

THINKING BEYOND BASEL III: NECESSARY SOLUTIONS FOR CAPITAL AND LIQUIDITY

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In previous studies, the OECD has identified the main hallmarks of the crisis as too-big-to-fail institutions that took on too much risk, insolvency resulting from contagion and counterparty risk, the lack of regulatory and supervisory integration, and the lack of efficient resolution regimes. This article looks at how the Basel III proposals address these issues, helping to reduce the chance of another crisis like the current one. The Basel III capital proposals have some very useful elements, notably a leverage ratio, a capital buffer and the proposal to deal with pro-cyclicality through dynamic provisioning based on expected losses. However, this report also identifies some major concerns. For example, Basel III does not properly address the most fundamental regulatory problem that the 'promises' that make up any financial system are not treated equally. This issue has many implications for the reform process, including reform of the structure of the supervision and regulation process and whether the shadow banking system should be incorporated into the regulatory framework and, if so, how. Finally, modifications in the overall risk-weighted asset framework are suggested that would deal with concentration issues.

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A. Introduction

The consultative documents entitled “Strengthening the Resilience of the Banking Sector” (henceforth referred to as ‘Basel III’) and “International Framework for Liquidity Risk Measurement, Standards and Monitoring” are a part of the Basel Committee’s ongoing work in response to the crisis. This paper reviews the proposal, and asks whether they provide a basis for reform that will help to avoid crises in the future.

Sudden changes in asset quality and value can quickly wipe out bank capital. Where short-term wholesale liabilities fund longer-term assets, failure to roll over short-term financial paper, or a ‘run’ on deposits, can force de-leveraging and asset sales. Banking crises associated with such changes are often systemic in nature, arising from the interconnectedness of financial arrangements: banks between themselves, with derivative counterparties and with direct links to consumption and investment spending decisions. In history, banking crises have been associated with major economic disruption and recessions. It is for this reason that policy makers regulate the amount of capital that banks are required to hold, and require high standards of corporate governance, including liquidity management, accounting, audit and lending practices.

This paper first looks at the Basel system historically, and then summarises all of the key problems with it – all of which contributed in some part to its failure to help to avoid the recent global financial crisis. In section C the paper summarises the recent Basel III proposals, and section D critically analyses them. Section E sets out the liquidity proposals and a brief critique. Finally section F provides a summary and draws implications for the financial reform process.

B. The Basel system historically

Basel capital weighting in place from 1992

Capital regulations under Basel I came into effect in December 1992 (after development and consultations since 1988). The aims were: first, to require banks to maintain enough capital to absorb losses without causing systemic problems, and second, to level the playing field internationally (to avoid competitiveness conflicts).

A minimum ratio of 4% for Tier 1 capital (which should mainly be equity less goodwill) to risk-weighted assets (RWA) and 8% for Tier 1 and Tier 2 capital (certain subordinated debt etc).¹ The Basel I risk weights for different loans are shown on the left side of Table 1.

A ‘revised framework’ known as Basel II was released in June 2004 (BCBS, 2004) after many issues with Basel I, most notably that regulatory arbitrage was rampant (Jackson, 1999). Basel I gave banks the ability to control the amount of capital they required by shifting between on-balance sheet assets with different weights, and by securitising assets and shifting them off balance sheet – a form of disintermediation. Banks quickly accumulated capital well in excess of the regulatory minimum and capital requirements, which, in effect, had no constraining impact on bank risk taking.

Basel I and II fail to stop global crisis

As the centrepiece for capital regulation to avoid crises the Basel approach has failed in its 1st and 2nd formulations and the world is still dealing with the after effects of the greatest financial crisis since the Great Depression.

Pillar 1 of the Basel II system defines minimum capital to buffer unexpected losses. Total RWA are based on a complex system of risk weighting that applies to ‘credit’, ‘market’ (MR) and ‘operational’ risk (OR), which are calculated separately and then added:

$$\text{RWA} = \{12.5(\text{OR} + \text{MR}) + 1.06 * \text{SUM}[w(i)A(i)]\} \quad (1)$$

where: $w(i)$ is the risk weight for asset i ; and $A(i)$ is asset i ; OR and MR are directly measured and grossed up by 12.5 for 8% equivalence; and credit risk is the sum of the various asset classes, each weighted by its appropriate risk weight. A scaling factor applied to this latter term, estimated to be 1.06 on the basis of QIS-3 data (but subject to change), was envisaged for the transition period, which was supposed to start for most countries in January 2008. Banks were to be able to choose between: first, a simplified approach (for smaller institutions without the capacity to model their business in risk terms) by using the fixed weights shown in column two of Table 1; second, an approach based on external ratings (shown in the column three in Table 1); and third, an internal ratings-based (IRB) approach for sophisticated banks, driven by their own internal rating models (see the right side of Table 1).

