

Working paper

The Dodd-Frank Act and Basel III

Intentions, Unintended Consequences, Transition Risks, and Lessons for India

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By

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Executive Summary

This note is an attempt to explain the changes to financial sector reforms under the Dodd-Frank Act in the United States and Basel III requirements globally; their unintended consequences; and, the risks to currently fast-growing nations such as India from transition of the global financial sector to these changes. The note also provides some broader lessons for India concerning financial sector reforms, government involvement in the financial sector, possible macro-prudential safeguards against spillover risks from the global economy, and finally, management of government debt and fiscal condition.

I start with a summary of reforms under the Dodd-Frank Act and highlight four of its primary shortcomings:

1. Lack of any attention to distortive role played by government guarantees to the financial sector;
2. A somewhat ill-conceived resolution authority which will likely contribute to substantial uncertainty at the time of next crisis;
3. Regulating by form rather than function in several restrictions being imposed on the Federal Reserve's lender-of-last-resort role; and
4. Not adequately dealing with shadow banking, especially with collections of individually small contracts and markets such as repo financing and money market funds which are collectively systemically important.

I then focus on the new capital and liquidity requirements under Basel III reforms. I argue that Basel III, like its predecessors, is fundamentally flawed as a way of designing macro-prudential regulation of the financial sector:

1. Basel requirements employ *static* risk-weights on asset classes and fail to capture any time-variation in relative risks of assets;

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2. They fail to recognize that risk weights alter incentives of the financial sector be exposed to different asset classes;
3. They ignore as a result any correlated or concentrated exposure of the financial sector to an asset class that has looked historically stable; and,
4. It does not employ more direct firm-level or asset-level leverage restrictions.

In contrast, Dodd-Frank has several redeeming features including requirements of stress-test based macro-prudential regulation and explicit investigation of systemic risk in designating some financial firms as systemically important. These overall limitations and some benefits of Dodd-Frank and Basel III are also brought out in a “back to the future” exercise that asks what difference, if any, these reforms would have made had they been in place during 2003-2008.

I argue that India should resist the call for a blind adherence to Basel III and persist with its (Reserve Bank of India’s) asset-level leverage restrictions and *dynamic* sector risk-weight adjustment approach. Indeed, these asset-level and dynamic approaches which are popular in India and some other Asian countries are useful for Basel committee and other Western regulators to consider in future financial reforms.

I then analyze transition risks to India from implementation of Dodd-Frank and Basel III reforms:

1. Banks, especially in the Eurozone, undergoing a slow “credit crunch” as they build capital through retained earnings rather than immediate recapitalization;
2. Flow of leverage and risk-taking to shadow banking world of hedge funds and asset managers, who are likely to chase fast-growing emerging markets but also withdraw flows rapidly when faced with home-country shocks;
3. Basel III’s liquidity requirements inducing a “bubble” in Eurozone sovereign bond holdings relative to worthiness of their credit, strangling – or making more expensive – government borrowing for other economies; and,
4. The rising cost of financial sector bailouts in the Eurozone, its spillover to sovereign balance-sheets, and its interaction with inadequately capitalized financial sector that is significantly exposed to sovereign bond holdings.

I conclude with some important lessons for regulation of financial section in India based on the crisis and proposed reforms in the aftermath:

1. Charge for government guarantees to the banking sector (especially the explicitly guaranteed, state-owned sector) and plan for a graceful exit to obtain a level-playing field in financial risk-taking;
2. Undertake a fully macro-prudential view of its financial sector regulation (covering not just banks but also “shadow banks”) so that the perimeter of leverage restrictions retains its sanctity;
3. Strive for a consensus amongst fast-growing emerging markets as well as in G20 for principles guiding systemic risk containment in the financial sector, which in turn can limit global spillover risks (such as Eurozone debt crisis);
4. Manage the government debt capacity and fiscal deficit in a counter-cyclical manner (relative to risks to rest of the economy), while also creating depth of institutions in credit and fixed-income markets to withstand economy-wide shocks and dampen the blow of equity-market’s volatility induced by portfolio flows exposed to global risks.

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² In interest of saving time, and avoiding offence to any other person whose work I have drawn upon but omitted unintentionally, I have only cited my own (co-authored) work in References. All relevant links, if of interest to the readers, are contained in that cited work.

I. The Dodd-Frank Act

The Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010, enacted by the Obama administration in the United States, is perhaps the most ambitious and far-reaching overhaul of financial regulation since the 1930s.

The backdrop for the Act is now well understood but worth an encore.

When a large part of the financial sector is funded with fragile, short-term debt and is hit by a common shock to its long-term assets, there can be *en masse* failures of financial firms and disruption of intermediation to households and corporations. Having witnessed such financial panics from the 1850s until the Great Depression, Senator Carter Glass and Congressman Henry Steagall pushed through the so-called Glass-Steagall provisions of the Banking Act of 1933. They put in place the Federal Deposit Insurance Corporation (FDIC) to prevent retail bank runs and to provide an orderly resolution of troubled depository institutions – “banks” – before they failed. To guard against the risk that banks might speculate at expense of the FDIC, they ring-fenced their permissible activities to commercial lending and trading in government bonds and general-obligation municipals, requiring the riskier capital markets activity to be spun off into investment banks.

At the time it was legislated, and for several decades thereafter, the Banking Act of 1933 reflected in some measure a sound economic approach to regulation:

- *identify the market failure*, or in other words, why the collective outcome of individual economic agents and institutions does not lead to socially efficient outcomes, which in this case reflected the financial fragility induced by depositor runs;
- *address the market failure through a government intervention*, in this case by insuring retail depositors against losses; and
- *recognize and contain the direct costs of intervention, as well as the indirect costs due to moral hazard arising from the intervention*, by charging banks upfront premiums for deposit insurance, restricting them from riskier and more cyclical investment banking activities, and through subsequent enhancements, requiring that troubled banks face a “prompt corrective action” that would bring about their orderly resolution at an early stage of their distress.

Over time, however, the banking industry nibbled at the perimeter of this regulatory design, the net effect of which was to keep the government guarantees in place but largely do away with any defense the system had against banks’ exploiting the guarantees to undertake excessive risks. What was perhaps an even more ominous development was that the light-touch era of regulation of the financial sector starting in the 1970s allowed a parallel (“shadow”) banking system, consisting of money market funds, investment banks, derivatives and securitization markets, etc., to evolve. The parallel banking sector that was both

opaque and highly leveraged and in many ways, reflected *regulatory arbitrage*, the opportunity and the propensity of the financial sector to adopt organizational forms and financial innovations that would circumvent the regulatory apparatus designed to contain bank risk-taking. Over time, the Banking Act began to be largely compromised.

Fast forward to 2004, which many argue was the year when a perfect storm began to develop that would eventually snare the global economy. Global banks were seeking out massive capital flows into the United States and the United Kingdom by engaging in short-term borrowing, increasingly through uninsured deposits and interbank liabilities, financed at historically low interest rates. They began to manufacture huge quantities of “tail risk,” that is, of small likelihood but catastrophic outcomes. A leading example was the so-called “safe assets” (such as the relatively senior – AAA-rated – tranches of subprime-backed mortgages) that would fail only if there was a secular collapse in the housing markets. As the large and complex financial institutions (LCFIs), were willing to pick up loans from originating mortgage lenders and pass them around or hold them on their own books after repackaging them, a credit boom was fueled in these economies. As Table 1 shows, over 20% of the US mortgage-backed exposure was guaranteed by “non-agencies”, that is, by the private sector (see last three columns before “Total”), but unlike traditional securitization – in which the AAA-tranches would get placed with the pension fund of proverbial Norwegian village – these were in a significant measure (originated *and*) retained by banks and thrifts, and broker-dealers (see the column in Table 1 highlighted in red).

The net result of all this was that the global banking balance sheet grew two-fold from 2004 to 2007, but its risk appeared small. The LCFIs had, in effect, taken a highly undercapitalized one-way bet on the housing market, joined in equal measure by the U.S. government’s own shadow banks – Fannie-Mae and Freddie-Mac, and AIG, the world’s largest insurer. While these institutions seemed individually safe, collectively they were vulnerable. And as the housing market crashed in 2007, the tail risk materialized, and the LCFIs crashed too like a house of cards. The first big banks to fail were in the shadow banking world. They were put on oxygen in the form of Fed assistance, but the strains in the interbank markets and the inherently poor quality of the underlying housing bets even in commercial bank portfolios, meant that when the oxygen ran out in the fall of 2008, some banks had to fail. A panic ensued internationally, making it clear that the entire global banking system was imperiled and needed – and markets expected them to be given – a taxpayer-funded lifeline.

	Loans	HELOC	Agency MBS	Non-Agency AAA	CDO Subord	Non CDO Subord	Total	
Banks & Thrifts	2,020	869	852	383	90		4,212	39%
GSEs & FHLB	444		741	308			1,493	14%
Brokers/dealers			49	100	130	24	303	3%
Financial Guarantors		62			100		162	2%
Insurance Companies			856	125	65	24	1,070	10%
Overseas			689	413	45	24	1,172	11%
Other	461	185	1,175	307	46	49	2,268	21%
Total	2,925	1,116	4,362	1,636	476	121	10,680	
	27%	10%	41%	15%	4%	1%		

Table 1: Distribution of the United States real-estate exposures, source – Lehman Brothers Fixed Income Report, June 2008

In the aftermath of this disaster, governments and regulators began to cast about for ways to prevent -- or render less likely -- its recurrence. The crisis created focus and led first to a bill from the House of Representatives, then one from the Senate that were combined and distilled into the *Dodd-Frank Act*. The critical task for the Dodd-Frank Act can be viewed as addressing the increasing propensity of the financial sector to put the entire system at risk and, eventually to be bailed out at taxpayer expense.

Here are the highlights of the Act:

- *Identifying and regulating systemic risk:* Sets up a Council that can deem non-bank financial firms as systemically important, regulate them and, as a last resort, break them up; also establishes an Office under the Treasury to collect, analyze and disseminate relevant information for anticipating future crises.
- *Proposing an end to too-big-to-fail:* Requires funeral plans and orderly liquidation procedures for unwinding of systemically important institutions, ruling out taxpayer funding of wind-downs and instead requiring that management of failing institutions be dismissed, wind-down costs be borne by shareholders and creditors, and if required, *ex post* levies be imposed on other (surviving) large financial firms.
- *Expanding the responsibility and authority of the Federal Reserve.* Grants the Fed authority over all systemic institutions and responsibility for preserving financial stability.
- *Restricting discretionary regulatory interventions:* Prevents or limits emergency federal assistance to individual non-bank institutions.

- *Reinstating a limited form of Glass-Steagall (the “Volcker rule”)*: Limits bank holding companies to *de minimis* investments in proprietary trading activities, such as hedge funds and private equity, and prohibits them from bailing out these investments.
- *Regulation and transparency of derivatives*: Provides for central clearing of standardized derivatives, regulation of complex ones that can remain over-the-counter (that is, outside of central clearing platforms), transparency of all derivatives, and separation of non-vanilla positions into well-capitalized subsidiaries, all with exceptions for derivatives used for commercial hedging.

In addition, the Act introduces a range of reforms for mortgage lending practices, hedge fund disclosure, conflict resolution at rating agencies, skin-in-the-game requirement for securitization, risk-taking by money market funds, and shareholder say on pay and governance. And perhaps its most popular reform, albeit secondary to the financial crisis, the Act creates a Bureau of Consumer Financial Protection that will write rules governing consumer financial services and products offered by banks and non-banks.

The Dodd-Frank Act: An Overall Assessment

The first reaction to the Act is that it certainly has its heart in the right place. It is highly encouraging that the purpose of the new financial sector regulation is explicitly aimed at developing tools to deal with systemically important institutions. And it strives to give prudential regulators the authority and the tools to deal with this risk. Requirement of funeral plans to unwind large, complex financial institutions should help demystify their organizational structure – and the attendant resolution challenges when they experience distress or fail. If the requirement is enforced well, it could serve as a “tax” on complexity, which seems to be another market failure in that private gains from it far exceed the social ones.

In the same vein, even though the final language in the Act is a highly diluted version of the original proposal, the Volcker rule limiting proprietary trading investments of LCFIs provides a more direct restriction on complexity and should help simplify their resolution. The Volcker rule also addresses the moral hazard that direct guarantees to commercial banks are largely designed to safeguard payment and settlement systems and to ensure robust lending to households and corporations, but that through the bank holding company structure, they effectively lower the costs for more cyclical and riskier functions such as making proprietary investments and running hedge funds or private equity funds, where there are thriving markets and commercial banking presence is not critical.

Equally welcome is the highly comprehensive overhaul of derivatives markets aimed at removing the veil of opacity that has led markets to seize up when a large derivatives dealer experiences problems (Bear Stearns, for example). The push for greater transparency of prices, volumes and exposures – to

regulators and in aggregated form to the public – should enable markets to deal better with counterparty risk, in terms of pricing it into bilateral contracts, as well as understanding its likely impact. The Act also pushes for greater transparency by making systemic non-bank firms subject to tighter scrutiny by the Fed and the SEC.

However, the Act requires over 225 new financial rules across 11 federal agencies. The attempt at regulatory consolidation has been minimal. In the end, the financial sector will have to live with the great deal of uncertainty that is left unresolved until the various regulators (the Fed, the SEC, and the Commodities and Futures Trading Commission (CFTC)) spell out the details of implementation.

Perhaps more importantly, from the standpoint of providing an economically sound and robust regulatory structure, the Act has weaknesses on at least four important counts, as we explain below. The net effect of these four basic faults is as follows: implicit government guarantees to the financial sector will persist in some pockets and escalate in some others; and capital allocation may migrate in time to these pockets and newer ones that will develop in the future in the shadow banking world and, potentially, sow seeds of the next significant crisis. Implementation of the Act and future regulation may guard against this danger, but that remains to be seen.

1. Government guarantees remain mispriced, leading to moral hazard.

In 1999, economists John Walter and John Weinberg, of the Federal Reserve Bank of Richmond, performed a study of how large the financial safety net was for U.S. financial institutions. Using fairly conservative criteria, they reported 45% of all liabilities (\$8.4 trillion) received some form of guarantee. A decade later, the study was updated by Nadezhda Malysheva and John Walter with staggering results -- now, 58% of all liabilities (\$25 trillion) was under a safety net. Without appropriate pricing, government guarantees are highly distortionary: They lead to subsidized financing of financial firms, moral hazard and the loss of market discipline, which, in turn, generate excessive risk-taking. Examples include FDIC insurance provided for depository institutions, implicit backing of the government sponsored enterprises (GSEs), Fannie Mae and Freddie Mac, and the much discussed too-big-to-fail mantra of LCFIs. The financial crisis of 2007-2009 exposed the depth of the problem with the failure of numerous banks and the need to replenish FDIC funds, the now explicit guarantee of GSE debt, and the extensive bailouts of LCFIs.

The Dodd-Frank Act makes little headway on the issue of government guarantees. While admittedly such guarantees have been a problem for many years, the Act nonetheless makes little attempt to readdress the pricing of deposit insurance. And while the GSEs are the most glaring examples of systemically important financial firms whose risk choices went awry given their access to

guaranteed debt, the Act makes no attempt to reform them.³ The distortion here is especially perverse, given the convenience of having them around to pursue political objectives of boosting subprime home ownership and using them as “bad” banks to avoid another titanic collapse of housing markets. Finally, there are several large insurance firms in the United States that can – and did in the past – build leverage through minimum guarantees in standard insurance contracts. Were these to fail, there is little provision in the Act to deal adequately with their policyholders: There are currently only the tiny state guarantee funds, which would never suffice for resolving the large insurance firms. Under the Act, there would be no *ex ante* systemic risk charges on these firms, but it is highly unlikely that their policyholders will be wiped out or that the large banks will be made to pay for these policies (as the Act proposes)! Taxpayer bailout of these policies is the more likely outcome. These institutions remain too-big-to-fail and could be the centers of the next excess and crisis.

Of course, proponents of the Act would argue that at least the issue of too-big-to-fail has been dealt with once and for all through the creation of an Orderly Liquidation Authority (OLA). But when one peels back the onion of the OLA, it is much less clear. Choosing an FDIC-based receivership model to unwind such large and complex firms creates much greater uncertainty than would a restructured Bankruptcy Code for LCFIs or the forced debt-to-equity conversions inherent in “living wills.” Time will tell whether the OLA is considered credible enough to impose losses on creditors (FDIC-insured depositors aside), but market prices of LCFI debt will be able to provide an immediate answer through a comparison of yield spreads with non-too-big-to-fail firms.

2. Individual firms are not sufficiently discouraged from putting the system at risk.

Since the failure of systemically important firms imposes costs beyond their own losses – to other financial firms, households, the real sector, and potentially, other countries -- it is not sufficient to simply wipe out their stakeholders – management, shareholders and creditors. These firms must pay in advance for contributing to the risk of the system. Not only does the Act rule this out, it makes the problem worse by requiring that other large financial firms pay for the costs, precisely at a time when they likely face the risk of contagion from failing firms. This is simply poor economic design for addressing the problem of externalities.

It is somewhat surprising that the Act has shied away from adopting an *ex ante* charge for systemic risk contributions of LCFIs. And, in fact, it has most likely compromised its ability to deal with their failures. It is highly incredible that in the midst of a significant crisis, there will be the political will to levy a discretionary charge on the surviving financial firms to recoup losses inflicted by failed firms: It would in fact be better to reward the surviving firms from the

³ For a detailed treatment of the role played by the GSEs in the housing boom and bust in the United States, see Acharya, van Nieuwerburgh, Richardson and White (2011).

standpoint of *ex ante* incentives and relax their financing constraints *ex post* to boost the flagging economic output in that scenario. Under the proposed scheme, therefore, the likely outcomes are that the financial sector will most likely not pay for its systemic risk contributions – as happened in the aftermath of this crisis -- and that to avoid any likelihood that they have to pay for others' mistakes and excesses, financial firms will herd by correlating their lending and investment choices. Both of these would increase, not decrease, systemic risk and financial fragility.

