its other exposures. Nevertheless, there is something distinctly odd about high-level policy having been cast in terms of only OTC contracts and derivatives. Why not cash instruments? Why not exchange-traded contracts? In fact, many cash instruments *are* being centrally cleared—both in the money markets (government bond repo) and exchange-traded securities (equities). Policy needs to pay as much attention to these activities, which present different liquidity risks, as to derivatives clearing. More widely, given the international reach of some infrastructure providers, and the certainty of cross-border spillovers if some others were to fail, there is as good a case for applying special policies to *globally systemic infrastructure providers* as to global banks.

[26] The international standard is the Committee on Payment and Settlement Systems–International Organization of Securities Commissions (CPSS-IOSCO) Principles for Financial Market Infrastructure. CPSS-IOSCO are due to publish plans for loss-allocation recovery measures, and the FSB is due to make clear how the internationally agreed resolution regime would be applied to CCPs.

[27] For similar sentiments, see Dudley (2013). (William C. Dudley is the president of the New York Federal Reserve Bank.)

II. Banking Meets Capital Markets: Gaps in the Reform Programme

That brief survey of the four planks of the core reform programme highlights that two of them in particular—CCPs and shadow banking—bridge banking policy and markets policy. But there is more to do given changes over the past forty years or so. Once upon a time banks extended and held illiquid loans, overseen by banking supervisors. And in a largely separate universe, securities regulators policed the integrity of *individual* transactions and offerings of securities on *public* exchanges served by specialist broking and market-making intermediaries. That world is long gone. The terrain has been transformed by the growth of *private* capital markets, trading of loans, OTC markets, derivatives, securitisation of portfolios of illiquid assets, and short-term money (or repo) markets employing a vast range of securities as collateral. Further, with controls on cross-border flows of capital having been dismantled more than a generation ago, most markets are international. Absent a seismic shift in global politics, there is no chance of the clock being completely turned back.

This matters for stability, as illustrated by the example given above of securities lending being used to "roll your own shadow bank." It isn't enough to focus on large systemic institutions, or on banks more generally. Activities and markets matter for stability too. During 2007, liquidity in markets for borrowing secured against asset-backed securities (ABS-repo) evaporated when credit-rating agency (CRA) ratings were called into question. Traders relying on what had seemed a deep secured-financing market were left high and dry. Problems in the underlying capital markets were compounded. Lesson: a *money market* becoming big can do great damage if it turns out to have flakey foundations.

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More generally, prices in the *underlying asset markets* don't always self-correct in orderly ways. Imagine a market in which pretty much all of the demand turns out to be from levered investors; the most senior tranches of ABS might be an example. In buoyant states of the world, the market would be prone to elevated valuations, making the asset class uneconomic for unlevered investors. But if the risks in the instruments haven't been grasped and over-issuance makes them more risky still, the dominant levered investors will rush for the door when they are shaken out of their myopia.[28] A sharp correction might drive the cost of finance for *new* issues to prohibitive levels, tightening credit conditions if there aren't ready alternative sources. Such fire sales can constitute instability with social costs.

If this is correct, there are worrying signs of policy malaise. First, there is *faltering vigour* in pursuing some intended market reforms:

- Lack of convergence in accounting standards, and here in the United States a strong *Financial Accounting Standards Board* commitment to mark to market even longish-term investments
- The persistence internationally of official sector policies, and hence private sector investment practices, mechanistically linked to CRA ratings, contrary to a G-20 decision over three years ago[29]
- The project to develop trade repositories having to be forcibly steered back to the G-20 objective of making it easier for macro-prudential authorities to see how the financial system fits together
- Still not having much information on the leverage of hedge funds to help understand vulnerabilities in the financial system, notwithstanding the 2009 G-20 summit declaration making this a priority[30]

[28] See Gennaioli, Shleifer, and Vishny (2010).
[29] See FSB (2010). In the United States the problem is different: an absolute ban on regulators placing any weight on CRA ratings.
[30] See, for example, Bank of England (2013b). The desire for the information does not reflect a view that the fund industry is necessarily systemic.

Second, *clarity of purpose and coherence* seems somewhat lacking. That is suggested by the uncertainty around whether the cocktail of banking/insurance/securities/accounting reforms have cleaned up securitisation markets or overshot, impeding markets that indirectly give small borrowers access to the capital markets. Similarly, it seems to be difficult to find agreed high-level objectives to help adjudicate between U.S., EU and Asian securities regulators on whether policies on trading platforms and transparency should apply across borders.