Basel II, more detailed, reduced weights

The simplified Basel II approach is more ‘granular’ than Basel I, but retains its basic features. It is striking in light of the financial crisis that the simplified approach shows the Basel Committee cutting the risk weight to mortgages by some 30% (from 50% to 35%) and much more in the sophisticated version. The weight for lending between banks was only 20% under Basel I, kept the same under the simplified Basel II, and is likely to be cut by 20 to 30% under the sophisticated approach.

Complex modelling

The IRB approach requires banks to specify the probability of default (PD) for each individual credit, its loss-given-default (LGD), and the expected exposure at default (EED). This requires highly-complex modelling and aggregation, and offers banks with the necessary expertise the possibility of deriving more risk-sensitive weights. This approach requires the approval of the bank’s supervisor.

Table 1. Basel I and Basel II risk weights and commentary

Risk Weights Under Basel I and Basel II (Pillar I), %						
SECURITY	BASEL I	BASEL II Simplified Standardised	BASEL II Standardised based on External Ratings	BASEL II Advanced: Internal Ratings Based (IRB)		
				2004-05 QIS 4 Avg % chg in portf. MRC	2004-05 QIS 4 Median % Chg in portf. MRC	Basel II Advanced IRB
Most Government/central bank	0	0		0	0	Comes close to letting banks set their own Pillar 1 capital, with supervisory oversight. Risk weights depend on internal estimates of a loan's probability of default; loss-given-default; exposure to loss. These are based on the banks' own complex risk models, relying on subjective inputs and often on unobservable (e.g. OTC illiquid securities) prices. Pillar 2 provides for supervisory oversight. With stress testing, and guidance from supervisors, banks can be made to hold capital for risks not adequately captured under Pillar 1. Pillar 3 is disclosure and market discipline which relies on some notion of market efficiency. Rational markets punish poor risk managers.
AAA to AA-			0			
A+ to A-			20			
BBB+ to BBB-			50			
BB+ to B- (& unrated)			100			
Below B-			150			
Other public (supervisors discretion)	0-50	0		0	0	
Claims on MDBs	20	0		-21.9	-29.7	
Most OECD Banks & Securities firms	20	20	<90days	-21.9	-29.7	
AAA to AA-			20			
A+ to A-			20			
BBB+ to BBB- (& unrated)			20			
BB+ to B-			50			
Below B-			150			
Residential Mortgages-fully secured	50	35	35	-61.4	-72.7	
Retail Lending (consumer)	100	75	75	(-6.5 to -74.3)	(-35.2 to -78.6)	
Corporate & Commercial RE	100	100		(-21.9 to -41.4)	(-29.7 to -52.5)	
AAA to AA-			20			
A+ to A-			50			
BBB+ to BB- (& unrated)			100			
Below BB-			150			

Sources: BIS (1988) and BIS (final version June 2006); FDIC (2005); authors' commentary.

1. Problems with Pillar 1

a) Portfolio invariance

No concentration penalty in Pillar 1

The risk weighting formulas in the Basel capital regulations are based on a specific mathematical model, developed by the Basel Committee, which is subject to the restriction that it be 'portfolio invariant'; that is, the capital required to back loans should depend only on the risk of that loan, not on the portfolio to which it is added (Gordy, 2003). This is convenient for additivity and application across countries. But it has an important disadvantage: it does not reflect the importance of diversification as an influence on portfolio risk. Thus the minimum capital requirements associated with any type of loan due to credit risk simply rise linearly with the holding of that asset type, regardless of the size of the exposure (that is, appropriate diversification is simply assumed). This means that it does not penalise portfolio concentration (as might occur for example under a quadratic rule applied to deviations from a diversified benchmark; see below). Concentration issues are left to supervisors in Pillar 2.

b) Single global risk factor

No country-specific risk

For the mathematical model underlying the Basel approach (I or II), each exposure's contribution to value-at-risk (VaR) is portfolio invariant only if: (a) dependence across exposures is driven by a single systemic risk factor – a global risk factor, since it is supposed to apply to global banks operating across countries; and (b) each exposure is small (Gordy, 2003). What we know of the sub-prime crisis is that it originated in the US housing market (regional sector risk in this framework) and exposures were quite large.