Equally problematic, the argument can be made that the Act has actually increased systemic risk in a financial crisis. While it is certainly true that the Financial Stability Oversight Council of regulators has more authority to address a systemic crisis as it emerges, there is the implicit assumption that the Council will have the wherewithal to proceed. Given the historical experience of regulatory failures, this seems like a tall order. In contrast, the Act reduces the ability of the Federal Reserve to provide liquidity to non-depository institutions, and, as mentioned above, provides no *ex ante* funding for solvent financial institutions hit by a significant event. The Council will be so restricted that its only choice in a liquidity crisis may be to put the systemically important firm through the OLA process, which, given the uncertainty about this process, could initiate a full-blown systemic crisis. Much greater clarity on exact procedures underlying the OLA would be necessary to avoid such an outcome.

3. The Act falls into the familiar trap of regulating by form, not function.

The most salient example of this trap is the Act's overall focus on bank holding companies, after clarifying that non-banks may get classified as systemically important institutions too and be regulated accordingly. As we just explained, the Act allows for provision of federal assistance to bank holding companies under certain conditions, but restricts such assistance to other systemically important firms, in particular, large swap dealers. This will create a push for the acquisition of small depositories just as non-banks anticipate trouble, undermining the intent of restriction. There are also important concentrations of systemic risk that will develop, for instance, as centralized clearing of derivatives starts being implemented. And when their systemic risk materializes, employing Fed's lender-of-last-resort function may be necessary, even if temporarily so, to ensure orderly resolution.

Consider a central clearinghouse of swaps (likely credit default swaps to start with, but eventually several other swaps, including interest rate swaps). As Mark Twain would put it, it makes sense to "put all one's eggs in a basket" and then "watch that basket." The Act allows for prudential standards to watch such a basket. But if the basket were on the verge of a precipitous fall, an emergency reaction would be needed to save the eggs – in this case, the counterparties of the clearinghouse. The restriction on emergency liquidity assistance from the Fed when a clearinghouse is in trouble will prove disastrous, as an orderly liquidation may take several weeks if not months. The most natural response in such cases is

to provide temporary federal assistance, eventual pass-through of the realized liquidation losses to participants on the clearinghouse, and its private recapitalization through capital contributions from participants. Why force intermediate liquidity assistance to go through a vote of the Council and have the markets deal with discretionary regulatory uncertainty?

4. Large parts of the shadow banking sector remain in current form.

The story of the financial crisis of 2007-2009 was that financial institutions exploited loopholes in capital requirements and regulatory oversight to perform risky activities that were otherwise meant to be well-capitalized and closely monitored. Examples are numerous: (i) financial firms' choosing unqualified regulatory agencies to oversee them (e.g., AIG's choice of OTS for its financial products group); (ii) the loading up of so-called AAA-rated securities in a regulatory setting ripe for conflict of interests between rating agencies, security issuers and investors; and (iii) the development of a parallel banking sector that used wholesale funding and OTC derivatives to conduct identical banking activities, as commercial banks yet were not subject to the same rules and regulations.

To be fair, the Dodd-Frank Act does not ignore all of this in its financial reform. For example, it makes major steps forward to deal with the regulatory reliance and conflict of interest problem with rating agencies, OTC derivatives are brought back into the fold, and leverage-enhancing tricks like off-balance-sheet financing are recognized as a major issue. But the basic principle that similar financial activities, or, for that matter, economically equivalent securities should be subject to the same regulatory rules is not core to the Act.

For example, several markets – such as the sale and repurchase agreements (repo) – that now constitute several trillion dollars of intermediation flows have been shown to be systemically important. In what sense, do these markets perform different functions than demand deposits and why aren't they regulated as such? Moreover, these markets can experience a freeze at large if a few financial firms are perceived to be risky but their exact identity is unknown. Orderly resolution of a freeze and prevention of fire-sale asset liquidations in these markets remains unplanned. And ditto for dealing with runs on money market funds whose redemption risk following the collapse of Lehman brought finance to a standstill. That a collection or herd of small contracts and markets can be systemically important is essentially lost in the Dodd-Frank Act as its focus is almost exclusively on the too-big-to-fail financial institutions.

In conclusion, while the Dodd-Frank Act does represent the culmination of several months of sincere effort on the part of the legislators, their staffers, the prudential regulators, academics, policy think-tanks, and of course, the financial industry (and the lobbyists!), it is important to recognize that the most ambitious overhaul of the financial sector regulation in our times does not fully address private incentives of individual institutions to put the system at risk, leaves a great

deal of uncertainty as to how we will resolve future crises, and is likely to be anachronistic, in parts, right from the day of its legislation.⁴

II. Basel III requirements

In response to the systemic effect of the failure of the relatively small German bank Herstatt in 1974, the central-bank Governors of the G10 established the Basel Committee on Banking Supervision. While having no statutory authority, the Basel Committee has emerged over the past 35 years as the go-to-group to formulate international standards for banking supervision, and especially capital adequacy requirements. This 35-year Basel process started with the 1988 Basel Accord (Basel I) which imposed the now infamous minimum ratio of capital to risk-weighted assets of 8 percent. The committee produced a revised framework in June 1999 which culminated in the implementation of the New Capital Framework in June 2004 (Basel II). Basel II expanded Basel I's capital requirement rules and introduced internal risk assessment processes. As a result of the financial crisis, the Basel Committee is at it again with proposals for new capital adequacy and liquidity requirements, denoted Basel III.

In terms of specifics, before outlining the broad strokes of the Basel III agreement, it is helpful to briefly review the earlier accords, as Basel III works iteratively off these.

The purpose of the Basel Accords is to provide a common risk-based assessment of bank assets and required capital levels. Basel I separated assets into categories and gave risk-weights ranging from 0% to 100% to each category. The risk-weighted assets are calculated by multiplying the sum of the assets in each category by these risk-weights. Banks then should hold a minimum ratio of 8% of capital to risk-weighted assets.

Because the risk analysis of Basel I was quite crude, Basel II refined this by (i) adding further gradation of risk categories, (ii) allowing for internal, and more sophisticated, risk models, and (iii) incorporating value-at-risk based capital charges for trading books. Even with the apparent improvements of Basel II, LCFIs, armed with their too-big-to-fail funding advantage, easily exploited the conflict of interests of rating agencies, played off external versus internal risk models, and minimized value-at-risk, though not systemic risk. Arguably, because the Basel II approach measured individual bank risk but ignored systemic risk (the primary rationale for bank regulation) and in addition did not address the fragility that was developing on the bank liability side in the form of uninsured wholesale deposit funding, the financial sector had a race to the bottom in risk-taking and economic leverage and ended up in the poor shape it was in the crisis.

Basel III recognizes that there are two types of risks that cause a financial firm to potentially fail:

- *Solvency or Capital risk*, that is, the market value of the firm's assets falls below its obligations, and/or

⁴ Not all is lost though, and these limitations can be fixed in due course. See a possible roadmap for addressing these limitations in Acharya, Cooley, Richardson and Walter (2010).

- *Liquidity risk*, that is, the firm cannot convert assets into cash to pay off its obligations because asset markets have become illiquid, or its close cousin, *funding liquidity risk*, that is, the firm is unable to roll over its maturing debt obligations with immediacy at some point in the future.

These risks can spread quickly through (i) fire sales, (ii) counterparty risk, or (iii) contagious runs, and systemic risk can engulf the financial sector in no time. To the extent that Basel I and II focused almost exclusively on solvency risk, and little on the liquidity risk, Basel III constitutes an improvement. However, Basel III is disappointing in that it never makes an effort to identify when an institution’s solvency risk or liquidity risk are likely to lead to systemic risk. By not differentiating so, it directly subsidizes those solvency and liquidity risks that contribute to system-wide risks versus those that do not.

In particular, while Basel III tries to correct some of these areas, the basic approach to regulation is essentially a follow-up on to Basel II. Specifically, Basel III (i) is stricter on what constitutes capital, (ii) introduces a minimum leverage ratio and, to be determined, higher capital requirements (possibly countercyclical in nature), and (iii) creates liquidity ratios that banks will eventually have to abide by.

With respect to systemic risk – the real issue at hand-, the July 2010 Basel committee report states that the committee will “undertake further development of the “guided discretion” approach as one possible mechanism for integrating the capital surcharge into the Financial Stability Board’s initiative for addressing systemically important financial institutions.” One would think systemic risk *should* be the primary focus of the regulatory guidelines, but somewhat surprisingly, even after the recent crisis, it is not!

Capital Requirements

The Basel III rules endorsed by the Group of 20 leading economies can be summarized as follows as far as new rules on the capital banks hold are concerned (see appendix for the full description of Basel III rules):

Table 2: Capital Adequacy Standards (Basel III)

Capital type/Year to abide rule by	2013	2019
Minimum equity capital ratio (pure stock)	3.5% of risk-weighted assets (RWA)	4.5% of RWA
Minimum Tier 1 capital (equity + other instruments, including some hybrid bonds)	4.5% of RWA	6% of RWA
Minimum total capital plus new “capital conservation buffer”	8% of RWA	10.5% of RWA

In particular, several hybrid instruments are being eliminated as eligible forms of capital, and Tier 3 capital is eliminated altogether, inducing a significant shift in bank liability structure, away from the hybrid capital, whose growth (especially in Europe) had been substantial in the pre-2007 period.

The rules, in response to the severe criticism received by the risk-weighted approach, put a floor under the build-up of leverage in the banking sector by requiring that capital to (un-weighted) assets be at least 3%. In addition, the plan is to introduce additional safeguards against model risk and measurement error by supplementing the risk-weighted assets measure with a simpler measure that is based on gross exposures.

In other – more specific but not fully spelled-out – changes, the risk coverage of the capital framework will be strengthened by requiring that the reforms

- Strengthen the capital requirements for counterparty credit exposures arising from banks' derivatives, repo and securities financing transactions; raise the capital buffers backing these exposures; provide additional incentives to move OTC derivative contracts to central counterparties (probably clearing houses); and, provide incentives to strengthen the risk management of counterparty credit exposures.
- Introduce a series of measures to promote the build-up of capital buffers in good times that can be drawn upon in periods of stress :
 - A series of measures to address pro-cyclicality: dampen any excess cyclicality of the minimum capital requirement; promote more forward looking provisions; conserve capital to build buffers at individual banks and the banking sector that can be used in stress.
 - Achieve the broader macro-prudential goal of protecting the banking sector from periods of excess credit growth: requirement to use long term data horizons to estimate probabilities of default, downturn loss-given-default estimates, recommended in Basel II, to become mandatory; improved calibration of the risk functions, which convert loss estimates into regulatory capital requirements; and, banks must conduct stress tests that include widening credit spreads in recessionary scenarios.
 - Promote stronger provisioning practices (forward looking provisioning) and advocate a change in the accounting standards towards an expected loss (EL) approach.

Liquidity Requirements

As discussed before, financial distress arises not just from capital risk but also liquidity risk. The financial crisis of 2007-2009 shows that liquidity risk deserves equal footing. The problem arises because regulated institutions as well as their unregulated siblings have fragile capital structures in that they hold assets with aggregate risk and long-term duration or low liquidity but their liabilities are highly short-term in nature. Arguably, the current crisis went pandemic when there was a run on the investment banks and money market funds after Lehman Brothers failed.

One solution is to impose liquidity requirements on financial institutions that are similar in spirit to the way capital requirements are imposed, with the intention of reducing runs. The basic idea would be to require that a proportion of the short-term funding must be in liquid assets, i.e., assets that can be sold immediately in quantity at current prices. This requirement might be sufficient to prevent runs as it will in effect increase the cost of financial institutions taking on carry trades and holding long-term asset backed securities.

The original December 2009 proposal in Basel III outlined two new ratios that financial institutions would be subject to:

- A *liquidity coverage ratio (LCR)*: the ratio of a bank's high quality liquid assets (i.e., cash, government securities, etc.) to its net cash outflows over a 30-day time period (i.e., outflows in retail deposits, wholesale funding, etc.) during a severe system wide shock. This ratio should exceed 100%.
- A *net stable funding ratio (NSFR)*: the ratio of the bank's available amount of stable funding (i.e., its capital, longer term liabilities and stable short-term deposits) over its required amount of stable funding (i.e., value of assets held multiplied by a factor representing the asset's liquidity). This ratio should exceed 100%.

The introduction of the LCR and NSFR as prudential standards has merit. Consider the example of the super senior AAA-rated tranches of collateralized debt obligations relative to a more standard AAA-rated marketable security (say, a corporate bond). Specifically, assume that the probability and magnitude of losses (i.e., the expected mean and variance) associated with default are similar between the two classes of securities. What are the implications of LCR and NSFR on these holdings?

Liquidity risk refers to the ability of the holder to convert the security or asset into cash. Even before the crisis started, the super senior tranches were considered to be less liquid than standard marketable securities and more of a hold-to-maturity type of security. The fact that these securities offered a spread should not be surprising, given that there are numerous documentations of a price to illiquidity. For instance, consider the well-documented spread between the off-the-run and on-the-run Treasuries. The LCR would most likely count the AAA-rated CDO less favorably in terms of satisfying liquidity risk.

Funding risk refers to the mismatch in the maturity of the assets and liabilities. There is a tendency for financial institutions to hold long-term assets using cheap short-term funding, a kind of a "carry trade." But this exposes the institution to greater risk of a run if short-term funding evaporates during a crisis. These two points suggest that it would be useful to know the "liquid" assets the financial institution holds against short-term funding. One could imagine that the higher the ratio, the less an institution is subject to a liquidity shock, and therefore the less risky it is. The NSFR would help answer this question, and again would be less favorable for the AAA-rated CDO versus the AAA-rated marketable security.

Basel Capital Requirements: An Assessment

From a conceptual standpoint, the Basel capital requirements are a flawed macro-prudential tool. Here's why. First and foremost, a macro-prudential tool should be concerned with – and attempt – to address systemic risk contributions of financial firms. Basel requirements, for most part, are focused instead on individual risk of financial firms.

Second, the very act of reducing the individual risk of financial firms, can in principle, aggravate systemic risk. For instance, if institutions cannot diversify perfectly, but are encouraged to do so at all costs, then they can all be left holding the same aggregate risk as they diversify away all idiosyncratic risk. If the costs to bank failures are non-linearly increasing in number of failures, then diversification could in fact be welfare-reducing in this form. A good analogy to this general point is banks holding AAA-rated tranches to hold a diversified bet on the housing market, since such a diversified bet was rewarded by Basel requirements in terms of capital regulations relative to holding the underlying mortgages on banking books.

Third, even if one ignored the possibility of individual financial firms becoming more correlated as they reduce their own risks, Basel requirements ignore the *endogenous* or *dynamic* evolution of risks of the underlying assets. Consider again the case of AAA-backed residential MBS. By providing a relative advantage to this asset class, the Basel requirements explicitly encouraged greater lending in the aggregate to residential mortgages. As banks lent down the quality curve, they made worse mortgages (e.g., in terms of loan to value ratios). Hence, even though the residential mortgage as an asset class had historically been stable, a static risk-weight that favored this asset class made it endogenously riskier.

Finally, just as the Basel requirements ignore that they increase correlated investments and endogenously produce deteriorating asset quality on a risk-favored asset class, they also ignore that when the risk of this asset class materializes, since the financial firms are over-leveraged on this asset class and in a correlated manner, they face endogenous liquidity risk. For instance, as each financial firm attempts to de-leverage by selling its AAA MBS, so is every other financial firm, implying that there is not enough capital in the system to deal with the de-leveraging, and systemic risk is created, not only *ex ante*, but also *ex post*. In this sense, Basel requirements induce pro-cyclicality over and above the fact that risks are inherently pro-cyclical.

In economic parlance, Basel risk-weights approach is an attempt to target relative prices for lending and investments of banks, rather than restrict quantities or asset risks directly. Regulators – in absence of the price-discovery provided by day-to-day markets – can have little hope in achieving relative price efficiency that is sufficiently dynamic and reflective of underlying risks and the risks that risks will change. In contrast, concentration limits on asset class exposure for the economy as a whole, or simple leverage restriction (assets to equity of each financial firm not greater than 15:1, for instance), or an asset risk restriction (loan-to-value of mortgages not to exceed 80%, for

instance), are more likely to be robust and counter-cyclical macro-prudential tools. They do not directly address systemic risk but at least offer hope of limiting risks of individual financial firms and asset classes.

To see these grave limitations of current Basel approach to capital requirements, consider the following analysis of financial firms and their risk-taking in the context of the crisis of 2007-09.

Table 3 shows the 12 largest write-downs (and credit losses) of U.S. financial institutions from June 2007 (the beginning of the crisis) until March of 2010. For example, the top six firms combined for a total of \$696 billion in losses. Of some note, five of these six firms received the largest bailouts (Wachovia was acquired by Wells Fargo). Although, prior to their failure, most of these financial institutions were still considered to be “well-capitalized” by regulatory agencies, the market clearly thought differently. The last column in Table 3 shows that, from June 2007 to December 2008, the market values of these six firms dropped precipitously, averaging -88.71%. Moreover, during this period, any part of the financial sector in which major institutions fell short of capital – special purpose vehicles, such as conduits and structured investment vehicles or SIVs (in August 2007), independent broker-dealers (in March and September of 2008), money market funds (in September 2008) and hedge funds – faced massive runs on their short-term liabilities.³ By Fall 2008 and Winter 2009, systemic risk had fully emerged and the real economy was suffering the consequences.