A Missing Framework for Markets Policy

These are symptoms of a missing conceptual framework for stability-policy on markets. There isn't an off-the-shelf equivalent of figure 1.

Such a framework would need to address the big question of which markets are especially important to the real economy, or to the financial system itself; and what qualities those markets need to avoid egregious risks to stability. Key concepts would be, respectively, whether there were ready substitutes if a market closed, and the *resilience* of the liquidity of a *systemically relevant* market. A framework of that kind would have focused policymakers' attention on the workings of the ABS markets and, in particular, on the associated repo markets well before the crisis. It might also help to design reforms to property finance, and to decide whether or not there could be meaningful threats to stability from, for example, asset-management practices and structures,[31] dark pools, and algorithmic trading.

On market liquidity, the authorities need to examine not only risks in the underlying instruments individually—the traditional approach of listing authorities—but also any risks associated with heavy *aggregate* issuance and the associated indebtedness of the underlying borrower *class*. As those underlying risks build, the capital market might be put in jeopardy directly, or indirectly if the associated secured-financing market has become unsustainably big. Like any money market, a repo market will be liquid only if the participants believe they don't need to examine each collateral bundle.[32] Money markets are the key link between banking and shadow banking, and the capital markets (FIGURE 5).

FIGURE 5. **Linking the Spheres**

[31] The U.S. Treasury's Office of Financial Research (2013) has published a paper on possible implications of concentrations in asset management.

[32] The importance of information-insensitive securities, epitomised by money-market instruments, is stressed in a series of papers by Gary Gorton and Bengt Holmström. See, for example, Holmström (2008). Some central banks examined ABS collateral bundles very carefully when, as ABS-repo dried up during the crisis, they widened the instruments eligible in their liquidity-insurance operations to support banking-system liquidity and funding.

Policy Instruments

This approach suggests a range of policy measures for *systemically relevant markets*, distinguishing between the capital market and its associated financing market(s). For example, infrastructure could be prescribed; settlement periods could be shorter; the dealer community could be stronger; circuit-breakers could be contemplated; CRA practices could be overhauled; warnings could be issued about risks given aggregate patterns of issuance; and for the secured-financing markets in particular, minimum collateral requirements could be set or raised.

While some of those instruments would be novel—for example, a new macro-prudential approach to the functions of the listing authority—others are already more or less incorporated in to the international reform programme. The most important instance of that is the plan to set minimum requirements on the haircuts (i.e., the excess collateral) taken in repo and securities-lending transactions.[33] This is warranted because, as with bank capital levels, left to themselves private markets will tend to set haircuts that are too low given the social costs of uncovered defaults; and also because haircuts have been pro-cyclical, being shaved as markets become more buoyant, less volatile and apparently liquid, only to be raised sharply when conditions deteriorate.[34] In economic substance, such minimum requirements are akin to a cap on the leverage of the counterparties (if that is their main source of finance), and so can give the authorities indirect levers over some variants of shadow banking. They need to be paired with minimum over-collateralisation requirements for credit vehicles funded in short-term commercial paper markets, which mimics a bank capital requirement. This illustrates the need for consistent policy across the fuzzy boundaries between markets, vehicles and firms.

But where the underlying collateral is fundamentally unsuitable for a *money* market, the authorities might need to go farther. If spotted in time, this might mean impeding the development of a money market, offsetting the inducements of over-generous CRA ratings, and insisting on maximum transparency to underpin the policy. Where the authorities are late but still ahead of the markets, a richer response is needed so that the authorities don't bring about the crisis they aim to prevent. This underlines the need to think about markets policy in a new way.

III. Building Institutions: A New Regulatory Architecture and Culture

The reforms under way in banking, those needed in market regulation, and wider lessons about regulatory arbitrage and macroeconomic-financial system feedback mechanisms necessitate institutional and cultural change amongst regulatory agencies. Above all, central banks and banking supervisors are having to recover their historic mission for systemic stability.