Of the two conditions for invariance, by far the most important is the requirement of a single risk factor that applies to all participants. Almost prophetically, Gordy (2003) says:

A single factor model cannot capture any clustering of firm defaults due to common sensitivity to these smaller scale components of the global business cycle. Holding fixed the state of the global economy, local events in, for example, France are permitted to contribute nothing to the default rate of French obligors. If there are indeed pockets of risk, then calibrating a single factor model to a broadly diversified international credit index may significantly understate the capital needed to support a regional or specialized lender.²

c) Different treatment of financial ‘promises’: complete markets in credit undermine capital weighting approaches

CDS destroys notions of ex ante risks in the specific financial institutions

The Basel risk-weighting approach in fact encourages portfolio concentrations in low-weighted assets like government bonds, mortgages and lending between banks – there is always an incentive to economise on capital and expand business into lower-weighted areas. Unfortunately, this approach evolved at the same time as did the market for credit default swaps (CDS). Prior to the CDS contract it was not possible to go short in credit, unlike in other markets. The credit markets were “incomplete”. The CDS contract created the potential for complete markets in credit. The banks were able to transform the buckets of risk themselves with derivatives, thus undermining the fundamental idea of capital weights, without having to trade as much on the underlying securities on primary markets (favouring assets with low-risk weights).

This issue is about promises in the financial system. If regulations treat promises differently in different sectors, then with complete markets in credit, the promises will be transformed into those with the lowest capital charges.

d) Bank capital market activities

Contagion and counterparty risk as hallmarks

In many ways the main hallmarks of the global financial crisis were the contagion and counterparty risks. Both of these arose from banks involving themselves in capital market activities for which they did not carry sufficient capital. Securitisation and its warehousing on and off-balance sheet proved to be a major problem. In the US, Variable Interest Entities (VIEs) to which banks are linked had to be consolidated onto balance sheets if banks became insolvent or if liquidity of funding became problematic. This was completely missed in the capital regulations. Similarly, counterparty risk became a major issue with the failures of Lehman Brothers and AIG. In the latter case, the banks exposed relied on public compensation to ensure that the crisis did not make them insolvent.

e) Pro-cyclicality

The capital regulations are pro-cyclical...

The Basel system is known to be pro-cyclical. There are many reasons for this. The most basic reason is that judgments tend to underestimate risks in good times and overestimate them in bad times. More specific factors include:

- Leverage ratios depend on current market values (and are therefore high in good times and low in bad times). If asset values do not accurately reflect future cash flows, pro-cyclicality results;
- Banks' risk measurements tend to be point-in-time and not holistic measures over the whole cycle;
- Counterparty credit policies are easy in good times and tough in bad; and
- Profit recognition and compensation schemes encourage short-term risk taking, but are not adjusted for risk over the business cycle.

Capital regulation under previous Basel regimes did nothing to counter this pro-cyclicality. Banks can control their RWA via regulatory arbitrage and by varying bank capital more directly via dividend and share buyback policies (high dividends and buybacks in the good times and vice versa).

...particularly when banks estimate PD, LGD and EAD

The IRB approach of the revised framework actually institutionalises this pro-cyclicality by making banks themselves responsible for estimating Probability of Default (PD), Loss Given Default (LGD) and Exposure at Default (EAD), which are all a function of the cycle, and are led by the stock market, asset values and other financial variables. Private bankers cannot predict future asset prices and future volatility events. The simplified system changed nothing relative to Basel I, and the external ratings based approach still used credit ratings, which are notoriously pro-cyclical.

f) Subjective inputs

Risk inputs are subjective. Some prices are of the over-the-counter variety and are not observable, nor do they have appropriate histories for modelling purposes. Banks can manipulate inputs to reduce capital required. For these sorts of reasons, the Basel Committee envisaged that Pillar 2 would deal with risks not appropriately covered in Pillar 1.³

g) Unclear and inconsistent definitions

The main problems here have been the definition of capital.