Table 3: Largest Write-downs for U.S. Financial Firms (June’07 – March ’10)

Source: Bloomberg

Firm	Writedowns & Credit Losses (\$ billions)	Equity Return (June ‘07- Dec’08)	Equity Return (June’ 07 – Sept 16’08)
Fannie Mae	151.4	-98.14%	-99.23%
Citigroup	130.4	-82.46%	-67.20%
Freddie Mac	118.1	-97.98%	-99.56%
Wachovia	101.9	-88.34%	-73.18%
Bank of America	97.6	-67.79%	-34.35%
A.I.G	97.0	-97.57%	-94.50%
JP Morgan	69.0	-31.51%	-12.13%
Merrill Lynch	55.9	-85.16%	-72.45%
Wells Fargo	47.4	-10.77%	4.47%
Washington Mutual	45.3	-99.95%	-90.07%
National City	25.2	-94.29%	-86.61%
Morgan Stanley	23.4	-75.99%	-57.65%

This finding begs the obvious question, and one that regulators must grapple with: why, under the Basel core capital requirement of capital to risk-weighted assets ratio of 8%, did the top 20 US banks look “safe”, averaging a ratio of 11.7%? And even more striking, and based on their last quarterly disclosure documents, why did the five largest LCFIs that were subject to Basel rules and effectively failed during the crisis – Bear Stearns, Washington Mutual, Lehman Brothers, Wachovia and Merrill Lynch – all have capital ratios between 12.3% to 16.1%? Something was clearly amiss.

To understand what went wrong from a *regulatory* capital point of view in the pre-2007 period, note that the LCFIs took their leveraged bet using regulatory arbitrage tricks as a direct result of Basel I and II: First, they funded portfolios of risky loans via off-balance sheet vehicles (conduits and structured investment vehicles (SIVs)). These loans, however, were guaranteed by sponsoring LCFIs through liquidity enhancements that had lower capital requirement by Basel; so the loans were effectively recourse but had a lower capital charge, even though the credit risk never left the sponsoring LCFIs. Second, they made outright purchases of AAA-tranches of non-prime securities, which were treated as having low credit risk and zero liquidity and funding risk. Third, they enjoyed full capital relief on AAA-tranches if they bought “underpriced” protection on securitized products from monolines and AIG (both of which were not subject to similar prudential standards). Fourth, in August 2004, investment banks successfully lobbied the SEC to amend the net capital rule of the Securities Exchange Act of 1934, which effectively allowed for leverage to increase in return for greater supervision. This lobbying was in direct response to the internal risk management rules of Basel II.

Let us consider a few of these observations in greater detail.

One of the two principal means for “regulatory arbitrage” under the Basel accords was the creation of off-balance-sheet vehicles, which held onto many of the asset-backed securities they helped issue in the market. With securitized loans placed in these vehicles rather than on a bank’s balance sheet, the bank did not need to maintain any significant capital against them. However, the conduits funded the asset-backed securities by asset-backed commercial paper (ABCP) – short-term, typically less than one-week maturity, debt instruments sold in the financial markets, notably to investors in money market instruments. To be able to sell the ABCP, a bank would have to provide the buyers, i.e., the banks’ “counterparties,” with *guarantees* on the underlying credit – essentially bringing the risk back to the banks themselves, even though that risk was not shown on their balance sheets (see Acharya, Schnabl and Suarez, 2009).

These guarantees had two important effects. First, guaranteeing the risk to banks’ counterparties was essential in moving these assets off the banks’ balance sheets. Designing the guarantees as “liquidity enhancements” with a maturity less than one year (to be rolled over each year) allowed the banks to exploit a loophole in Basel capital requirements. In fact, almost all of these had a 364-day maturity. The design effectively eliminated the “capital charge” from retaining the risk of these loans, so that banks achieved a tenfold increase in leverage for a given pool of loans. Second, the guarantees ensured the highest ratings for the off-balance sheet vehicles from the rating agencies. Indeed, the AAA ratings made it possible for banks to sell ABCP to money-market funds, which are required by law to invest mainly in short-term and the highest-rated paper. This

allowed banks to fund the ABCP at low interest rates, similar to that paid on deposit accounts.

Acharya, Schnabl and Suarez (2009) document an increase in the ABCP market from around \$600 billion in 2004 to \$1.2 trillion in the second quarter of 2007 (just prior to the start of the financial crisis). When the collapse occurred in the next quarter, the cost of issuing ABCP rose from just 15 basis points over the Federal Funds rate to over 100 basis points (at its peak being close to 150 basis points). Consequently, the ABCP could no longer be rolled over, and the banks had to return the loans to their balance sheets. Acharya, Schnabl and Suarez (2009) show that when the crisis hit, of the \$1.25 trillion in asset-backed securitized vehicles, only 4.3 percent of the loss was structured to remain with investors. The remaining loss wiped out significant portions of bank capital and threatened banks' solvency.

Off-balance sheet financing was not the only way banks performed “regulatory arbitrage” against the Basel rules. In the second approach, a bank would still make loans and move them from its balance sheet by securitizing them. The bank then turned around and reinvested in AAA-rated tranches of the same securitized products they (or other banks) had created. Because of their AAA ratings, these securities had a significantly lower capital requirement under the Basel II arrangement. For commercial banks, the Basel accord weighted the risk of AAA-rated securities at less than half of the risk of ordinary commercial or mortgage loans, and thus required an even lower capital reserve for them (a 20% risk weight compared to 50% for mortgages and 100% for corporate bonds). In 2004, the Securities Exchange Commission (SEC) granted stand-alone American investment banks the ability to employ internal models to assess credit risk and the corresponding capital charge. This allowed them to take on even higher leverage than commercial banks, with leverage duly skyrocketing from a 22:1 debt to equity ratio to 33:1 within just three years.

In fact, as Lehman Brothers report from April 2008 showed (Table 1), banks and thrifts, GSEs (Fannie and Freddie), and broker/dealers in 2007 held \$789 billion of the AAA-rated CDO tranches that were backed by nonprime loans, or approximately 50 percent of the volume outstanding at the time. Moreover, the majority of the subordinated tranches of the CDOs were also held by banks, broker/dealers, and monoline insurers (which insure only one type of bond – e.g., municipal bonds). They collectively held \$320 billion of the \$476 billion total outstanding.

Lastly, in terms of regulatory arbitrage to get around the Basel rules, the role played by monoline insurers and A.I.G. cannot be overstated. In particular, credit protection in the form of credit default swaps (CDS) purchased from AAA-rated insurers on AAA-rated securities led to a 0% capital weight on these securities in the portfolio of banks' balance sheets. In other words, even though the spread on the securities over the bank's funding rate adjusted for the CDS was greater than zero, the capital charge was zero. No wonder LCFIs loaded up on these asset-backed securities. For example, on page 122 of A.I.G.'s 2007 annual report, AIG reports that \$379 billion of its \$527 billion credit default swap exposure on AAA-rated asset-backed securities written by its now infamous financial products group was written not for hedging purposes but to facilitate regulatory capital relief for (mainly European) financial institutions.

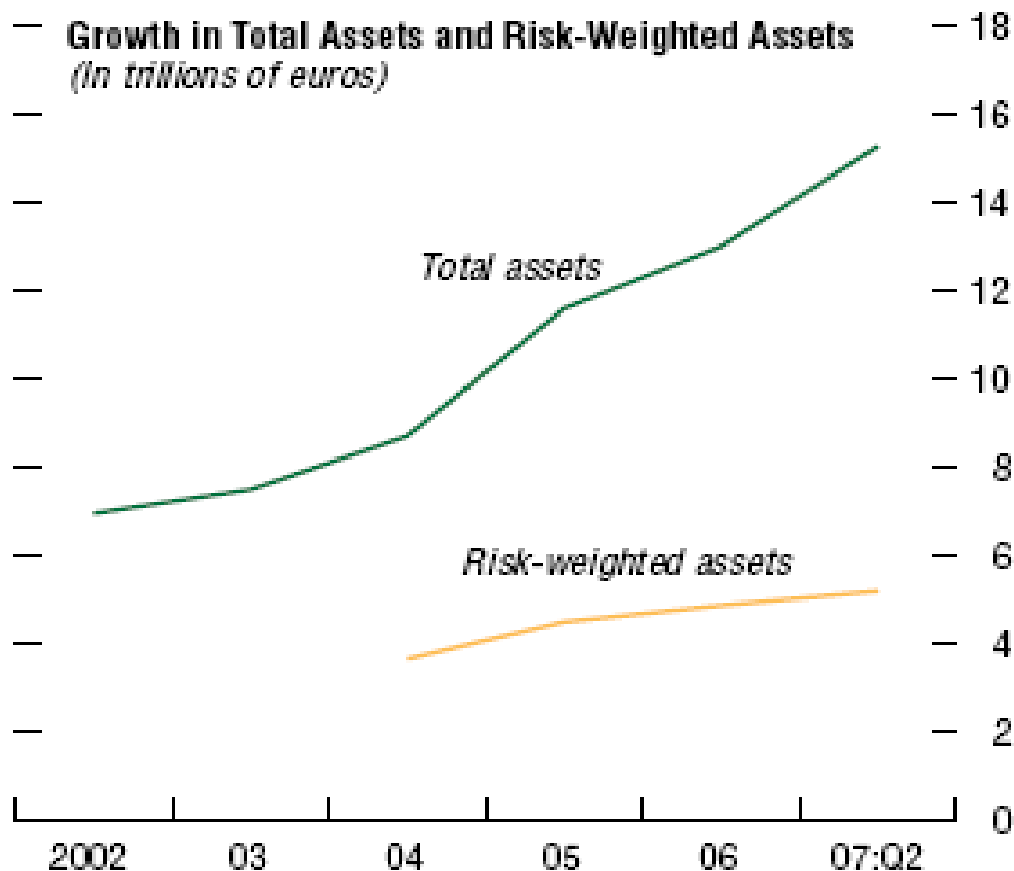
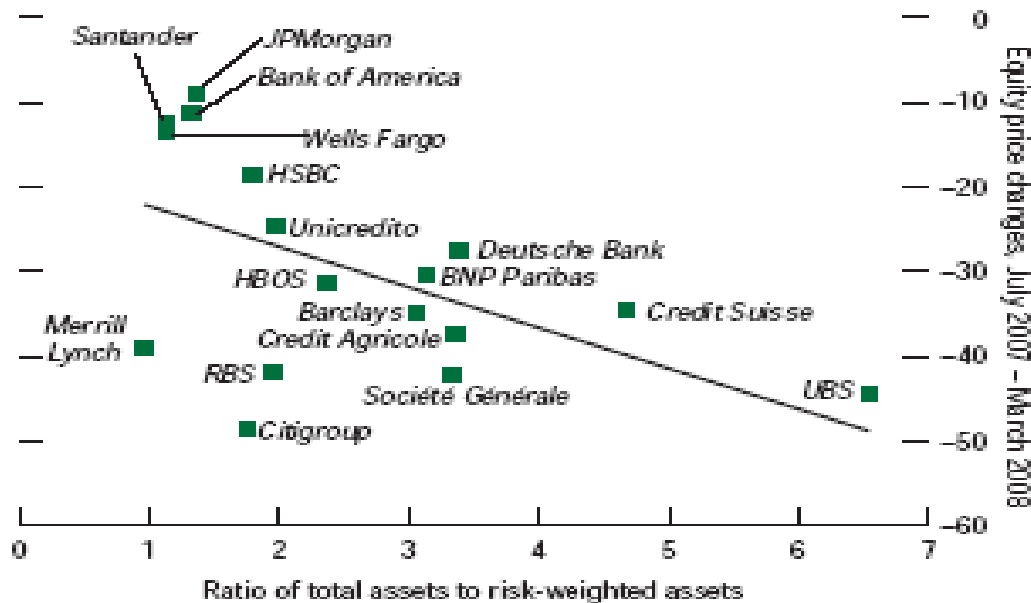


Figure 1: Source - IMF GFSR (April 2008), based on balance-sheets of ten largest global financial institutions

The net effect of arbitrating Basel’s capital requirements was that global banking balance sheets doubled from 2004 to 2007 with only a minor increase in Basel-implied risk (see Figure 1 from the IMF’s Global Financial Stability Report, April 2008). This fact alone should have signaled a red flag to regulators. When one combines this fact with the growth in short-term shadow banking liabilities from \$10 trillion to \$20 trillion between 2000 and 2007 (compared to \$5.5 trillion to \$11 trillion in traditional bank liabilities), it is clear in hindsight that the focus of Basel capital requirements over the prior 30 years has been misplaced.

In fact, as illustrated in Table 3 and also depicted graphically in Figure 2, financial firms that had the best regulatory capital ratios (effectively, due to substantial regulatory arbitrage), fared the worst in terms of market capitalization declines during the crisis. In other words, their high regulatory capital ratios, e.g., low un-weighted assets to risk-weighted assets ratio in Figure 2, were not a sign of their financial stability, but ironically a sign of their propensity to hold onto systemically-risky assets with maximum economic leverage (such as by holding AAA-rated residential MBS that had little Basel capital charge).

Figure 1.17. Bank Equity Price Changes and Balance Sheet Leverage
(In percent)



Sources: Bloomberg L.P.; and IMF staff estimates.

Figure 2: Source - IMF GFSR (April 2008)

Somewhat surprisingly, rather than the Basel committee providing a mea culpa, the response of the Basel committee has been to offer a new set of rules and guidelines that, in many ways, mirror the previous two attempts. While the Basel III process focuses on using more stringent capital requirements to get around some of these issues, it ignores the crucial market and regulatory failures of the financial system:

- While recognizing the systemic risk of financial firms, the Basel approach very much remains focused on the risk of the individual institution and not the system as a whole. In other words, the level of a firm’s capital requirements in Basel I, II or III does not depend on its interaction with other financial firms.
- Whatever capital and/or liquidity requirements are placed on one set of financial institutions – say banks and bank holding companies – it is highly likely that the financial activities affected by these requirements will just move elsewhere in the shadow banking system. That is, without the understanding that the whole financial system must be looked at and treated in unison, Basel III will run into the same shadow banking issues that arose with Basel I and II.
- There seems to be no recognition of the role government guarantees play in the allocation of capital. Ceteris paribus, the more guarantees a firm receives, the lower its costs of debt funding. This artificially increases the relative cost

of nonguaranteed funding like equity, preferred stock, and possibly subordinated debt (under a credible resolution authority).

Also problematic is that the Basel process sticks with tired old definitions of capital and leverage not entirely suitable for modern-day financial firms and for reducing excessive systemic risk. At the time they were designed, the primary purpose of Basel capital requirements was to guard the retail deposit base of commercial banks from unexpected losses on their loan portfolios. While Basel II has made improvements over Basel I by addressing over-the-counter (OTC) derivative positions, and Basel III has tightened the treatment of off-balance sheet financing, the focus is still not to measure quantities that actually reflect systemic risk, such as the change in the value of the financial firm's assets given a macroeconomic-wide shock and the impact such a shock has on its liability and funding structure.

That liquidity risk is now at the forefront of Basel III, and presumably future financial regulation in the U.S. as a result of the Dodd-Frank Act, is clearly a step forward. The LCR and NSFR liquidity adequacy standards are reasonable approaches towards the regulation of liquidity risk. For example, the focus of the LCR on a system wide stress scenario is the appropriate way to think about the systemic consequences of holding less liquid assets and/or funding those assets with short-term liabilities.

That said, the approach is eerily similar to that of Basel I, II and III for setting capital requirements. All the adjustment factors and weights used in calculating the LCR and NSFR have their counterpart in the risk-weights of capital ratios. Without a doubt, implementation of the liquidity ratios will push banks towards regulatory arbitrage of the liquidity weights, in particular, to the *best-treated* illiquid securities and systemically risky funding. Of course, the unintended consequence will be a concentration into these activities. Regulators should be acutely aware of this problem and be prepared ex ante to adapt in an expedited way.

The other problem is that the liquidity rules do not seem to take into account the impact a liquidity crisis at one bank has on the financial sector as a whole, especially in a crisis. In other words, banks that contribute more to system wide liquidity events (in a crisis) should be charged for this negative externality.

Further, regulators need to be aware that once the LCR and NSFR are imposed on a subset of financial institutions, then these activities will migrate to a part of the financial sector not subject to these requirements. Regulators need to look at the financial system in the aggregate.

Finally, a significantly problematic issue with Basel III's specific implementation of liquidity risk management is whether the risk weights on government bonds are suitably calibrated for the emerging sovereign credit risk in European zone countries, which imply that many securities which would traditionally have been both liquid and safe, are liquid now (due to central bank collateral qualification) but significantly credit-risky. I will focus on this point in great detail while focusing on the "transition risk" associated with financial sector's adoption of Dodd-Frank and Basel III requirements.

III. Contrast of Basel III with the Dodd-Frank Act

Consider the contrast of Basel III with Dodd-Frank Act. As part of the broad mandate given to regulators, the Dodd-Frank Act calls for stricter prudential standards for systemically important institutions. Moreover, these standards should be increasing in stringency based on factors such as leverage, off-balance sheet exposures, amount of short-term funding, interconnectedness, etc. These additional standards may include:

“ (A) risk-based capital requirements; (B) leverage limits; (C) liquidity requirements; (D) resolution plan and credit exposure report requirements; (E) concentration limits; (F) a contingent capital requirement; (G) enhanced public disclosures; (H) short-term debt limits; and (I) overall risk management requirements.”