Implications for Securities Regulators

The implications for securities regulators are equally momentous. Typically, securities regulators have micro-regulatory jurisdiction over capital markets, asset managers and many manifestations of shadow banking. But their statutory objectives and historical mission and cultures are centered on the vital importance of honesty and efficiency, in the interests of investor protection, rather than on avoiding runs and, more broadly, preserving systemic stability. Given the changes in markets over recent decades, securities regulators have to grow beyond their roots. And they need to invest more in agreeing common policies internationally via IOSCO. But this is not easy. International agreements entail openness and compromise. In the United States, protracted debate about money market mutual fund reform, notwithstanding the domestic and international macro-prudential consensus, has left the rest of the world anxious about the capacity of the authorities here to grapple with shadow banking. In the United Kingdom, people worry that the Financial Conduct Authority will not give sufficient weight to its prudential oversight of funds and asset managers or to using its listing-authority powers in the interests of stability. Some reorientation of securities regulators' objectives and

[33] Parallel requirements will be set on the initial margin (up-front collateral) taken in derivatives transactions, whether centrally cleared or otherwise. They will need to be consistent because derivatives can be structured to synthesise financing transactions.

[34] For the increase in repo haircuts during the crisis, see Gorton and Metrick (2009).

priorities towards stability is needed.[35] It is the responsibility of legislatures to help that happen, through legislation and questions asked during testimony.

But central banks and banking supervisors need to meet securities regulators half way, widening their engagement on markets and finance. "Macropru" is a lot more than banking supervision for macroeconomists. Amongst other things, central banks should accept that, standing at the apex of the monetary system, they have a special responsibility for the health of the money markets.

Overlap is preferable to underlap: turf disputes won't work as a defence for failing the public. The creation of macro prudential authorities is the big initiative intended to address these issues.

Macro-Prudential Institutions: Flexibility Redux

Preserving stability without sacrificing efficiency requires policies that are highly adaptable to innovations, regulatory arbitrage, and evolving cyclical conditions. Flexibility is needed to avoid over-regulation and the stability of the graveyard; we need healthy market-based finance. Policy must be joined up across sectors. But diversity is also badly needed. The authorities need instrument independence in order to overcome the time-consistency problem of credibly committing to "take away the punchbowl," building resilience to mitigate threats from incipient booms. That package can't be achieved unless legislators give macro-prudential authorities appropriate goals, powers and discretions, for which they can be held accountable.

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In the United States, the umbrella macro-prudential body is the Financial Stability Oversight Council (FSOC). Its design is, perhaps, imperfect. It is a committee of representatives, whose duties to Congress are in respect of the agencies they head rather than the FSOC's stability objective.[36] Where it has clear powers, its authority has already been apparent: notably, in designating some non-banks as "systemically important." As well as Federal Reserve oversight, that entails submitting annually to the FDIC a plan for how they might be resolved *under regular bankruptcy law* without destabilising the U.S. financial system, an essay question it will be hard to pass. But, quite apart from the hazards in the label, the new U.S. regulatory regime does not cater well for circumstances where no *individual* non-bank of a particular kind is "systemic" but, taken together, a group of medium-sized firms or funds, or an activity, could bring about systemic distress. It is not yet clear how much force the FSOC's public recommendations to the various regulatory agencies will carry. That is the essence of the money market mutual fund problem.

The other dimension of macro-prudential policy is building resilience during booms. While U.S. legislators did not explicitly address "cyclical" variations of regulatory requirements in Dodd-Frank, the Federal Reserve probably has discretion to make temporary changes to banks' headline capital requirements. It is less clear which U.S. agency could and would be prepared to vary minimum margin/haircut requirements.

Added to that, international co-operation may be needed. No country can combine open capital markets and cross-border banking, financial stability, and autonomy in national policy.[37] At the least, home and host authorities will need to co-ordinate on setting countercyclical buffers for internationally active banks. More widely, some national measures may

[35] The new Principle 6 of IOSCO's core principles calls upon jurisdictions to give securities regulators a stability objective ranking equally with other objectives, but implementation is at best patchy. Biographical note: I designed a securities regulatory system some years ago (in Hong Kong).

[36] The United Kingdom's Financial Policy Committee is different in that respect.