- Regulatory adjustments for goodwill are not mandated to apply to common equity, but are applied to Tier 1 and/or a combination of Tier 1 and Tier 2.
- The regulatory adjustments are not applied uniformly across jurisdictions opening the way for further regulatory arbitrage.
- Banks do not provide clear and consistent data about their capital.

This means that in a crisis the ability of banks to absorb losses is compromised and different between countries – exactly as seen in the crisis.

2. Problems with Pillars 2 and 3

Supervisors can't be forward looking

Pillar 2 relates to the supervisory review process. With stress testing and guidance from supervisors, banks can be made to hold capital for risks not appropriately captured under Pillar 1. Building buffers in this way requires supervisors to be forward looking, that is, to keep up with changes in market structure, practices and complexity. This is inherently difficult. Supervisors may be even less likely to be able to predict future asset prices and volatility than private bankers. Furthermore, supervisors have smaller staff (per regulated entity) and are mostly less well paid. If supervisory practices lag the policy makers will be ineffective in countering defects in Pillar 1.⁴ Pillar 2 is not likely to be effective in a forward-looking way.

In this respect it is worth noting (see below) that the UK Financial Services Authority (FSA), which is one of the best staffed and most sophisticated of supervisors, signed off on Northern Rock to be one of the first banks to go to the Basel II IRB approach, understanding fully that this would reduce their capital significantly, immediately prior to the sub-prime crisis. More recently, the Lehman use of repo 105 to disguise leverage in its accounts was not hidden from supervisors – it appears they did not fully appreciate what they were looking at (Sorkin, 2010).

Markets just aren't efficient

Pillar 3 relies on disclosure and market discipline that will punish banks with poor risk management practices. Underlying this is an efficient markets notion that markets will act in a fully rational way. At the level of markets, the bubble at the root of the sub-prime crisis, and crises before it, suggest the systematic absence of informational efficiency. The whole pro-cyclicality debate concerning the Basel system is premised on the idea that asset prices do not reflect future cash flows accurately.

C. 'Basel III' proposals for reform

Trading book market risk changes

Basel II, to all intents and purposes, never came properly into effect. In July 2009 the Basel Committee already adopted changes that would boost capital held for market risk in the trading book portfolio (see MR in equation 1 above) – in essence applying a multiplier of 3 to VaR specific risk and to stressed VaR risk in the calculation (BCBS, 2009a). The quantitative impact study has shown, oddly, that the average capital requirement for banks in the study would rise by 11.5%, but the median would only rise by 3.2% (BCBS, 2009b). More capital of course is to be welcomed. The consultative document issued by the Basel Committee in December 2009 aims to fix some of the problems noted above. This paper focuses on these new proposals on capital.

1. To raise the quality, consistency and transparency of the capital base

Common equity is good

Tier 1 capital will consist of going concern capital in the form of common equity (common shares plus retained earnings) and some equity-like debt instruments which are both subordinated and where dividend payments are discretionary. Criteria for Tier 2 capital will also be tightened (subordinate to depositors, five-year minimum maturity and no incentives to redeem). After a quantitative impact study, it is proposed to fix minima for common equity as a

percentage of RWA, and similarly for Tier 1 capital and total capital. It is proposed to abolish Tier 3 capital.

Remove...

As far as improving the definition of capital is concerned, the report stresses that equity is the best form of capital, as it can be used to write off losses. Not included in (to be deducted from) common equity are:

...goodwill...

- Goodwill. This can't be used to write off losses.

...minority interest...

- Minority interest. That if a company takes over another with a majority interest and consolidates it into the balance sheet, the net income of the 3rd party minorities can't be retained by the parent as common equity.

...deferred tax assets...

- Deferred tax assets (net of liabilities). These should be deducted if they depend on the future realization of profit (not including tax pre-payments and the like that do not depend on future profitability).

...and investments in other financial institutions

- Bank investments in its own shares.
- Bank investments in other banks, financial institutions and insurance companies – all cross-share holdings and investments in sister companies, all holdings if a bank's position in another institution is 10% or more, and an aggregation adjustment of all holdings that amount to more than 10% of common equity. The aim here is to avoid double counting of equity.
- Provisioning shortfalls (see below).
- Other deductions. Such as projected cash flow hedging not recognised on the balance sheet that distorts common equity; defined benefit pension holdings of bank equity; some regulatory adjustments that are currently deducted 50% from Tier 1 and 50% from Tier 2 not addressed elsewhere.