Of the nine recommendations for stricter regulation, note that five include additional capital, contingent capital,⁵ or liquidity requirements. The basic idea is that, to the extent these stricter standards impose costs on financial firms, these firms will have an incentive to avoid them and therefore be less systemically risky. While the underlying premise is promising from purely a systemic risk viewpoint, our concern is that these standards may not be sufficient to get financial firms to internalize the costs of the systemic risk produced. *The glaring omission is any direct reference to the co-movement of an individual firm's assets with the aggregate financial sector in a crisis.*

Also, like Basel III, Dodd-Frank Act also provides for an explicit minimum leverage ratio – capital over total assets, along with minimum capital ratios - capital over risk-weighted assets. Specifically, the Dodd-Frank Act states that

“The appropriate Federal banking agencies shall establish minimum leverage (and risk-based) capital requirements on a consolidated basis for insured depository institutions, depository institution holding companies, and nonbank financial companies supervised by the Board of Governors. The minimum leverage (and risk-based) capital requirements established under this paragraph shall not be less than the generally applicable leverage (and 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 leverage (and risk-based) capital requirements that were in effect for insured depository institutions as of the date of enactment of this Act.”

In other words, the risk-based capital and leverage capital ratios applicable to FDIC-insured depository institutions will be applied to bank holding companies and systemically important institutions. Since these ratios represent a minimum standard, other regulatory guidelines, such as Basel III, could still be viable as long as their rules were stricter. Table 4 provides the current ratios for depository institutions. Of some note, these requirements are to be enacted within 18 months, though small institutions are generally exempt. It is also the case that to the extent a financial institution is deemed

⁵ See Chapter 6 “Capital, Contingent Capital and Liquidity Requirements” by Viral Acharya, Nirupama Kulkarni and Matthew Richardson, in Acharya, Cooley, Richardson and Walter (2010).

systemically important, the Federal Reserve may also exempt that institution if the capital and leverage requirements are not appropriate.

Table 4: Capital Adequacy Standards (Dodd-Frank Act)

	Well Capitalized	Adequately Capitalized
Tier 1 (risk-based capital ratio)	6%	4%
Total (risk-based capital ratio)	10%	8%
Leverage ratio	5%	4%

While the definitions of capital in the Dodd-Frank Act and Basel III don't perfectly coincide (so the comparison is not perfect), the proposed leverage ratio in Basel III is actually lower, i.e., 3%. The Dodd-Frank Act goes further still by requiring that bank holding companies with at least \$50 billion in assets or systemically important institutions "maintain a debt to equity ratio of no more than 15 to 1 (or a leverage ratio of at least 6.5%), upon a determination by the Council that such company poses a grave threat to the financial stability of the United States and that the imposition of such requirement is necessary to mitigate the risk that such company poses to the financial stability of the United States".

Along with the possible recommendation for more stringent capital requirements for systemically important financial institutions, the Act explicitly calls for additional capital requirements for depository institutions, bank holding companies and systemically important nonbank financial companies that address systemic risk arising from "(i) significant volumes of activity in derivatives, securitized products purchased and sold, financial guarantees purchased and sold, securities borrowing and lending, and repurchase agreements and reverse repurchase agreements; (ii) concentrations in assets for which the values presented in financial reports are based on models rather than historical cost or prices deriving from deep and liquid two-way markets; and (iii) concentrations in market share for any activity that would substantially disrupt financial markets if the institution is forced to unexpectedly cease the activity."

Further, and much unlike Basel III, Dodd-Frank recognizes that systemic risk of assets and balance-sheets can vary over time, both due to change in underlying risk of assets and collective shifts in risk-choices of financial firms. A possible approach to dynamically adjust to such variations is to periodically project losses of the financial sector into infrequent but plausible future scenarios, assess whether the financial sector has capital to be able to withstand these losses, and in case of capital shortfalls, decide on an early recapitalization plan. In order to be able to project into infrequent future scenarios, such scenarios need to be modeled and considered in the first place. An attractive way of dealing with such projection is to conduct "stress tests" – along the lines of the Supervisory Capital Assessment Program (SCAP) exercise conducted by the Federal Reserve during February to May 2009. To report its objectives and findings, I quote from the SCAP report:

“From the macro-prudential perspective, the SCAP was a top-down analysis of the largest bank holding companies (BHCs), representing a majority of the U.S. banking system, with an explicit goal to facilitate aggregate lending. The SCAP applied a common, probabilistic scenario analysis for all participating BHCs and looked beyond the traditional accounting-based measures to determine the needed capital buffer. The macro-prudential goal was to credibly reduce the probability of the tail outcome, but the analysis began at the micro-prudential level with detailed and idiosyncratic data on the risks and exposures of each participating BHC. This firm-specific, granular data allowed tailored analysis that led to differentiation and BHC-specific policy actions, e.g., a positive identified SCAP buffer for 10 BHCs and no need for a buffer for the remaining nine.”

The Dodd-Frank Act calls for systemic institutions to be subject to periodic stress tests:

“The Board of Governors, in coordination with the appropriate primary financial regulatory agencies and the Federal Insurance Office, shall conduct annual analyses in which nonbank financial companies supervised by the Board of Governors and bank holding companies described in subsection (a) are subject to evaluation of whether such companies have the capital, on a total consolidated basis, necessary to absorb losses as a result of adverse economic conditions.”

Moreover, systemically important financial institutions are required to perform semi-annual tests. Such assessments should be done more frequently in a crisis and may complement the firm’s own test. There has been valuable knowledge and experience developed in the exercise of SCAP 2009, and this could be built upon by the regulators in the United States. The recent decision to determine whether bank holding companies should resume dividend payouts – and by how much – was done based on a stress test (though transparency of this stress test in 2011 was lower than that of SCAP in 2009). Bank of America was one bank holding company that was not allowed to resume its dividends, whereas most others were.

One specific, and generally sensible, rule that appears in both the Dodd-Frank Act and Basel III is “in establishing capital regulations. . . , the Board shall seek to make such requirements countercyclical, so that the amount of capital required to be maintained by a company increases in times of economic expansion and decreases in times of economic contraction, consistent with the safety and soundness of the company.” While Basel III is currently short on specifics, it is clear countercyclical capital adequacy standards will be a key component of both Dodd-Frank and Basel III.

One way of implementing countercyclical regulation is to ensure financial firms are well-capitalized against their losses in stress tests, where stress scenario severity is not adjusted to be moderate even in good times or booms. Another way, what is appearing the proposed Basel III approach, is to expand (shrink) the size of the capital conservation buffer in each economy if there is a positive (negative) deviation of the

credit-to-GDP ratio with respect to certain pre-specified thresholds, such as its trend (other macro-economic variables or group of variables are also candidates “to assess the extent to which in any given jurisdiction there was a significant risk that credit had grown to excessive levels”). While research is on its way to determine if these are sensible ideas, emerging evidence suggests that tying capital requirements to GDP growth rather than to credit-to-GDP deviations from trend produces more countercyclical capital buffers.

On liquidity requirements, while the Dodd-Frank Act explicitly calls for the regulator to take into account “the amount and types of the liabilities of the company, including the degree of reliance on short-term funding” in setting prudential standards for systemically important institutions, and for these standards to include among others “liquidity requirements” and “short-term debt limits”, there are no other specifics. These are left to the Federal Reserve and other regulators. It is reasonable to infer, however, that the U.S. regulators will look to the new liquidity requirements as part of Basel III.

Overall, the details of Dodd-Frank implementation are, perhaps rightly so, left to the regulators. While the Act’s recommendations will be implemented later by the Federal Reserve, it is clear that bank holding companies with more than \$50 billion in assets, or systemically important nonbank financial companies (as assigned by the Financial Stability Oversight Council), will be subject to these, as of yet unknown additional capital and liquidity adequacy standards.

That said, it does seem to be the case that some significant improvements are possible by (i) closing major capital loopholes, and (ii) relying less on rating agencies. With respect to the loopholes, a good rule of thumb is that if off-balance sheet financing is effectively recourse to the banks, then the capital at risk should be treated as such. Moreover, counterparty credit risk exposures to financial firms, including OTC derivatives and securities financing transactions, should also be taken into account. While Basel II did expand the notion of risk for financial institutions, in hindsight the accord chose simplicity over accuracy in the determination of how capital should be treated. As for the reliance on ratings, it seems reasonable to consider not only (ii) the credit risk of defaultable assets (as defined by rating agencies), but also liquidity (funding and market) and specification risks.

The Dodd-Frank Act does make considerable progress on these fronts by:

- Addressing the conflict of interest inherent in the rating agency business model and the government’s regulatory reliance on ratings (HR 4173, Title IX “Investor Protection and Improvements to the Regulation of Securities”, Subtitle C “Improvements to the Regulation of Credit Rating Agencies
- Including off-balance sheet activities in computing capital requirements. (HR 4173, Title I, Subtitle C “Additional Board of Governors Authority for Certain Nonbank Financial Companies and Bank Holding Companies”, Sec 165 “Enhanced supervision and prudential standards for nonbank financial companies supervised by the Board of Governors and certain bank holding companies”.)
- And with respect to derivatives: (i) requiring margin requirements which are centrally cleared or over-the-counter, (ii) reporting to data repositories and

real-time price-volume transparency, and (iii) providing authority for prudential regulators to consider setting position limits and penalizing engaging in derivatives whose purpose is “evasive”.

Missing from the Dodd-Frank Act, however, is any recognition (except in the case of OTC derivatives) that, once these standards are imposed on one set of financial institutions, financial activity most likely will move elsewhere in the financial system to firms not subject to these standards. Of course, this reallocation would not be a problem if the systemic risk is reduced by separating it from core functions of financial intermediaries. The recent financial crisis, however, tells a different tale as much of the systemic risk emerged from the shadow banking system, which is both less regulated and less subject to capital and liquidity requirements albeit with weaker government guarantees.

Nevertheless, on balance, Dodd-Frank Act in the United States leaves open greater possibilities for the regulators to address systemic risk through capital requirements, for instance, by identifying a set of institutions as systemically important (SIFIs), and undertaking periodic stress tests to ensure these institutions are well-capitalized in aggregate stress scenarios. While the Basel Committee of Banking Supervision is also designating a list of Global SIFIs, the overall Basel III approach is to rely primarily on risk-weighted assets, with a capital conservation buffer. The BCBS does mention stress tests but at bank level – rather than subjecting banking sector as a whole to common stress as would be necessary for tying capital requirements to systemic risk, and the BCBS is still reviewing – with no immediate clarity – the need for additional capital, liquidity or supervisory measures to reduce the externalities created by systemically important institutions (G-SIFIs).

IV. What if Dodd-Frank and Basel III had been in place pre-crisis?

One important exercise is to ask whether the risk of future financial crises – arising from propensity of the financial sector to manufacture tail risks – as witnessed in the pre-2007 phase, has been sufficiently controlled given the Dodd-Frank Act and Basel III. If not, globally interconnected economies (such as India) should build their own significant safeguards against spillovers from such crises in future.

Consider first the following set of questions: How effective would these reforms have been, starting in 2003-2004 (years during which the housing credit boom took hold) and until the fall of 2008 (when the financial system had to be rescued)? Would they have prevented the enormous buildup of leverage on financial balance sheets all betting against a material correction in the U.S. housing market?

Let's go back to 2003. One of the most staggering statistics of the credit boom (see Figure 1 from IMF Global Financial Stability Report, April 2008) was that the balance sheet size of the ten largest global banks more than doubled, from about €7 trillion to €15 trillion during this period. And, during the same period, the regulatory assessment of the risk on their balance sheets (assessed for computing the banks' Tier-1 capital), moved far more gradually from €3.5 trillion to under €5 trillion. The system was deemed to be very well capitalized in the second quarter of 2007 -- indeed, better capitalized by this standard than in 2003. Something was clearly amiss.

The apparent safety of the financial sector's collective balance sheet was attributable to the fact that the biggest global banks had amassed vast quantities of AAA-rated ("safe") tranches backed by residential mortgages. These assets had historically been safer than similarly rated corporate loans. This was the principal reason behind their lower risk charge (by a factor of five) under the Basel capital requirements that were in place for European banks, for allowing the U.S. commercial banks to park these in off-balance sheet vehicles with little capital, and letting investment banks use internal models for risk management that largely ignored the tail risk of a secular housing collapse.

Even accepting that the AAA-rated mortgage-backed securities (MBS) were indeed safer than corporate loans at the time – in itself a strong assumption for the period ahead – regulatory capital requirements ignored the fact that the entire system was at risk to a common shock, the risk that mortgage defaults could reach levels at which AAA-rated tranches could take some losses. Such financial fragility – the extraordinarily high level of exposure of the system to a common asset shock – is not being sufficiently discouraged by the Dodd-Frank Act.

True, the Dodd-Frank Act will require systemically important financial institutions ("SIFIs") to be identified and to be subjected to higher capital and liquidity requirements. But these requirements are unlikely to be raised in the near future, given the weak state of global economic recovery. Nevertheless, suppose a new 8% Tier-1 capital requirement had existed in place of the actual 4% in 2003. Would that have effectively curbed mortgage lending?

The problem in the buildup to the credit crisis was not the *level* of the capital requirement but its *form*. Suppose the level of the capital requirement is raised but there is no change in the Basel risk weights. The AAA-rated MBS would continue to enjoy a one-fifth risk-weight charge, compared with AAA-rated corporate loans. Consequently, the basic distortion favoring mortgage finance in the economy would remain. Worse, by raising the capital requirement, bankers face a lower return on equity (ROE). So to restore their ROE, bankers would tilt their portfolios even *more* toward MBS, leveraging more in an economic sense, yet remaining safer in a Basel risk-weighted sense.

There are several things that could be done differently in the Dodd-Frank Act to avoid such a correlated buildup of mortgage exposures starting in 2003.

First, rather than taking an *a priori* stance that one asset will always remain safer than other assets, the regulators could re-confirm their assumption by applying an annual stress test of the financial sector based on the composition of assets in different banks' portfolios. If all of them were concentrated in mortgages, they would hardly represent a "safer" asset class from the standpoint of stabilizing the system at large. Indeed, the Reserve Bank of India (RBI), recognizing the excess concentration to retail housing risk in Indian banks, raised the risk weights on this asset class in the year before the crisis, and averted a potential hard landing in 2008. There is an important lesson in RBI's macro-prudential move for regulators abroad.

Second, the systemic risk itself could be assessed using simple methods that investigate whether banks' equity returns imply greater systemic risk – for example, if they are more correlated with the overall market or the financial sector as a whole. If applied during the pre-2007 period, our research shows that such measures would have

identified that the most systemically risky institutions were the investment banks (also most highly leveraged) and then Fannie Mae and Freddie Mac. Charging these institutions with a higher capital requirement would be far better than simply raising the level of capital requirement uniformly for all players, as Basel III reforms are proposing.

This “back to the future” exercise has its limitations to be sure. We do not want legislation that will help us to win the last war, or only the next one, but it is equally dangerous to think the next one will be different altogether.

Next, I analyze whether the Dodd-Frank Act have dealt adequately with the failures of Bear Stearns, Lehman Brothers and AIG, along with the attendant stress in money markets.

In terms of dealing with future financial crises, the Dodd-Frank Act gives rights to prudential regulators to break up the systemically important institutions when they get into trouble and requires wind-down plans of these institutions in advance for resolving them in an orderly manner. We argue below, however, that there remains substantial uncertainty that this is going to work well, if at all.

To illustrate this, assume a credit boom took hold in the financial sector from 2003 to the second quarter of 2007, followed by a housing price collapse across the board in the United States. In March 2008, Bear Stearns was beginning to experience trouble as a result of its poor equity base relative to its leverage (of course, it remained well-capitalized from Basel capital standpoint, as we explained in the first article). Bear’s balance sheet had an asset side exposed to the housing market and a liability side that was extremely fragile and exposed to runs. In particular, Bear was rolling over each night in excess of \$75 billion of repo contracts on mortgage-backed securities. These were AAA-rated for the most part but were anticipated to have losses in the future and rightly feared to be illiquid by the repo financiers, mainly money market mutual funds. Bear’s primary money market financiers – Fidelity and Federated – feared having to liquidate the underlying collateral in an illiquid market at substantial fire-sale discounts (since they would not be able to hold long-term assets without violating their maturity restrictions). They refused to roll over the repo. Bear had to draw down on its \$20 billion pool of liquidity, and within a week, was brought to its knees with no assets on its balance sheet that it could pledge in any market without investors fearing the risk of rollover and thus charging substantial haircuts. Bear faced bankruptcy by the middle of March.

The first two weeks of March 2008 can be considered the “run” phase of the Bear Stearns collapse. As Bear faced bankruptcy, authorities had to decide whether to let it fail. Bankruptcy would lead to substantial liquidations of its assets backing the repos that were still outstanding, which would translate to losses to commercial paper providers of Bear -- again, mainly money market mutual funds. In short, the failure of Bear Stearns could have led some money market funds to “break the buck,” as the Reserve Primary Fund eventually did when Lehman Brothers was allowed to fail in mid-September of 2008. This would have precipitated redemptions from money market funds, in general, because many of them were exposed to investment banks with portfolios similar to Bear Stearns. Also complicating the scenario was the fact that Bear Stearns was a primary clearer of a large number of credit default swaps, effectively performing the role of a clearing bank (if not exactly a clearinghouse) as a private entity side-by-side with its

other investment banking activities. The failure of Bear would have thus created severe uncertainty about possible contagion spreading through the network of counterparty exposures -- as would have the failure of AIG in mid-September 2008 had it not been backstopped by the government.