[37] On the *financial stability trilemma*, see Schoenmaker (2013).

be taken to mitigate threats to stability from unaddressed flaws in the international monetary system. For example, the cross-border, cross-currency carry trade remains as potent as ever, leaving some countries concerned about volatile capital flows associated with burgeoning short-term external liabilities. Employing macro-prudential instruments to influence the *composition* of inflows and so mitigate vulnerabilities in national balance sheets may sometimes make sense, but entails a degree of collective surveillance of the global system.[38]

In terms of building institutions, it is unclear whether the FSOC, supported by the Office of Financial Research, can handle all those dimensions of macro-prudential policy. What happens when a source of risk is not within the current jurisdiction of *any* micro-regulator? Whatever the answers, the Federal Reserve needs to be ready to take to the FSOC table, and make public, its views on what actions other U.S. agencies should take to preserve stability. Even where responsibility for supervisory lapses lies elsewhere, the consequences can end up at the central bank's door—or, rather, on its balance sheet.

Implications for the Lender of Last Resort

As institutions created in order to ensure the stability of the monetary system, this has been a crisis of central banking too. Relying on monetary policy to mop up proved deeply flawed when the backbone of the credit system collapsed. Moreover, actions taken to contain the early stages of crisis met with a mixed reception. As well as providing lender of last resort assistance to depository institutions, central banks have acted as market-makers of last resort; as LOLR to non-banks; and even, through soft terms, arguably as capital-of-last-resort providers in some cases.[39] However vital in containing instability, those operations raised questions of legitimacy.[40] The regulatory reforms help to address those concerns.

Some of the challenges are old, and revolve around forbearance. The time that the central bank provides to banks and the economy more widely to address underlying problems may not be used well. Central banks that are also prudential supervisors can be tempted to lend to fundamentally unsound firms, in the hope that something will turn up to cover their supervisory failures. And having provided assistance, they may be tempted to extend support beyond the point at which the firm is clearly insolvent.

The reforms *can* make a big difference. Systematic, transparent stress testing should make it much harder for supervisors to avoid facing up to a firm's problems being fundamentally of solvency. And if a firm deteriorates *after* liquidity assistance has been provided, with a forthcoming stress test set to reveal the problem has become solvency, central banks should no longer face a desperate choice between maintaining support or pulling the plug. The firm can go into resolution. With termination of lending credible, there will be stronger incentives for borrowers to use the time provided by LOLR support. All this should help to underpin the operational independence of central banks and other supervisors, shielding them from the day-to-day political interventions that would be hard to avoid if the only credible backstop were a taxpayer bailout of bondholders and other uninsured creditors. In addition, post-resolution provision of liquidity assistance should be a more powerful signal that solvency and basic viability have been restored.[41]

A second set of issues revolve around scope. What if destructive fire sales can be contained only by providing liquidity to solvent non-bank financial institutions or by acting as a backstop market-maker? That is partly about finding a time-consistent policy, which lies beyond this paper's scope.[42] But it is also about jurisdictions facing up to intermediaries regulated as non-banks in fact conducting banking. Before the crisis, an obvious case was the U.S. securities dealers.

[38] This might well have been a more fruitful way into post-crisis debates about the international monetary and financial system than the focus on symmetric adjustment of cumulative current account imbalances.

[39] See, for example, Humphrey (2010).

[40] See Goodfriend (2013).

[41] U.S. legislation permits the Federal Reserve to lend secured on a bilateral basis to banking businesses being returned to viability via resolution, and to lend to non-banks in similar circumstances via market-wide facilities.

[42] See Tucker (2009) for some principles for market maker of last resort operations.

They suffered a massive liquidity run when hedge funds and others withdrew idle balances on demand. Prime brokerage services included basic banking. Is the system any better now at proactively confronting such regulatory anomalies?

IV. Summing Up: Static Rules vs. Flexibility

The crisis left the credibility of supervisors and regulators in tatters. It won't be repaired quickly.

A problem in assessing improvements in *supervision* is that it is mighty difficult to spot bad supervision from the outside. In assessing a modern monetary policy regime, pretty well everything is written on the tin: the objective, the instruments and the models, but also the deliberations of the policymakers. What society gets is what it sees. Contrast that with prudential supervision. The regulatory laws, rulebooks and published policies might all look fine, but give a misleading picture of the reality of supervision on the ground. That is one reason why the International Monetary Fund's (IMF's) assessments of countries' regimes failed to expose deeply flawed supervisory practices before the crisis. It is why a shift in transparency is needed, and why the advent of systematic stress testing is so important. Even then, there's a question of how to keep the supervisors on the straight and narrow. I should like to see multinational teams—drawn from key hosts as well as the home supervisors—involved in *collective* stress testing of the global SIFIs, including central counterparties.