2. Enhancing risk coverage

One major problem in the crisis was the failure of the Basel approach to capture on and off balance sheet risks (related Special Purpose Vehicles (SPVs) for example). Going forward, it is proposed that banks:

Use "stressed" inputs

- Must determine their capital requirement for counterparty credit risk using stressed inputs, helping to remove pro-cyclicality that might arise with using current volatility-based risk inputs.
- Must include capital charges (credit valuation adjustments) associated with the deterioration in the creditworthiness of a counterparty (as opposed to its outright default).

Wrong-way risk

- Implement a Pillar 1 capital charge for wrong-way risk (transactions with counterparties, especially financial guarantors, whose PD is positively correlated with the amount of exposure). This will be done by adjusting the multiplier applied to the exposure amount identified as wrong way risk.

Correlation multiplier

- Apply a multiplier of 1.25 to the asset value correlation (AVC) of exposures to regulated financial firms with assets of at least \$25bn, (since AVC's were 25% higher during the crisis for financial versus non-financial firms). This would have the effect of raising risk weights for such exposures.

Margining periods

- Will be required to apply tougher (longer) margining periods as a basis for determining regulatory capital when they have large and illiquid derivative exposures to a counterparty.

Centralised exchange incentives

- Will qualify for a zero risk weight for counterparty risk exposure if they deal with centralised exchanges (that meet certain criteria): hence creating an incentive to use centralised exchanges (since higher charges will apply for bilateral OTC derivatives).

The Committee is also trying to improve the usefulness of external ratings in the above recommendation, and so proposes to require banks to assess these ratings with their own internal processes.

As with most other aspects of the report, the quantitative impact study will help to calibrate the reforms on coverage.

3. *Leverage ratio****'Backstop' leverage ratio***

The introduction of a leverage ratio is intended to help to avoid the build-up in excess leverage that can lead to a deleveraging 'credit crunch' in a crisis situation. The Committee refers to this as a 'backstop' measure for the risk-based approach. It is proposing a simple leverage ratio based on Tier 1 capital, with a 100% treatment to all exposures net of provisions, including cash and cash-like instruments. Certain off-balance sheet exposures will be included with a 100% credit conversion factor, and written credit protection will be included at its notional value. It is proposed that there be no netting of collateral held and no netting off-balance sheet derivative exposures (more akin to IFRS treatment than to GAAP).

4. *Pro-cyclicality*

The Basel Committee places considerable emphasis on the role of pro-cyclical factors in the crisis resulting from mark-to-market accounting and held to maturity loans; margining practices; and the build-up of leverage and its reversal amongst all financial market participants. The following ideas are proposed to deal with this:

- To dampen the cyclicality of the minimum capital requirement the Committee is looking to focus on longer-term calibration of the probability of default in the modelling of risk; the use of Pillar 2 supervisory override is also being recommended when necessary.

Forward-looking provisioning

- The Committee will promote forward-looking provisioning by strongly supporting the IASB principles to base it on the 'expected' (rather than the current 'incurred') losses of banks' existing portfolios. It also proposes to deduct from bank capital any shortfall in these provisions

(i.e. to expected losses) to provide an incentive against under-provisioning.

Buffers are very important

- Very importantly, the Committee is proposing that banks hold buffers of capital above the regulatory minimum – large enough that they remain above the minimum in periods of significant sector-wide downturns. Furthermore, when the buffers are run down banks would be required to build them again by reducing discretionary dividend distributions, buybacks and staff bonus payments.
- The Committee is proposing that the buffer system might be used in a macro prudential framework to help restrain credit growth when it is perceived as excessive – the buffer would rise and fall in a countercyclical manner.

D. A critical assessment of the capital proposals

There are some very good proposals such as ...

The proposals for capital reform – a new Basel III – do not address the fundamental problems with the risk-weighting approach, but do make some improvements with respect to some aspects of the capital management process under the Basel II regime. In particular:

...a leverage ratio...

Criticism 1.4 on bank capital market activities: This is dealt with by enhancing coverage of counterparty exposure in the Enhancing risk coverage section and by better inclusion of off-balance sheet exposure in the Leverage ratio proposal. However, the introduction of a leverage ratio is likely to be the single most important reform – a theme which is developed more fully below.

... dealing with procyclicality...

Criticism 1.5 on pro-cyclicality issues: The proposals summarised in 2.4 on Pro-cyclicality deserve credit for trying to deal with this difficult area.