Now, suppose the Dodd-Frank Act had been in place at the time of Bear's collapse. The first thing to note is that the Federal Reserve would not have been able to act as swiftly to provide direct aide to Bear in the form of the guarantees that were required to facilitate its sale to J.P. Morgan. Dodd-Frank limits the Section 13(3) lending authority of the Fed. The Fed would have had to appeal to the Systemic Risk Council to begin the reorganization process. It is hard to know if the Council would have responded with sufficient speed and cohesion to meet the needs of the situation, but the constraints on the Fed could have arguably made the panic worse. Note also that even a forceful version of the Volcker Rule would have made no difference for the structure or risks on Bear-Stearns balance sheet because it does not restrict the proprietary trading activities of non-banks.

One thing the Dodd-Frank does is increase transparency in markets in a number of ways, and that would have helped in the Bear Stearns case. One of the biggest problems confronting regulators at the time was uncertainty about counterparty exposures and their likely consequences. With the Dodd-Frank provisions in place, the credit default swaps that Bear was clearing would most likely have been cleared instead through a central clearinghouse. For their part, the clearinghouse and the regulators would have had access to full information on various counterparties, and therefore would have been able to assess whether there was, in fact, substantial settlement risk arising from re-intermediation of swaps cleared by Bear Stearns. And, even if some of the swaps were not centrally cleared, the transparency requirements of the Dodd-Frank Act would have meant that information about counterparties to these swaps would have been in a centralized data repository such as the Depository Trust and Clearing Corporation (DTCC). Armed with this knowledge, regulators could have dealt with containing the damage and pacifying markets if there were no significant exposures, after taking account of the (greater) collateral or margin that would have been required under the Dodd-Frank Act.

The only uncertainty would arise if there were substantial uncollateralized exposures to another counterparty, say Goldman Sachs, which would now face a significant write-down. Without a clear plan to deal with this exposure, the regulators would struggle to release information to the market that Goldman Sachs was in trouble as a result of Bear's failure. But a lack of revelation of such information by regulators would itself be adverse information to markets! What would be required under such circumstances is a temporary mechanism to deal with the uncollateralized exposure -- for example, making Goldman Sachs a conservative payment against its exposure -- through the Fed's emergency lending (13(3) assistance) but with a clawback based on eventual re-intermediation or liquidation costs incurred on these exposures.

The resolution process would have been triggered by Bear's difficulty, and the orderly liquidation of positions could take place in principle. But, the important question remains: Would the regulators implementing the Act -- the Treasury, the Fed, the FDIC --

have been able to stick to its premise of passing along all losses on its counterparty exposures at a time when the whole system was subject to similar exposures? As we have said before, while the Act has its heart in the right place in wanting to eliminate too-big-to-fail, there is a fair bit of uncertainty left in terms of exact resolution and wind-down procedures. While markets would certainly not digest such uncertainty well, history has shown over and over again that regulators do not either, and there would have been a call for emergency powers overriding the provisions of the Dodd-Frank Act.

The Bear Stearns example also highlights another generic problem with the Dodd-Frank Act: that it does not come to grips with the question of what is a “bank” and what is “banking,” and therefore it does not address many of the issues of the shadow banking system. The Act contains nothing that would deal with the commercial paper and repo market runs that triggered Bear’s collapse. In cases when the liquidated values on repo contracts and anticipated recoveries on commercial paper holdings turn out to be substantially discounted, some of the money market funds providing the financing might get pushed to breaking-the-buck. Without a clear plan to resolve money market fund failures, the depositors of money market funds would now rush in to claim their deposits before others could, imposing further redemption issues for these funds. Some of the depositors might have deposits in other funds too, and realizing losses on one set of savings, they might need to liquidate some others, inducing a contagious run on these other funds.

Once again, one would need the Fed to step in to temporarily provide liquidity to stop the redemptions – provisions that could be at conservative valuations of money market fund assets. And the unwinding of insolvent funds would have to be orderly in due course with additional losses clawed back from investors redeemed by the Fed. The same questions arise, however. Given that this is the Fed’s 13(3) emergency lending to a non-bank holding company, would the Financial Stability Oversight Council approve it quickly enough or would uncertainty about the outcome of the process lead investors to rush even faster to pull out their deposits, thus exacerbating the run?

Hence, in all likelihood, even with the Dodd-Frank Act in place, we would have seen something like what happened in the demise of Lehman Brothers if Bear had been allowed to collapse. While some may argue this may have been a good thing – letting Bear fail in March of 2008 rather than Lehman in September of 2008 – the bigger point is that failures of both required orderly resolution, which, in turn, required temporary liquidity assistance to stem the run or the authority to suspend redemptions for a period, by which orderly unwinding of assets of failed institutions could be planned.

At the heart of the problem is the bankruptcy exemption given to repo and derivatives contracts, and the Dodd-Frank Act explicitly keeps that in place. It is clear that this exemption is needed, because without it, a large number of contracts could get stuck in the bankruptcy of a failing firm. The exemption, however, requires a systemic exception. When there were bank runs in the pre-FDIC era, commercial bank clearinghouses in New York would suspend redemption of individual bank deposits and convert those into joint liability certificates of the clearinghouse. Then, we put deposit insurance in place to deal with depositor runs more directly. In the crisis of 2007-2009, when we faced wholesale depositor runs, the Federal Reserve had to pull out all stops – given the lack of FDIC coverage of such deposits – to effectively suspend the runs. And,

in between these episodes, almost all massive bank failures have required such suspension. The systemic bankruptcy exception – that all claims immediately payable be stayed for a day or a few days – could work in the context of Dodd-Frank, if the orderly resolution process acts swiftly enough. For instance, if the regulator has 24 hours to transfer the derivatives of a counterparty to a third party, and at that point the counterparty does not get to (or need to) terminate the contracts, then the liquidity problems would be much more muted.

The good news is that the Dodd-Frank Act does leave substantial latitude to the prudential regulators – the FDIC and the Federal Reserve system – to design orderly resolution procedures. Our back-to-the-future tests make it clear that for the Act to succeed in putting an end to taxpayer-funded bailouts, prudential regulators need to design (i) resolution and wind-down plans not just for systemically important institutions and (ii) robust mechanisms to deal with runs on the system at large from short-term creditors -- runs that can arise not just in retail deposits (which have been addressed since 1934), but also with wholesale finance (such as repos, commercial paper and derivatives) that were at the heart of the recent financial crisis. What is clear, however, is that we have not yet made plans to address this aspect of the issue.

V. Current implementation status of Dodd-Frank and Basel III reforms

The long-term implementation of these reforms started in the Fall of 2010. The Dodd-Frank Act sets a variety of deadlines for rule making on the prudential regulators, mostly at one-year time-point from when the Act was enacted (July 2010). For instance, designation of financial institutions as systemically important ones, which derivatives will be cleared centrally and on what platforms, FDIC's orderly liquidation authority for systemically important institutions, and separation of proprietary trading from bank-holding companies, are all due in terms of initial proposals some time in second half of 2011. However, many of these rules will then be up against a public opinion and appeals period, and the implementation will follow in the few years after the rules are finalized. In a nutshell, considerable uncertainty still remains but much clarity should emerge by the Fall of 2011.⁶

The Basel III rules are largely laid out (see appendix), with further clarity to be provided for capital conservation buffer, especially its counter-cyclical implementation, as well as on whether contingent capital, a form of debt capital that converts to equity based on pre-designed triggers, would be a part of Basel III requirement. Given the lengthy implementation phase (from now till 2013 for first installment, and then till

⁶ Some useful links to follow concerning on-going implementation of the Dodd-Frank Act are: (i) the Dodd-Frank section of the Securities Law Practice Center at <http://seclawcenter.pli.edu/category/dodd-frank-act/>, (ii) http://www.reedsmith.com/db/documents/Dodd-Frank_Rulemaking_Calendar_-_Proposed_Rules.pdf, (iii) http://www.americansecuritization.com/uploadedFiles/ASF Dodd-Frank_Rulemaking_Schedule.pdf, (iv) <http://www.sec.gov/spotlight/dodd-frank/dfactivity-upcoming.shtml>, and (v) <http://dodd-frank.com/sec-falls-short-on-rulemaking-agenda/>.

2019), it is quite likely that rules may undergo at least some changes, even on the core capital and liquidity requirements.

While the Dodd-Frank Act, with all its limitations, represents a comprehensive overhaul of the financial sector reforms in the United States, such clarity is missing elsewhere in the Western economies. The United Kingdom has set up an Independent Banking Commission, under the guidance of Sir John Vickers of Oxford University, to come up with proposals for reforming the financial sector of the UK. The UK is one country, where given the support of Bank of England Governor Mervyn King, the idea of “structural reforms”, along the lines of Glass-Steagall separation of trading activities from commercial banks, is still under debate. The UK is also among the few countries where the idea of relatively high bank capital ratios, in excess of 15%, against un-weighted assets, is still being debated. There is much lesser clarity on derivatives reforms in the UK, though before its inclusion into the Bank of England, the Financial Services Authority (FSA), did present a view, somewhat surprisingly not pushing for centralized clearing and counterparties for derivatives markets. It is an open debate as to whether some of this reluctance is due to international race for attracting greater order flow in markets such as credit derivatives where London thrived. Finally, the UK – even prior to the crisis – had stricter liquidity requirements (holdings of Sterling at banks based on one-week projected cash flow needs) than in other parts of the world. These have been strengthened but Basel III is likely to super-cede these over time.

Finally, there is even less clarity as far as reforms in the Europe are concerned. On the one hand, Europe is likely to adhere to the Basel III reforms. On the other hand, there are a number of institutional changes taking place in the Eurozone. For instance, a European Systemic Risk Board has been set up with an academic advisory council to guide the efforts on identification of systemically risky institutions and design of macro-prudential regulation more broadly. Similarly, a college of supervisors has been put in place to provide a pan-Eurozone body that can share information about banks across regions and geographies. The current focus, however, is on resolving the sovereign credit risk issues in the Eurozone, for which too a pan-European stabilization fund has been set up. I will focus below on how the sovereign risk issues in the Eurozone are inter-twined with bank solvency issues, and that until these are resolved, European financial sector reforms are likely to be up in the air. After all, a significant crisis triggered by restructuring of the debt of a Eurozone country is not just possible, but highly probable, at the current point of time.

VI. Transition Risks

As explained above, the transition periods for Dodd-Frank and Basel III are relatively long. What are the implications of capital adoption by Western banks for emerging markets such as India? What transition risks are posed not just for Western economies, but also for the global economy at large?

First, there is a distinction on this issue between the United States and the Europe. The United States regulators conducted a stress test of the largest 19 bank holding companies in 2009. The design of this stress test was to subject bank balance sheets to a common (moderate and severe) macroeconomic shock, assess capital shortfalls of banks relative to threshold capitalization, and require that banks replenish their capital in advance not to become under-capitalized in this stress scenario. A total of \$75 billion of equity capital was issued following the results of the stress test in April/May 2009, with Bank of America and Wells Fargo together issuing over \$40 billion. The results of the stress test were fairly transparent as well. They had a calming effect on markets in terms of lowering the credit-default swap spreads of the US banks and their volatility of stock returns, across board for all of the bank holding companies. In many ways, this was the most important recapitalization – perhaps even more important than TARP – in eliminating market uncertainty about which banks were healthier and which were less so, but then ensuring they were all reasonably healthy to deal with a systemic stress event.

Such decisive and transparent recapitalization of banks is yet to take place in the Eurozone, even though it is perhaps even more necessary there. One, European banks' adherence to mark-to-market was much weaker than that of the US counterparts. Second, European banks started with far smaller levels of Tier 1 capital, since they had employed a garden variety of hybrid claims to meet Basel 1/2 requirements. European regulators conducted stress tests in Spring of 2010, releasing the results for 91 banks in June 2010. The markets were largely disappointed by the tests. Not by the fact that all but seven banks cleared the tests, but because the tests were so poorly designed that one could not read much into that success rate. Even though Greek debt restructuring was a foregone conclusion in minds of most players in the financial marketplace, the stress tests involved much rosier scenarios. French and German banks are known with almost certainty to be owning sovereign bonds of several countries that are experiencing refinancing problems, but the stress test effectively ignored the risks of such holdings by valuing them at above market-implied rates.

The total sovereign bond holdings of these banks were disclosed as a snapshot as of 31st March 2010 (see Table 5 which shows that the Eurozone sovereign bond holdings of the 91 stress-tested banks are about 1/6th of the size of their risk-weighted assets). That information turned out to be useful to markets. Expectations about some large European banks were revised downward by markets in light of opacity of the stress tests but the patently obvious exposure of Eurozone banks to weaker countries (Greece, Ireland, Spain, Portugal and Italy, the GIPSI). In the end, the fact that only one Greek bank, five Spanish banks (*Cajas*) and one German bank failed the stress tests was hardly reassuring. These were in fact not the systemically important financial institutions of Europe whose insolvency would threaten the global financial markets were Greece or Ireland to default.

In many ways, the lack of Eurozone resolve to recapitalize their banks has created a significant transition risk for rest of the world. The first of these transition risks is that these banks are most likely substantially under-capitalized for a stress scenario of significant sovereign debt restructuring (say, of the size of Spain), and yet are at the same time asked to recapitalize by Basel III. Since the required recapitalization is not

immediate – immediacy is the need of the hour for these banks – but protracted (by 2013 and then 2019), the situation is somewhat akin to the “zombie” bank problem of Japan following the real estate bust in 90’s. The markets are not sure which banks are zombies; hence, no banks are likely to readily tap capital markets for equity issuances until regulators force them to. But the regulators are lacking in such willingness, either due to political capture or the misplaced – and rather extreme – aversion to ANY signaling of bank insolvencies under the pretext of there being “multiple equilibria”. Hence, banks are not de-leveraging or shrinking their assets, but steadily rebuilding their capital base through retained earnings. In an era of Western economy growth such as the current one, such retention of earnings means reduced capital for higher growth centers such as Asian economies which should ideally right now see an inflow of banking capital due to their much higher growth projections relative to the Western economies.

In essence, the current under-capitalization of Eurozone banks against sovereign risk exposures, and only a protracted recapitalization requirement, is likely subjecting the rest of the economies globally to a “credit crunch”, or certainly, a substantially higher cost of borrowing than is warranted. What is worse, should a sovereign crisis hit the Eurozone, this cost can grow up even further, both for Asian economies/governments and their corporations. Conversely, the role of US dollar as a reserve currency has likely strengthened over this period, during an era in which normal Eurozone circumstances might have suggested a weakening of the dollar’s reserve status.

Table 5: Source – Acharya, Drechsler and Schnabl (2010), based on European stress test data released in June 2010

Sovereign Holdings						
Euro Bank Stress Tests Sample, March 31, 2010						
	N	Mean	Std.Dev	50th Percentile	5th Percentile	95th Percentile
	(1)	(2)	(3)	(4)	(5)	(6)
Bank Characteristics						
Risk-weighted Assets (EUR million)	91	126,337	179,130	63,448	3,269	493,307
Tier 1 Capital Ratio (%)	91	10.2	2.4	9.8	7.2	14.4
Sovereign Exposure						
Sovereign Holdings (gross, EUR million)	91	20,668	27,948	7,930	105	81,765
Sovereign Holdings (net, EUR million)	91	19,719	27,329	6,960	105	78,959
Home Sovereign Holdings (gross, EUR million)	91	11,493	14,422	5,774	182	42,800
Home Sovereign Holdings (net, EUR million)	91	11,023	13,956	5,348	117	42,800
Home Share (%)	91	69.4	30.0	81.6	18.9	100
Greek Sovereign Holdings	91	669	2,844	0	0	5,601
Share Banking Book (%)	91	84.9	19.9	92.2	35.4	100.0

Second, a significant transition risk also emerges from the fact that as Western financial sector experiences increasingly stringent capital requirements on a protracted basis, rather than a one-time recapitalization basis, the riskier activities may find their ways into the “shadow banking” world of hedge funds and asset managers. This is a mixed blessing. On the one hand, the capital structure of some of these institutions is less fragile than that of banks. If these institutions seek out the higher growth of Asian economies, the capital structure backing their capital flows is more likely to be robust to economic cycles. On the other hand, the lack of full capital mobility into many of the Asian economies implies that these institutions are raising capital primarily abroad, subject to their home-country regulations (if any), and ultimately concerned about profits in their own currencies. A systemic shock to Eurozone such as Spanish debt restructuring – and for the United States such as an Italian debt restructuring – could lead to significant reduction of risk appetite and capital outflows as these institutions seek to meet redemptions from their domestic investors (who themselves would have lowered their risk appetite and started demanding liquidity for precautionary reasons).

While the jury is still out, casual empiricism suggests that such high-velocity capital inflows and outflows do create gyrations in emerging stock market returns. The lack of adequate analysis of the price impacts that arise in these markets leads to naïve interpretations, such as attribution of all post-2008 recovery in the Indian stock market to purely an improvement in the fundamentals (naïve, since the preceding crash of 2008 was partly flow-driven too). Such attribution, in turn, can mask the future capital outflow risks and boost consumption and corporate investment up to points that do not adequately reflect these risks.

One remedy proposed to deal with the substantial capital inflows and outflows is to throw some sand in their wheels, along the lines of a Tobin tax, e.g., imposing a round-trip cost for very short-term transactions. This can, however, also stagnate the capital inflows into an economy in the first place and make a shallow stock market even further illiquid. Another remedy, which I prefer, is to instead ensure that the hedge funds and asset managers be granted liberal capital inflow and outflow regime, but their effective leverage or redemption risks be managed by requiring that they have “gates”, e.g., not more than 10% redemptions of capital in a given month. The second remedy is preferred because the first remedy – restricting (volatility of) capital flows – addresses the symptom, whereas the second remedy – addressing redemption risk and leverage of asset managers – address the cause of volatile capital flows and is likely to be more robust and effective. It is worthwhile considering a balance between the two remedies to design resilient regulation, if gate-style regulation is hard to enforce on foreign-domiciled firms.