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In contrast to supervision, it is easier to see what is really going on with overhauling *regulation*. But a distinction needs to be made between banking and capital markets. The core programme for reforming banking is coherent: reduce leverage, opacity and interconnectedness; improve liquidity; and transform resolvability. Whether it does the job depends above all on two conditions. First, whether all firms will truly be resolvable without taxpayer solvency support: bail-in not bailout. Solving the TBTF problem is definitely within reach: it is now a matter of will. It can help to put a brake on the balkanisation of international finance by providing a framework for determining the distribution of equity capital across a group, and by hard-wiring co-operation between home and host authorities. But in addition to the Financial Stability Board's peer-review process, which *must* involve truly top officials who will be on the line when a firm fails, enough information must also be made public for third parties to judge resolvability. I am more agnostic about the second pre-condition for success: whether the authorities will be sufficiently fleet of foot and the regime sufficiently *flexible* to keep up with regulatory arbitrage driving the substance of banking into shadow banks. The 2013 summit concluded that all jurisdictions must have a regime for coping with threats to stability from shadow banking. The jury on whether this will be delivered is out. Some jurisdictions have done more than others.[43]

The story is somewhat less compelling on the markets. There is less coherence, faltering vigour, and conflicting views about how different national regimes should apply to inherently international markets. Arguably there is also more time, but not much. Jurisdictions need to enrich the statutory objectives of their securities regulators, or endow macro prudential authorities with wide and *flexible powers* to take action to forestall threats to stability—whether structural or cyclical—from anywhere in the financial system.

I have stressed *flexibility* rather than a static rulebook. Coping with endemic regulatory arbitrage and the shape-shifting dynamic of finance requires that. Similarly, to be sufficiently forward-looking to mitigate serious threats from the credit cycle, the authorities will need degrees of freedom (instrument independence) hitherto more familiar in monetary policy than in regulation. This raises real political economy issues, perhaps especially here in the United States, due to

[43] For example, in the United Kingdom Parliament has established that, on the recommendation of the Bank of England's Financial Policy Committee, the perimeter of regulation may be changed by the executive government subject to expedited review by Parliament itself (secondary legislation).

the need either for greater discretion to be granted to regulatory agencies or for a more expeditious legislative process. The challenge is to establish a regime of *constrained discretion*, as advanced in the monetary policy sphere. I sense that there has been more debate about this in Europe, including in the United Kingdom, where the new statutory regime is explicitly macro-prudential. That being so, if only to protect its balance sheet and reputation the Federal Reserve will need to be noisy when it sees real threats to stability, whatever turf it crosses.

But to conclude on a positive note, some of the problems presented by LOLR operations can be cured by the regulatory reforms, particularly the development of improved resolution technology and of systematic, transparent stress testing. This is of first-order importance, and owes much to thinking in the Federal Reserve under Chairman Bernanke. Central bankers need to keep their LOLR role, and therefore the adequacy of the regulatory regime, at the heart of their principles and practices. If they do, the world won't be completely safe, but it will be safer.

References

Adrian, Tobias, and Hyun Song Shin. 2010. "Liquidity and Leverage." *Journal of Financial Intermediation* 19 (3): 418–37.

Aghion, Philippe, and Enisse Kharroubi. 2013. "Cyclical Macroeconomic Policy, Financial Regulation and Economic Growth." Working Paper 434, December. Bank for International Settlements, Basel, Switzerland.

Bank of England. 2013a. "A Framework for Stress Testing the UK Banking System." Bank of England discussion paper, October. Link: http://www.bankofengland.co.uk/financialstability/fsc/Documents/discussionpaper1013.pdf

June 2013b. "Financial Stability Report." Issue no. 33. Link: http://www.bankofengland.co.uk/publications/Documents/fsr/2013/fsrfull1306.pdf

July 2006. "Financial Stability Review." Issue no. 20. Link: http://www.bankofengland.co.uk/publications/Documents/fsr/2006/fsrfull0606.pdf

Dudley, William C. 2013. "Remarks at Panel Discussion on OTC Derivatives Reform and Broader Financial Reforms Agenda." Conference Held by the Banque de France, Paris. Link: http://www.newyorkfed.org/newsevents/speeches/2013/dud130912.html

Duffie, Darrell. 2013. "The Leverage Ratio and Bank Capital Requirements: Presentation on the Limitations of a Leverage Limit." Brookings Conference, October 31. Link to audio: http://www.brookings.edu/events/2013/10/31-leverage-ratio-bank-capital-requirements; Link to uncorrected transcript: http://www.brookings.edu/~/media/events/2013/10/31%20leverage%20ratio/20131031_capital_requirements_transcript.pdf, pp. 53–57.