Third, as described earlier in this piece, Basel III reforms are pushing banks to hold substantially greater liquidity than in the past. In many cases, this will encourage banks to hold more liquid assets (alternative being to manage more stable liabilities), comprising government bonds and central bank reserves which can be generally obtained by swapping government bonds as collateral.

There are several important implications of these, especially in the Eurozone. One, while Eurozone sovereign bonds may be liquid, especially swappable with the

European Central Bank which has been forced to undertake a quasi-fiscal role absent clear fiscal authority in the Eurozone, these bonds are currently highly credit-risky, in particular, for the GIPSI countries. How will Eurozone banks increase their holdings of liquid assets in a time when the candidate assets are substantially credit-risky? Second, if risk-weights on Eurozone sovereign bonds are not adjusted to adequately reflect their credit risk, then liquidity rules of Basel III will in fact lead to even more poorly capitalized banking system in the Eurozone. Further, the lack of pricing of Eurozone sovereign credit risk in bank capital requirements, concomitantly with a push to holding this risk under liquidity ratios, would create a government bond “bubble” that would delay the timely revelation of sovereign credit risks. Indeed, it is arguable that ECB’s quasi-fiscal role may have already contributed to such delayed recognition during 2008-09. Further, such a bubble would again artificially raise the cost of borrowing for other governments, especially of the Asian economies, while likely helping to continually strengthen the reserve status of US dollars.

Sudden eruption of sovereign credit risk – and through sovereign bond holdings of banks – could constitute a significant systemic risk for the global economy in future. As Figure 3 shows, banks of many countries already hold most of their sovereign bond holdings in the form of their own country bonds. For instance, the ratio is over 60% for GIPSI countries. A default or credit restructuring by one of these countries could trigger a full-scale bank run on their banking system as they take “collateral damage” too from the restructuring. Basel III’s liquidity ratios may inadvertently accentuate this problem.

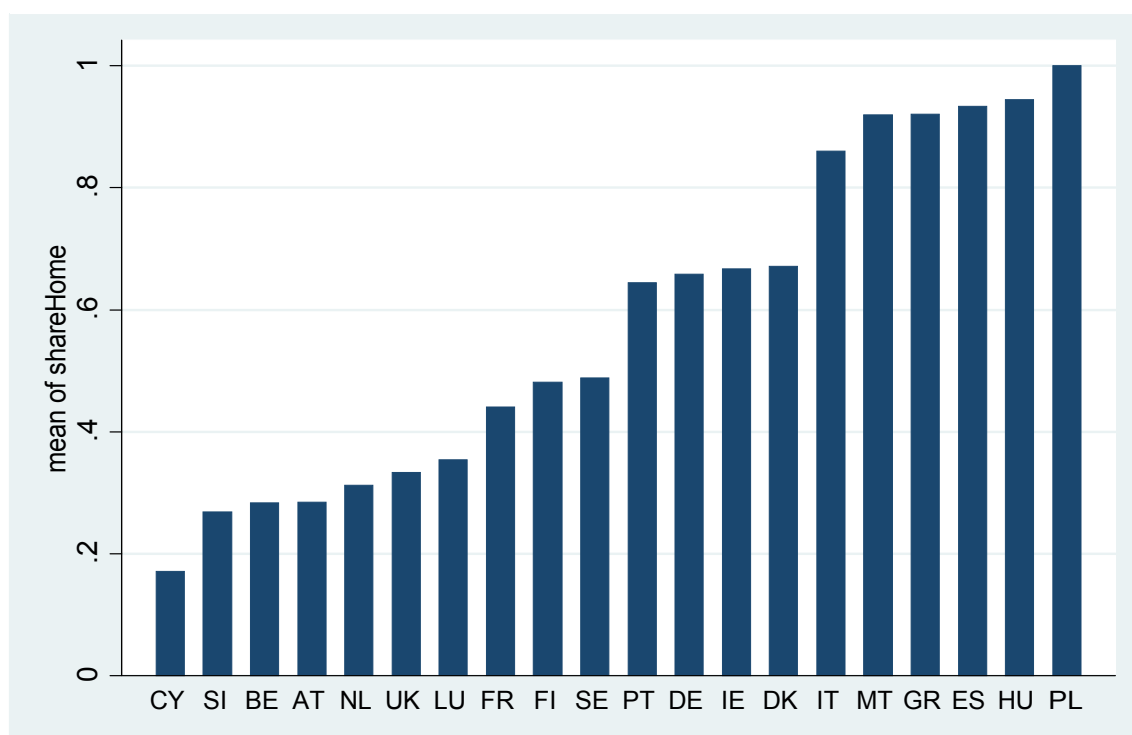


Figure 3: Source – Acharya, Drechsler and Schnabl (2010), based on European stress test data released in June 2010, showing the share of sovereign bonds of banks in a nation that is in the form of home-government’s bonds

Fourth, government interventions in Western economies and financial sectors pose a significant risk to their own economies as well as to the global economy at large. Just two and a half years ago, there was essentially no sign of sovereign credit risk in the developed economies and a prevailing view was that this was unlikely to be a concern for them in the near future. Since the Fall of 2008, however, sovereign credit risk became a significant problem for a number of developed countries. Financial sector bailouts, first announced in end of September 2008, and increasingly being provided through back-door arrangements such as the European stabilization mechanism, have contributed significantly to the sovereign credit risk.

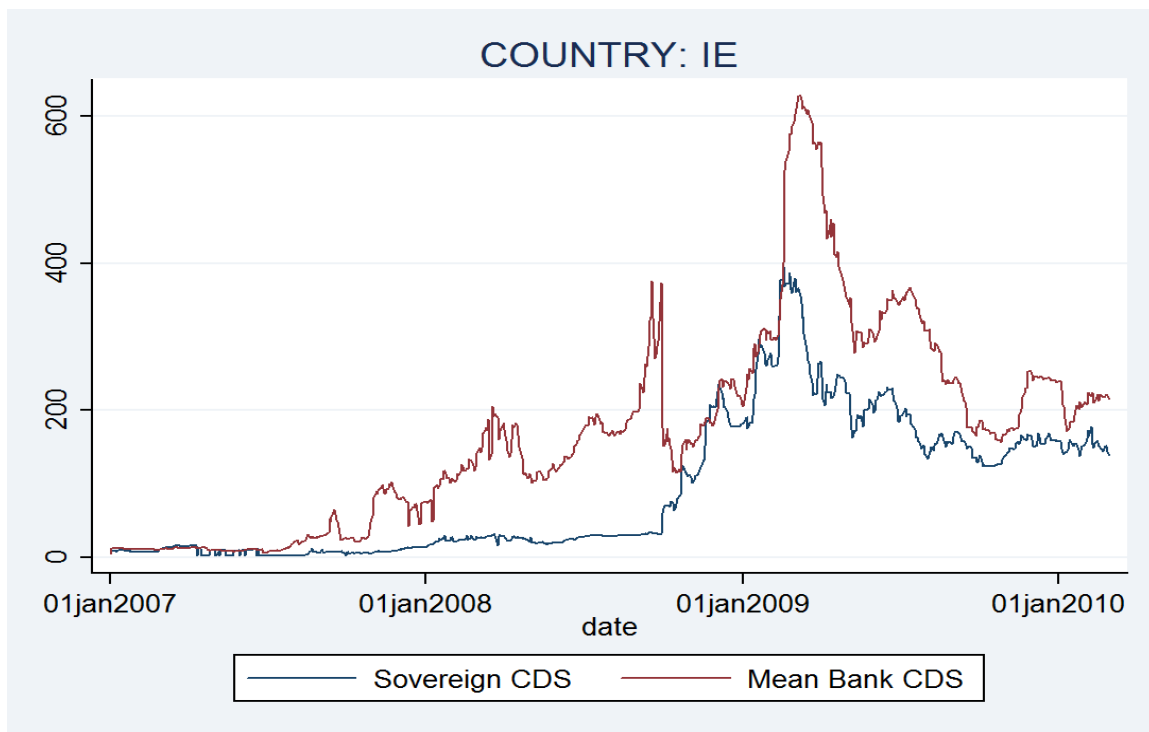


Figure 4: Source – Acharya, Drechsler and Schnabl (2010), based on five-year credit default swap spreads on Irish banks and Irish government

Consider the case of Irish bailout. On September 30, 2008 the government of Ireland announced that it had guaranteed all deposits of the six of its biggest banks. The immediate reaction that grabbed newspaper headlines the next day was whether such a policy of a full savings guarantee was anti-competitive in the Euro area. However, there was something deeper manifesting itself in the credit default swap (CDS) markets for purchasing protection against the sovereign credit risk of Ireland and that of its banks. Figure 4 shows that while the cost of purchasing such protection on Irish banks -- their CDS fee – fell overnight from around 400 basis points to 150 basis points, the CDS fee for the Government of Ireland's credit risk rose sharply. Over the next month, this rate more than quadrupled to over 100 basis points and within six months reached 400 basis points, the starting level of its financial firms' CDS. While there was a general

deterioration of global economic health over this period, the event-study response in Figure 4 suggests that the risk of the financial sector had been substantially transferred to the government balance sheet, a cost that Irish taxpayers must eventually bear.

Viewed in the Fall of 2010, this cost rose to dizzying heights prompting economists to wonder if the precise manner in which bank bailouts were awarded have rendered the financial sector rescue exorbitantly expensive. Just one of the Irish banks, Anglo Irish, has cost the government up to Euro 25 bln (USD 32 bln), amounting to 11.26% of Ireland's Gross Domestic Product (GDP). Ireland's finance minister Brian Lenihan justified the propping up of the bank "to ensure that the resolution of debts does not damage Ireland's international credit-worthiness and end up costing us even more than we must now pay." Nevertheless, rating agencies and credit markets revised Ireland's ability to pay future debts significantly downward. The original bailout cost estimate of Euro 90 bln was re-estimated to be 50% higher and the Irish 10-year bond spread over German bund widened significantly, ultimately leading to a bailout of Irish government by the stronger Eurozone countries

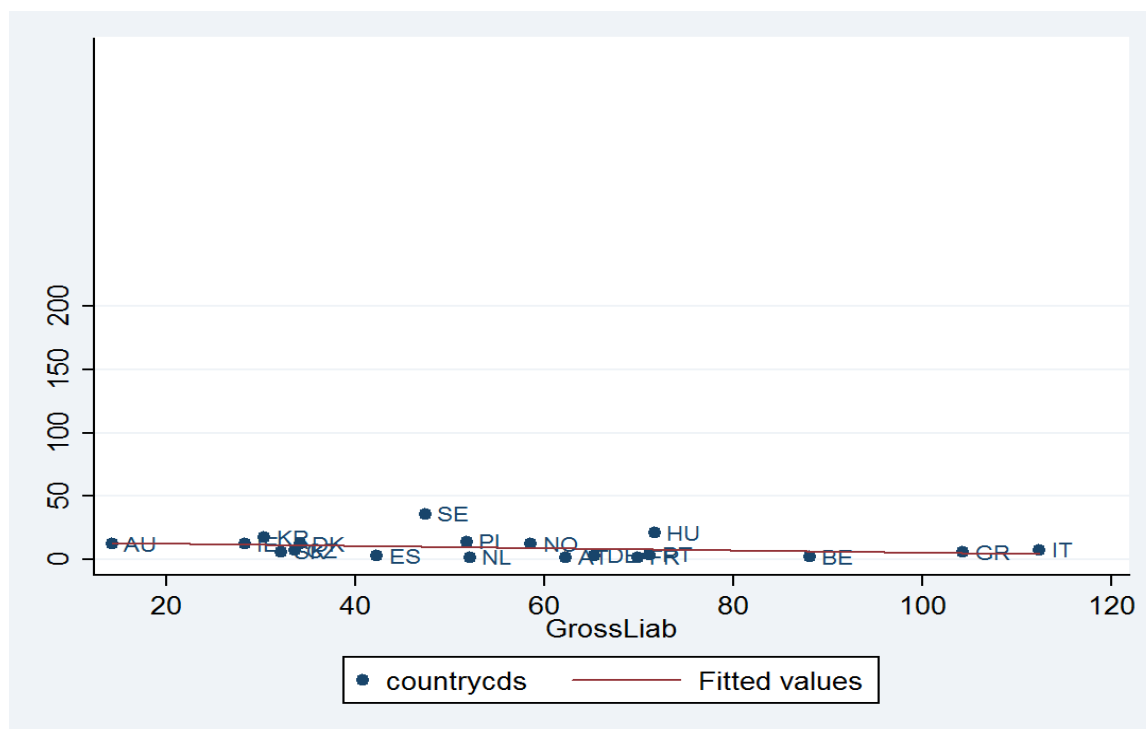


Figure 5: Source – Acharya, Drechsler and Schnabl (2010), based on five-year credit default swap spreads on Eurozone governments and their gross liabilities to GDP ratios, in March 2007

This episode is not isolated to Ireland though it is perhaps the most striking case. In fact, a number of Western economies that bailed out their banking sectors in the Fall of 2008 have experienced, in varying magnitudes, similar risk transfer between their

financial sector and government balance-sheets. As Figure 5 shows clearly, in March of 2007, there was little, if any, relationship between sovereign CDS of Eurozone countries and the sovereign balance-sheet condition, measures as sovereign's gross liabilities relative to the GDP. The sovereign CDS levels were themselves small in an absolute sense, generally ranging under 50bps as was the norm with developed economies.

However, by March of 2010, this relationship became markedly positive, with the levels of sovereign CDS in many cases touching 350bps, seen hitherto only for sovereign CDS of emerging markets. Many countries experienced significant shifts in their sovereign debt to GDP ratios, for instance, Ireland's ratio rising from 30% in March 2007 to close to 70% in March 2010. In essence, sovereign's asset-sides became significantly weaker while their liabilities rose due to financial sector bailouts. In my view, these issues are connected.

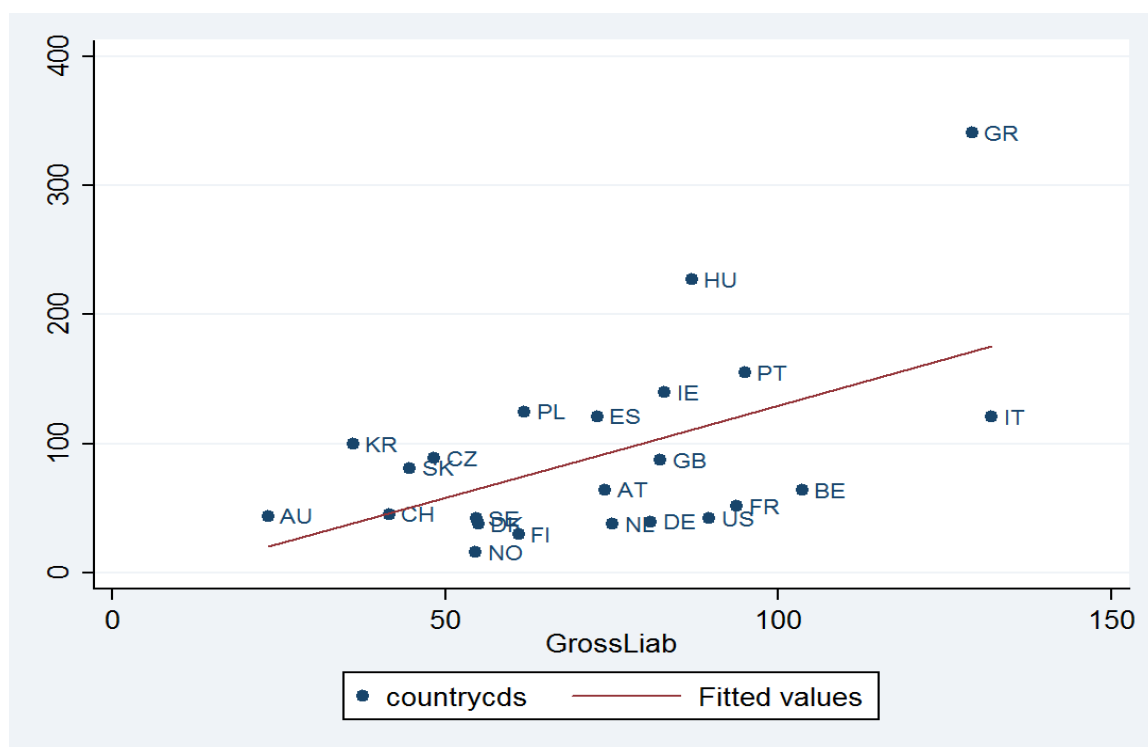


Figure 6: Source – Acharya, Drechsler and Schnabl (2010), based on five-year credit default swap spreads on Eurozone governments and their gross liabilities to GDP ratios, in March 2010

When an entity is financially distressed, its left-hand side of balance-sheet cannot be fixed without fixing the right-hand side of balance-sheet first! As Ireland was asked to raise taxes to meet its future debt obligations, Hewlett Packard threatened to move its printing elsewhere. This then is the biggest risk to Eurozone growth: the strange reluctance of the regulators and governments to recapitalize the financial sector; blanket

guarantee provision in the wake of Lehman Brothers to financial sector liabilities; the guarantees engulfing entire sovereign balance-sheets in some cases when they were already plagued by slow growth; the “bailout squared” from stronger Eurozone countries, which in absence of financial restructuring of their own banks exposed to weaker Eurozone countries, threatens to create the scenario of a “lost decade” for Europe as a whole. This is partly a transition risk, but partly it is the hangover of the financial crisis of 2008, and it is likely to sustain substantial uncertainty in global economic outlook for several years to come. Emerging markets, such as India, should not only be prepared for this uncertainty, but also remain sufficiently well capitalized as sovereigns to deal with the likely Armageddon on sovereign debt markets when Eurozone sovereign debt restructuring – the inevitable – becomes reality.

VII. Lessons for India from the Crisis, Dodd-Frank and Transition risks

A. Government Guarantees

Explicit and implicit government guarantees such as deposit insurance and too-big-to-fail can generate significant moral hazard in the form of risk-taking incentives. Even absent other market failures, this moral hazard can lead to excessive systemic risk and financial fragility. Consider our analysis of the lessons learned from the current crisis for the United States. Deposit insurance enacted in the 1930s in the wake of the Great Depression had long-term success only because significant protections were put in place in terms of insurance charges, regulation (mostly in the form of capital requirements and wind down provisions), and restrictions on bank activity. As these protections began to erode in the recent period in the U.S., the moral hazard problem resurfaced.

To some degree, this lesson was already known in emerging markets. The number of countries offering explicit deposit insurance increased multifold from 12 to 71 in the 30-year period starting in the 1970s. Research looking at a large cross-section of countries in the post 1980 period has concluded that deposit insurance increases the likelihood of a banking crisis. Moreover, the likelihood and severity of the crisis are greater for countries with weaker institutional and regulatory environments and the greater the coverage offered depositors. The incentive problems associated with the moral hazard from deposit insurance can be partially offset by effective prudential regulation and loss-control features of deposit insurance. However, in many Asian economies, including India, the charging for deposit insurance is poor.

In fact, to the extent that significant parts of financial sectors are state-owned, the guarantees from the government exceed just deposit insurance. The state ownership also brings with it the bailout “genie”. As Irish example during 2008-2011 has illustrated, unlimited depositor guarantees and regulatory forbearance increase the fiscal costs of financial crises. Moreover, these actions increase the expectation that this will be the government’s solution for future crises, thus, killing market discipline and increasing the chances of risk-shifting amongst financial institutions.

Of course, many analysts might point to the apparent “success” of the guarantees employed in the U.S. in the current financial crisis, and even more so to the stellar success stories of India and China and the government backing they received. Let us analyze these latter cases as examples in emerging markets.

Consider India first. A significant part of the Indian banking system is still state-owned. While they are generally considered less efficient and sophisticated than the private sector banks, public sector banks in India in fact grew in importance during the financial crisis (which for India could be considered as the year 2008). The reason is simple and somewhat perverse: There was a “flight to safety” away from private sector banks, which have limited deposit insurance, to public sector banks, which are 100% government guaranteed (effectively so, as with the GSEs in the United States). This is because the relevant law (“Bank Nationalization Act”) explicitly places 100% liability for public sector banks on the government.

Hence, when the financial crisis hit India -- especially in autumn of 2008, by which time the Indian stock market had plummeted by more than 50% and corporate withdrawals from money market funds threatened a chain of liquidations from the financial sector -- there was a flight of deposits to state-owned banks.⁷ In the period January 1, 2008, through February 24, 2009, the public sector banks’ market capitalization fell by 20% less than that of the private sector banks. Interestingly, this occurred even though based on a pre-crisis measure of systemic risk – the Marginal Expected Shortfall measure⁸ -- public sector banks were substantially more likely to lose market capitalization during a market-wide downturn than private sector banks. In addition, within the private sector banks, those with higher systemic risk suffered more during the economy-wide crisis of 2008 (as the systemic risk measure would predict), whereas within public sector banks, those with higher systemic risk in fact performed better! This divergence in behavior of public and private sector banks is telling and strongly suggests a role of government guarantees in boosting weak public sector banks at the expense of similar-risk private sector banks.

The trend of benefits to the state-owned banking sector at the expense of the private-owned banking sector continues. Recent reports suggest that loan growth of private sector banks in India has not been that high in 2009, whereas loans at public sector banks have grown in many segments, such as vehicle-backed finance, by as much as 10%. In essence, government guarantees have created a lack of level-playing field, which is destabilizing for two reasons. First, it has weakened those institutions that are in fact subject to market discipline. Second, it has raised prospects that the “handicapped” private sector banks (due to lack of comparable government guarantees) may have to lend

⁷ In a notable incident, Infosys, the bellwether of Indian technology and a NASDAQ listed company, moves its cash in hand from ICICI Bank, one of the largest private-sector banks, to State Bank of India, the largest public-sector bank.

⁸ Acharya, Pedersen, Richardson and Philippon (2009) and Acharya and Kulkarni (2010). In particular, MES was calculated as follows. The worst 5% days for the S&P CNX nifty index (or Bombay Stock Exchange sensex index) were taken over the year 2007. On these days, the average return of a financial firm was measured. This average return is the MES for that financial. The results are available from authors upon request.

– or take other risks -- more aggressively in order to maintain market share and generate comparable returns to shareholders. Bank regulation in India tends to be on the conservative side, often reining in risk-taking with overly stringent restrictions. However, the debilitating effects of government guarantees can travel quickly to the corporate sector and other financial firms reliant on banks, which are not directly under bank regulator’s scrutiny or legal mandate.

In China’s case, as a part of its fiscal stimulus, the Chinese Government essentially employed its almost entirely state-owned banking sector to lend at large to the economy. From July 2008 to July 2009, lending by the Chinese banking sector grew by 34%. While this has clearly helped the Chinese economy recover quickly from the effect of the financial crisis in the United States – and its consequent effects on global trade -- much of the growth in banking sector loans mirrors the growth in corporate deposits. In other words, loans are often sitting idle on corporate balance sheets, a phenomenon that is generally associated with severe agency problems in the form of excessive investments. While some of the “excess” may be desirable as part of the stimulus, especially if it is in public goods such as infrastructure projects, estimates suggest that the excess liquidity is also finding its way into stock market and real estate speculation. It is not inconceivable that such lending through state-owned banks would be reckless and sow the seeds of asset-pricing booms and, perhaps, the next financial crisis. The moral hazard is clear: China has bailed out its entire banking system more than once before, and in far greater magnitudes than the United States has in this crisis.

The examples of India and China highlight the classic risks that arise from government guarantees. First, that they create an uneven playing field in banking sectors where some banks enjoy greater subsidies than others. This invariably leads the less subsidized players to take excessive leverage and risks to compensate for a weak subsidy, and the more subsidized players to simply make worse lending decisions given the guarantees. Second, government-guaranteed institutions are often employed to disburse credit at large to the economy, but this invariably ends up creating distortions, as the costs of the guarantees are rarely commensurate with risks taken. The situation in India partly mirrors that in the United States, where commercial banks enjoyed greater deposit insurance but investment banks did not; over time, investment banks expanded their leverage significantly, leading to their demise. Commercial banks suffered, too, but fared somewhat better because of their insured deposits. The situation in China is comparable to the massive credit expansion and risky betting that occurred on the balance sheets of the Fannie Mae and Freddie Mac in the United States.

Both of these problems festered because of government guarantees and contributed to the financial crisis of 2007-2009. India and China should not rest on their laurels of rapid recovery from this global economic crisis. Instead, they need to safeguard their financial and economic stability by engaging in a rapid privatization of their banking sectors -- or at the least, stop inefficient subsidization of risk-taking through state-owned banks. The genie of government guarantees brought out to deal with the crisis of 2008 needs to now be put back into the bottle, as these guarantees do not just weaken the banks that are guaranteed, but they also create systemic risk by weakening

competing banks, subsidizing corporations and fueling excessive asset speculation. And this is all true even leaving aside the natural risks stemming from politically-motivated priority lending targets subjected to state-owned banks, their inevitable under-performance, and eventual bailouts.

B. Systemic Risk of Emerging Markets and its Coordinated Regulation

There are various ways a financial institution produces systemic risk when the institution fails: counterparty risk, fire sales, and “runs”. One of the principal conclusions from that analysis was that systemic risk is a negative externality on the system and therefore cannot be corrected through market forces. In other words, there is a role for regulation in order to force the financial institution to internalize the external costs of systemic risk. The exact same analogy for financial institutions within a domestic market can be made with respect to international markets, and especially so for emerging markets.

Even if a domestic regulator penalized a multinational financial firm for producing systemic risk locally, does this penalty carry through to all the international markets a firm operates in? In other words, should the penalty be more severe as failure can lead to systemic consequences elsewhere? The issue becomes even more complicated because financial institutions have an incentive to conduct regulatory arbitrage across national jurisdictions: i.e. if institutions are more strictly regulated in one jurisdiction they may move (their base for) financial intermediation services to jurisdictions that are more lightly regulated. But given their inter-connected nature, such institutions nevertheless expose all jurisdictions to their risk-taking. Individually, jurisdictions may prefer to be regulation-“lite” in order to attract more institutions and thereby jobs.

The poster child of the preceding crisis for being internationally interconnected is Iceland. Iceland, a tiny country with its own currency, allowed its banking sector to grow almost tenfold in terms of foreign assets compared to that of its own GDP. Its huge leverage aside, its survival was completely dependent on conditions abroad. The systemic risk of the three largest Icelandic banks (Kaupthing, Landsbanki and Glitnir) also went beyond its own borders. Because the banks had fully exploited internal expansion within Iceland, they opened up branches abroad, in particular, the U.K. and Netherlands, by offering higher interest rates than comparable banks in the U.K. and Netherlands. When the Icelandic banks began to run aground and faced massive liquidity problems, in a now somewhat infamous event, the U.K. authorities invoked an anti-terrorism act to freeze the U.K. assets. Essentially, Iceland as a country went into shutdown.

Since at least several centuries, the most common source of systemic risk is that of a run. It is well-known that, for many emerging markets, capital inflows are their lifeblood. There are numerous examples of capital flowing into new, emerging markets only to be withdrawn of all a sudden upon a crisis occurring. These “runs” can leave the corporate and banking sector of the developing country devastated, especially if there are currency, liquidity or maturity mismatches between the assets and foreign liabilities. An example from the recent crisis is that net private capital flows to emerging Europe fell

from \$250 billion or so in 2008 to an estimated \$30 billion in 2009. Not surprisingly, emerging Europe has been one of the hardest hit in terms of the impact of the crisis on its GDP and internal institutions.

The current crisis was severe for both its financial effect (e.g., spike in risk aversion of investors) and economic impact (e.g., large drop in global trade since World War II). Compared to past banking crises, therefore, it is quite surprising that by and all emerging markets got through unscathed. This can be partly attributed to better (or excess!) internal planning – a substantial stock of international reserves – and some to liquidity funding by international government organizations like the IMF and World Bank. Both of these elements suggest an approach to international coordination that mirrors how one might regulate systemic risk domestically.

Emerging markets need to coordinate with its larger brethren on prudent measures like leverage limits (see section C below) and currency reserves. As a reward, these markets could access international lender-of-last-resort facilities during a liquidity event, and, in a systemic crisis in which there is a run on all financial institutions, employ loan guarantees and recapitalizations that are fairly priced and impose low costs on taxpayers. Of course, it would be necessary to shutdown and resolve insolvent institutions to maintain the right incentives in good times.

If national regulators can agree upon a core set of sensible regulatory principles, then the constraints imposed by such alignment would reduce regulatory arbitrage through jurisdictional choice substantially. The central banks could present their proposals with specific recommendations to their respective national authorities, and seek consensus internationally through the Financial Stability Board or committee of the Bank for International Settlements. The lessons learned from this crisis should be especially useful to aid in these discussions.

C. Macro-prudential regulation: Leverage restrictions vs sector risk-weight adjustments

Given the various conceptual and implementation issues I have raised with current Basel approach of charging capital requirements based on *static* risk-weights of assets, it is worthwhile considering the alternative macro-prudential approaches. The most popular of these approaches is a direct leverage restriction. One variant of this takes the form where it is imposed and enforced at the level of each institution. No risk weights are attached so that (perhaps with the exception of highest-rated government debt), all other assets are treated equally in terms of their potential risks. Then, the leverage restriction is simply that the un-weighted assets of the institution not exceed its equity value by more than a threshold, say 12:1 or 15:1. Alternately, leverage restriction can be imposed at the level of each asset class, for instance, mortgages cannot have loan-to-value ratios that are greater than 80% (as recently employed by the Reserve Bank of India against low-income housing mortgages with LTVs of over 90%).

While apparently simple, these restrictions in fact require fair bit of regulatory oversight and sophistication. If enforcement is weak, the financial sector can evolve a

“shadow banking” system, as was the primary problem in the United States in build-up to the crisis. The regulation must now ensure that all assets – on- and off-balance-sheet – are suitably accounted for in leverage calculations (for instance, by charging the recently founded Council of regulators in India to take a macro-view of various assets and markets and ensuring that commonly agreed leverage restrictions are met). Similarly, if regulators have to use coarse leverage measurements on complicated securities and derivatives, regulatory arbitrage would push the financial sector towards innovation of such products. Again, this would call for sufficiently broad-scoped asset-level leverage requirements. While it is conceivable that it would be useful to “ban” outright certain derivatives and innovation, there is no evidence that by and large this has worked. Regulators are often playing catch-up to the financial sector. Hence, more prudent enforcement would ensure that regulatory perimeter is irrefutably enforced, so that ALL assets/risks of the financial sector are dealt with adequately while limiting leverage of the system.

Another macro-prudential approach that is employed by some central banks in emerging markets (such as employed by the Reserve Bank of India during 2006-07 in dealing with the housing boom), is the sector-weight adjustment approach. This approach requires horizontal aggregation of financial institutions’ balance-sheets and risk exposures to identify over time – say each year – which asset classes are being “crowded in” as far as systemic risk concentrations are concerned. For instance, if mortgages or mortgage-backed securities are increasingly picking up the lion share of all risks on bank balance-sheets, then the regulators could proactively react to limiting any further build-up. This could be achieved for instance by increasing the risk weights on future exposures to this asset class. In principle, stress tests could also be employed to glean such information about emerging pockets of risk concentrations.

One advantage of dynamic sector risk-weight adjustment approach is that if it is consistently implemented by regulators and anticipated by the financial sector, then it can act as a valuable countercyclical incentive. Financial firms anticipating the future risk in risk weights may stop adding exposure to an asset class once it is sufficiently crowded in. One disadvantage is that it may create a race to “get in first” and also relies heavily on regulatory discretion turning out to be prescient in identifying risk pockets and having sufficient will in good times to lean against the wind of fast-growing asset classes.

Of course, there is no reason why the various approaches outlined above could not be used in conjunction. Good regulation should look for robustness or resilience, both to its own potential errors as well as to the arbitrage of regulation by the financial sector. Rule-based approaches such as in the Basel capital requirements above exonerate the regulators from relying too much on discretion and therefore from influence activity by the industry; discretionary-based approaches counter-balance by making regulation sufficiently dynamic and adaptive as well as by creating constructive ambiguity in minds of the industry about increasing correlated risks and leverage. My recommendation, however, is that discretionary approaches such as sector-based risk adjustments also be sufficiently rule-based, to the extent possible, in terms of the principles of the framework guiding the adjustments.

D. Government fiscal policy and debt management

As Figures 4, 5 and 6 showed, when a full-fledged financial crisis hits an economy, the government balance-sheet gets embroiled too, and the worse the starting condition of the government balance-sheet (in terms of its debt to GDP ratio, for instance), the worse is its ability to deal and cope with the crisis. This effect on Eurozone countries – and the somewhat muted but still significant effect on the United States – suggests that governments should manage their fiscal policy and debt levels in a manner that is counter-cyclical to the rest of the economy. In context of India, the increasing fiscal deficits suggest a potentially worrisome path where the high-growth and boom phase of the economy is coincident with a somewhat profligate government. India's financial sector is not yet too deep, in that fixed income markets are currently poorly developed, so that there is great reliance on the banking sector. While the Reserve Bank of India has historically done a prudent job of containing banking sector's potential excesses, and the well-developed equity market counter-balances to some extent the lack of thriving fixed-income markets, it is clear nevertheless that there is a great deal of "fat" in government's fiscal condition. There are excessive subsidies to farming and fuel, there are explicit and implicit government guarantees to state-owned banks, and a number of state-owned enterprises and sectors are poorly run and managed. A tidying up of the government balance-sheet on pretty much all of its dimensions may be India's best preparation for any risks that it is exposed to, internally or externally.

References

Acharya, Viral V., Thomas Cooley, Matthew Richardson, and Ingo Walter (Eds), 2010, *Regulating Wall Street: The Dodd-Frank Act and the New Architecture of Global Finance*, John Wiley & Sons.

Acharya, Viral V., Thomas Cooley, Matthew Richardson, and Ingo Walter (Eds), 2011, *Dodd-Frank: One Year On*, NYU-Stern and CEPR e-book at www.voxeu.org

Acharya, Viral V., Itamar Drechsler and Philipp Schnabl, 2010, "A Pyrrhic Victory? – Bank Bailouts and Sovereign Credit Risk", Working paper, NYU-Stern.

Acharya, Viral V. and Nirupama Kularni, 2010, "State Ownership and Systemic Risk: Evidence from the Indian financial sector during 2007-09", Working paper, NYU-Stern.

Acharya, Viral V., Lasse Pedersen, Thomas Philippon and Matthew Richardson, 2010, "Measuring Systemic Risk", Working paper, NYU-Stern.