Financial Stability Board (FSB). 2010. "Principles for Reducing Reliance on CRA Ratings." Link: http://www.financialstabilityboard.org/publications/r_101027.pdf

2013a. "An Overview of Policy Recommendations on Shadow Banking." August. Link: http://www.financialstabilityboard.org/publications/r_130829a.htm

2013b. "Guidance on Developing Effective Resolution Strategies." July. Link: http://www.financialstabilityboard.org/publications/r_130716b.htm

2013c. "Report to the G20: Progress and Next Steps Towards Ending 'Too-Big-To-Fail' (TBTF)." September. Link: http://www.financialstabilityboard.org/publications/r_130902.pdf

2013d. "To G20 Leaders: Progress of Financial Reforms." September 5. Link: http://www.financialstabilityboard.org/publications/r_130905.pdf

Financial Stability Forum. 2000. "Report of the Working Group on Capital Flows: Meeting of the Financial Stability Forum." Link: http://www.financialstabilityboard.org/publications/r_0004.pdf

2001. "Joint G10/Financial Stability Forum report." Unpublished.

Gennaioli, Nicola, Andrei Shleifer, and Robert W. Vishny. 2010. "Neglected Risks, Financial Innovation, and Financial Fragility." Working Paper no. 16068, June. National Bureau of Economic Research, Cambridge, MA. Link: http://www.nber.org/papers/w16068

Goodfriend, Marvin. 2013. "The Elusive Promise of Independent Central Banking." Link: http://ideas.repec.org/p/ime/imedps/12-e-09.html

Gorton, Gary, and Andrew Metrick. 2009. "Securitized Banking and the Run on Repo." Link: http://ideas.repec.org/a/eee/jfinec/v104y2012i3p425-451.html

Holmström, Bengt. 2008. "Commentary: The Panic of 2007. Comment on a Paper by Gorton." Jackson Hole. Link: http://www.kc.frb.org/publicat/sympos/2008/Holmstrom.03.12.09.pdf

Humphrey, Thomas M. 2010. "Lender of Last Resort: What It Is, Whence It Came, and Why the Fed Isn't It." *Cato Journal* 30 (2). Link: http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.165.5749&rep=rep1&type=pdf

Kayshap, Anil K., Raghuram Rajan, and Jeremy C. Stein. 2002. "Banks as Liquidity Providers: Explaining the Co-Existence of Lending and Deposit-Taking." *Journal of Finance* 57 (1): 33–73.

Kotlikoff, Laurence J. 2010. *Jimmy Stewart Is Dead: Ending the World's Ongoing Financial Plague with Limited Purpose Banking*. Hoboken, NJ: John Wiley & Sons.

Schoenmaker, Dirk. 2013. *Governance of International Banking: The Financial Trilemma*. New York: Oxford University Press.

Tarullo, Daniel K. 2013. "Macroprudential Regulation." Speech at the Yale Law School Conference on Challenges in Global Financial Services, New Haven, CT. September 20. Link: http://www.federalreserve.gov/newsevents/speech/tarullo20130920a.htm

Tucker, Paul. 2009. "The Repertoire of Official Sector Interventions in the Financial System: Last Resort Lending, Market-Making, and Capital." Speech at the International Conference: Financial System And Monetary Policy Implementation." Bank of Japan, May 27–28. Link: http://www.bankofengland.co.uk/archive/Documents/historicpubs/speeches/2009/speech390.pdf

2012. "Shadow Banking: Thoughts for a Possible Policy Agenda." April. Link: http://www.bis.org/review/r120427a.pdf

2013. "Resolution and the Future of Finance." May. Link: http://www.bis.org/review/r130606a.pdf

U.S. Treasury's Office of Financial Research. 2013. "Asset Management and Financial Stability." September. Link: http://www.treasury.gov/initiatives/ofr/research/Documents/OFR_AMFS_FINAL.pdf

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