Acharya, Viral V., Philipp Schnabl and Gustavo Suarez, 2009, "Securitization without risk transfer", Working paper, NYU-Stern.

Acharya, Viral V., Stijn van Nieuwerburgh, Matthew Richardson and Lawrence White, 2011, *Guaranteed to Fail: Fannie Mae, Freddie Mac and the Debacle of Mortgage Finance*, Princeton University Press.

APPENDIX

BASEL III: THE REFORM PROPOSALS SUMMARY

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JANUARY 2011

Focus on two aspects of the crisis

- **Capital Adequacy** to withstand individual and systematic shocks
- **Liquidity Adequacy** to meet disruptions in the inter-bank and asset markets

CAPITAL ADEQUACY: OVERVIEW

1. Addition of a stress VaR (SV) and an incremental risk capital charge (IRC) to the market risk capital requirement.

$$\text{Market Risk Capital} = [\text{Var (99\%)} \times \sqrt{10} \times 3] + \text{IRC} + \text{SV}$$

2. Create incentives for banks to trade derivatives through central clearing houses (parties) or CCP rather than bilateral. Trades through CCP would

- have a 2% risk weight, compared to much higher weights for bilateral trades as per Basel II.
3. Mitigate reliance on external credit ratings (S and P, Moody's). Requirements for banks to perform their own credit risk assessments to avoid the "unrated borrowers" loophole that currently has an 8% capital requirement under the standardized model.
 4. Introduce a new "simple" leverage ratio as a supplementary measure to risk-based capital. Leverage ratio is to be set at 3%.
 5. Reduce the effects of "procyclicality," i.e., bank capital and reserves falling in times of crisis, through a systematic risk capital "Buffer" and a conservation of capital buffer.
 6. Additional capital may be required of systemically important banks, e.g., through the issuance of "Contingent Capital" and higher IRB correlations.
 7. To ensure sufficient capital, Tier 1 is redefined to ensure a sufficient "common equity component, i.e., where common equity is common shares plus retained earnings minus goodwill.

CAPITAL ADEQUACY DETAILS

Calibration of the Capital Framework

8. Capital requirements and buffers (all numbers in percent)

	Common Equity Tier 1	Tier 1 Capital	Total Capital (Tier 1 plus Tier)
Minimum	4.5	6.0	8.0
Conservation buffer	2.5		
Minimum plus conservation buffer	7.0	8.5	10.5
Countercyclical buffer range	0 - 2.5		

- Where common equity = [retained earning + common shares – goodwill].
- Other tier 1 capital = instruments with no maturity dates or incentives to redeem, but may be callable by issuer after 5 years only if replace instrument with “better” capital.
- Tier 2 Capital contains “equity like instruments” as before such as:
 - Instruments subordinated to depositors and general creditors of the bank
 - Minimum original maturity of 5 years requirements to be phased in by 2015.

9. Correlations

Under the IRB correlation for borrower exposures is now calculated for larger financial institutions (assets > \$100 million) as:

$$\text{Correlation (R_FI)} = 1.25 \times [0.12 \times (1 - \text{EXP}(-50 \times \text{PD})) / (1 - \text{EXP}(-50))] + 0.24 \times [1 - (1 - \text{EXP}(-50 \times \text{PD})) / (1 - \text{EXP}(-50))]$$

The original Basel II correlation is multiplied by 1.25 for larger banks. This increases correlations among large FIs.

10. Capital Conservation Buffers

- Basel III requires banks to hold (build-up) capital outside periods of stress e.g., by reducing discretionary distributions of earnings (reduced dividends, share buy-backs and staff bonuses) minimum capital buffer is 2.5% of risk-weighted assets (comprised of Tier 1 common equity). Constraints on earnings payouts will be imposed as the buffer is approached or breached on earning distributions such as dividends, share buy backs and “bonus” payments capital buffer phased in between 2016 and 2018. Fully effective 2019.

Individual Bank Minimum Capital Conservation Standards

Common Equity Tier 1 Ratio	Minimum Capital Conservation Ratios (expressed as a percentage of earnings)
4.5% - 5.125%	100%
>5.125% - 5.75%	80%
>5.75% - 6.375%	60%
>6.375% - 7.0%	40%
>7.0%	0%

- As can be seen the lower the buffer the greater the constraint on discretionary payout of earnings (100% to 0%).

11. Countercyclical Buffer

- Losses can be large when a downturn is preceded by a period of excess credit growth.
- These losses can impact the real sector.
- The countercyclical buffer will be imposed when there has been excess aggregate credit growth, which is likely to be relatively infrequent.
- To be imposed by national regulatory authorities at their discretion. International banks will pay the weighted average buffer charge based on their credit exposures to each country.

- Countercyclical buffer will vary between 0% and 2.5% of risk weighted assets.
- Banks given 12 months to adjust to the buffer level.
- Countercyclical buffer must be met with Tier 1 common equity capital.
- If below the buffer restrictions on earnings payouts will apply.

Individual Bank Minimum Capital Conservation Standards, When a Bank is Subject to a 2.5% Countercyclical Requirement

Common Equity Tier 1 Ratio (including other fully loss absorbing capital)	Minimum Capital Conservation Ratios (expressed as a percentage of earnings)
4.5% - 5.75%	100%
>5.75% - 7.0%	80%
>7.0% - 8.25%	60%
>8.25% - 9.5%	40%
>9.5%	0%

12. The Leverage Ratio

In addition to the risk-based capital ratio, a simple transparent leverage ratio of 3% to be introduced.

$$LR = \frac{\text{Tier 1 Capital}}{\text{Total exposure (on+off balance sheet)}} > 3\%$$

- Total exposure based on the size of the banks balance sheet (on) net of provisions.

- Off balance sheet exposure is current exposure plus add-on for future exposure as per Basel II for derivatives.
- For off balance sheet credit (loan) commitments a conversion factor of 100% should be applied unless the commitments are immediately cancelable. In this case a conversion factor of 10% is appropriate.

13. Liquidity Overview

- To date no international standards, Basel III seeks to introduce them
- Liquidity coverage ratio (LCR) → 2015
- Net stable funds ratio (NSFR) → 2018

LCR = Liquidity Coverage Ratio (2015)

- Designed to ensure sufficient high quality liquid assets to offset a net cash-outflow stress scenario lasting one month.

NSFR = Net Stable Funding Ratio (2018)

- Ensure banks have more stable (long-term) sources of funds on an ongoing basis to fund long-term assets.

LIQUIDITY RATIOS DETAILS

14. LCR

Definition of the standard

$$\frac{\text{Stock of high-quality liquid assets}}{\text{Total net cash outflows over the next 30 calendar days}} \geq 100\%$$

- To be reported monthly.

15. Stock of High Quality Liquid Assets (numerator of ratio)

- Liquid assets must remain liquid in times of stress, i.e., convertible into cash at little loss of value and can be used at the central bank discount window as collateral.
- The liquid assets must be “unencumbered.”
- Liquid assets divided into level 1 and level 2. Level 1 amount no cap, level 2 amount capped at 40% of total.

Level 1 = cash + central bank reserves + sovereign debt.

Level 2 = [Mtge backed securities government guaranteed] + [corporate bonds (plain vanilla) rated at least AA-].

- A 15% “Haircut” has to be applied to the value of each level 2 asset.

16. Total Net Cash Outflow (Denominator of ratio)

Total *net* cash outflows over the next 30 calendar days = outflows - Min {inflows; 75% of outflows}.

17. Outflows

- Retail Deposits = Stable + Less Stable.

Stable = Minimum Run-Off Factor of 5%.
Less Stable = Minimum Run-Off Factor of 10%.

- Retail Deposits with maturity > 30 days and no early withdrawal (0% run-off factor).
- All unsecured wholesale funds with < 30 days maturity (i.e., callable by funds provider) have 100% run-off factor.
- Secured funds backed by level 1 assets (0% run-off factor), backed by level 2 assets (15% run-off factor)
- Loss of funding on commercial paper if maturity <30 days (100% run-off factor).
- All debt maturing with 30 days (100% run-off factor).
- Loan commitment (draw down) factors:
 - (a) 5% draw-downs on committed credit and liquidity facilities to retail and small business customers.
 - (b) 10% draw-downs on committed **credit** facilities to non-financial corporate, sovereigns and central banks, public sector entities and multilateral development banks.
 - (c) 100% draw-downs on committed **liquidity** facilities to non-financial

corporate, sovereigns and central banks, public sector entities, and multilateral development banks.

(d) 100% *draw-downs on committed credit and liquidity facilities to other legal entities*. These entities include financial institutions (including banks, securities firms, and insurance companies), conduits and special purpose vehicles, fiduciaries beneficiaries.

- Cash outflows related to operating costs (0% run-off factor)

18. Inflows

- Only include inflows for sources where no default expected in next 30 days.
- There is a 75% cap on inflows meeting outflows so banks don't just rely of inflows for liquidity.
- Assume that no lines of credit on other banks can be drawn on (0% inflow)
- Assume 100% inflow received on wholesale loans and 50% inflow on retail loans from counterparties.
- 100% inflow on known derivative payments.

19. Net Stable Funding Ratio

- Reported Quarterly
- Aimed to ensure that long-term assets are funded with a minimum amount of stable liabilities.
- It limits reliance on short-term wholesale funding, a major problem in the crisis.

$$NSFR = \frac{\text{Available amount of stable funding}}{\text{Required amount of stable funding}} > 100\%$$

Basically seek stable funding for all illiquid assets and securities held, where stable funding is defined as equity and liability financing expected to be reliable sources of funds over a one-year time horizon.

20. Available Stable Funding (numerator of ratio)

- Bank Capital
- Pref stock maturity > 1 year.
- Liabilities with maturities > 1 year.
- Portion of retail deposits and wholesale deposit expected to stay with bank during a period of idiosyncratic stress.

Components of Available Stable Funding and Associated ASF Factors

ASF Factor	Components of ASF Category
100%	<ul style="list-style-type: none"> • The total amount of capital, including both Tier 1 and Tier 2 as defined in existing global capital

	<p>standards issued by the Committee.</p> <ul style="list-style-type: none"> • The total amount of any preferred stock not included in Tier 2 that has an effective remaining maturity of one year or greater taking into account any explicit or embedded options that would reduce the expected maturity to less than one year. • The total amount of secured and unsecured borrowings and liabilities (including term deposits) with effective remaining maturities of one year or greater excluding any instruments with explicit or embedded options that would reduce the expected maturity to less than one year. Such options include those exercisable at the investor’s discretion within the one-year horizon.
90%	<ul style="list-style-type: none"> • “Stable” non-maturity (demand) deposits and/or term deposits (as defined in the LCR in paragraphs 55-61) with residual maturities of less than one year provided by retail customers and small business customers.
80%	<ul style="list-style-type: none"> • “Less stable” (as defined in the LCR in paragraphs 55-61) non-maturity (demand) deposits and/or term deposits with residual maturities of less than one year provided by retail and small business customers
50%	<ul style="list-style-type: none"> • Unsecured wholesale funding, non-maturity deposits and/or term deposits with a residual maturity of less than one year, provided by non-financial corporate, sovereigns, central banks, multilateral development banks and PSEs.
0%	<ul style="list-style-type: none"> • All other liabilities and equity categories not included in the above categories.

21. Required Stable Funding (denominator of ratio)

Detailed Composition of Asset Categories and Associated RSF Factors

Components of RSF Category	RSF Factor
<ul style="list-style-type: none"> • Cash immediately available to meet obligations, not currently encumbered as collateral and not held for planned use (as contingent collateral, salary payments, or for other reasons) • Unencumbered short-term unsecured instruments and transactions with outstanding maturities of less than one year. • Unencumbered securities with slated remaining maturities of less than one year with no embedded options that would increase the expected maturity to more than one year. • Unencumbered securities held where the institution has an offsetting reverse repurchase transaction when the security on each transaction has the same unique identifier (e.g. ISN number or CUSIP). • Unencumbered loans to financial entities with effective of less than one year that are not renewable and for which the lender has an irrevocable right to call. 	0%
<ul style="list-style-type: none"> • Unencumbered marketable securities with residual maturities of one year or greater representing claims on or claims guaranteed by sovereigns, central banks, BIS, IMF, EC, non-central government PSEs) or multilateral development banks that are assigned a 0% risk-weight under the Basel II standardized approach, 	5%

provided that active repo or sale-markets exist for these securities.	
<ul style="list-style-type: none"> • Unencumbered corporate bonds or covered bonds rated AA- or higher with residual maturities of one year or greater satisfying all of the conditions for Level 2 assets in the LCR, outlined in paragraph 42(b). • Unencumbered marketable securities with residual maturities of one year or greater representing claims on or claims guaranteed by sovereigns, central banks, non-central government PSEs that are assigned a 20% risk-weight under the Basel II standardized approach, provided that they meet all of the conditions for Level 2 assets in the LCR, outlined in paragraph 42(a). 	20%
<ul style="list-style-type: none"> • Unencumbered gold. • Unencumbered equity securities, not issued by financial institutions or their affiliates, listed on a recognized exchange and included in a large cap market index. • Unencumbered corporate bonds and covered bonds that satisfy all of the following conditions: <ul style="list-style-type: none"> - Central bank eligibility to intraday liquidity needs and overnight liquidity shortages in relevant jurisdictions. - Not issued by financial institutions or their affiliates (except in the case of covered bonds). - Not issued by the respective firm itself or its affiliates. - Low credit risk: assets have a credit assessment by a recognized ECAI of A+ to A-, or do not have a credit assessment by a recognized ECAI and are internally 	50%

<ul style="list-style-type: none"> - Traded in large, deep and active markets characterized by a low level of concentration. • Unencumbered loans to non-financial corporate clients, sovereigns, central banks, and PSEs having a remaining maturity of less than one year. 	
<ul style="list-style-type: none"> • Unencumbered residential mortgages of any maturity that would qualify for the 35% or lower risk weight under Basel II Standardized Approach for credit risk. • Other unencumbered loans, excluding loans to financial institutions, with a remaining maturity of one year or greater, that would qualify for the 35% or lower risk weight under Basel II Standardized Approach for credit risk. 	65%
<ul style="list-style-type: none"> • Unencumbered loans to retail customers (i.e., natural persons) and small business customers (as defined in the LCR) having a remaining maturity of less than one year (other than those that qualify for the 65% RSF above). 	85%
<ul style="list-style-type: none"> • All other assets not included in the above categories 	100%

- Off Balance exposures require little long-term funding. Thus: Revocable and irrevocable credit and liquidity facilities to any client has a RSF ratio = 5%.

22. Other Liquidity Controls

In addition to ratios certain other monitoring tools (metrics) suggested for regulators.

- Contractual maturity mismatch.
- Concentration of funding.
- Available unencumbered assets.

23. Contractual Maturity Mismatch

- Comparing assets with liabilities in time bands based on maturity, e.g., overnight, 7 day, 14 day, 1,2,3,4, and 9 months, 1,2,3,5 and 5 years and beyond.
- Data to be provided to supervisors by banks on frequent basis.

24. Concentration of Funding

Metrics Include

A. **Funding liabilities sourced from each significant counterparty**

The bank's balance sheet total

B. **Funding liabilities sourced from each significant product/instrument**

The bank's balance sheet total

C. **List of asset and liability amounts by significant currency**

Where:

Significant Counterparty Funds >1% of Bank Balance-Sheet.

Significant Instrument Accounts for >1% of Bank Balance-Sheet.

Significant Currency is >5% of Bank Liabilities.

Assessed in time buckets, >1 month, 1-3 months, 3-6 months, 6-12 months, >12 months.

25. Unencumbered Assets

- These can be used as collateral to raise additional secured funding.
- Amount of available unencumbered assets that are marketable as collateral in for central banks' discount facilities.

26. Market Risk Revisions (July 2009)

Basel III also includes revisions to the Basel II framework for market risk. In addition to the Basel II market risk VaR (Internal Model) where under Basel II:

- (a) VaR computed on a daily basis.
- (b) At a 99% confidence level.
- (c) Over a 10 day holding period.
- (d) With an overall multiplier of 3 times VaR imposed

27. Stressed Value Risk Measure under Basel III

Banks must also calculate a "Stressed Value at Risk Measure" based on a 10 day holding period, 99th percentile VaR with model inputs based on a 12 month period (250 days) of a period of continuous stress (e.g., 2007, Russian crisis etc...)

- The capital requirement (C) is equal to:

$$C = \max \{VaR_{t-1}; m_c \cdot VaR_{avg}\} + \max \{sVaR_{t-1}; m_s \cdot$$

$sVaR_{avg}\}$ $VaR_{t-1} = VaR$ yesterday

VaR_{avg} = average VaR over a 60 day period

$sVaR_{t-1}$ = stressed VaR latest available day

$sVaR_{avg}$ = average VaR over a 60 day stressed period

m_c = multiplication factor of 3 (minimum)

m_s = multiplication factor of 3 (minimum)

- Multiplication factor can be increased by up to 1.

If model performs poorly based on back testing by regulators as per “traffic light” system under Basel II

28. Incremental Risk Capital Measure (IRC) under Basel III

- In addition, banks with internal risk models will be required for some credit risk sensitive assets to calculate an incremental risk capital (IRC) charge that reflects the default and migration risk of that trading asset measured over a 12 week period i.e., a scaling factor of 1 times the maximum of (i) the average of the incremental risk measure over 12 weeks and (ii) the most recent incremental risk measure.

Thus:

Market Risk Capital under Basel III = Normal Market Risk Capital + Stressed Market Risk Capital + Incremental Risk Capital

29. Tier III Capital (e.g., that included short-term bonds issued by a bank) and was introduced for the market risk calculation under Basel II is to be phased out under Basel III.

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