- Basing PD on longer-run data to determine inputs for minimum capital is better than the alternative. This pre-supposes that the risk weighting/modelling framework of the Basel system is the best approach, which remains an open question in light of experience (see below).
- Forward-looking provisioning based on expected losses is a useful approach based on accounting principles and gives firms ample scope to manage their businesses in a sensible way. The notion of using better times to build a buffer via restraint on dividends, share buybacks and the like is particularly welcome. This aims to ensure that in bad times regulatory minima for capital are not breached.
- The macro prudential recommendation on credit growth is an admirable objective but likely to perform poorly in practice. The reason for this is leads and lags in modelling credit, and the problem of structural change caused by financial innovation – often in response to the very sort of regulatory changes proposed by the Basel Committee. Credit lags the cycle, and the identification of a ‘bubble’, leading to provisioning to offset it, could easily occur at a time when the economy is beginning to turn down – exacerbating the cycle. Similarly, just as securitization dampened balance sheet credit growth in the past – leading to a false signal that there was no leverage problem – so too might future

developments in the shadow banking system lead to similar distortions that would be difficult for supervisors and other policy makers to identify.

...and moving OTC derivatives on exchanges

Criticism 1.6 on subjective inputs: all of the measures designed to get more OTC derivatives onto exchanges to create more reliable traded price data and improvements in modelling are welcome. There will always be significant subjective inputs however, and the OTC market is likely to remain large in the future. This is because the firm-specific requirements of non-financial and financial firms for tailor-made derivatives suitable to their needs but not to others are not conducive to trading on exchanges.

Criticism 1.7 on Unclear and inconsistent definitions: the proposals summarised in 2.1 to ‘raise the quality consistency and transparency of the capital base’ are all to be welcomed. This recommendation does not appear to be new since one can find the recommendation to deduct goodwill from Tier 1 capital in both Basel I and Basel II documentation. Reinforcing this point in Basel III is important however, as goodwill can’t be included in capital available to absorb losses – mixing intangibles and actual capital is not admissible in any of the capital regimes. Exclusion of minorities⁵ and deferred tax assets⁶ is also sensible.

However, some of the most fundamental problems with Basel I and Basel II have not been dealt with. The following issues are discussed in turn:

- The model framework.
- Regulatory and tax arbitrage.
- The need for more capital.

1. The model framework problems are not addressed

Addressing penalties for concentration

- The weighting system continues to suffer from the assumption of portfolio invariance, or linear weighting that facilitates additivity in the model (criticism 1.1). Hence it does little in Pillar 1 to penalise concentration in portfolios, except insofar as model multipliers depend on exposure size in the treatment of counterparty risk. It may be possible to deal with concentration in Pillar 1, and this should be explored: for example, a quadratic penalty applied to deviations from a diversified benchmark portfolio is a feasible way to deal with the issue – the minimum leverage ratio would apply if a firm was on benchmark, but it would have to add increasingly more capital the more it deviated from benchmarks.

This would certainly help to remove the direct incentives for regulatory arbitrage caused by the Basel weights (see the next section).

A one-size-fits-all approach

The single global risk factor – one size fits all – also still underpins the modelling process (criticism 1.2). There are different forms of risk:

- Credit risk arising from the global business cycle risk factor is suitable for treatment in the Basel analytical approach.

- Security's pricing/market portfolio risk in global capital markets is dealt with in a complex credit risk equivalent way and also is a one size fits all (global business cycle risk factor) approach.

However, idiosyncratic credit risk associated with individual borrowers in different businesses and regions is not well catered for in the analytical framework – leaving Basel III with the same problem as Basel II: undue reliance on cumbersome supervisory override that has not worked well in the past.

2. *The problem of regulatory and tax arbitrage in 'complete' markets and the shifting of financial "promises"*

Can we specify ex-ante risk buckets with complete markets for credit?

"Complete markets" in credit, particularly the possibility to go short credit, make it impossible to expect that specified ex-ante risk buckets will remain stable as a basis for holding capital. Differential capital weights and tax status and tax rates faced by investors cannot be arbitrated away by leveraged trading. They are policy parameters that provide incentives to minimise regulatory and tax costs. There is a massive incentive in financial markets to use "complete market" techniques to reconfigure credits as capital market instruments to avoid capital charges and reduce tax burdens for clients, thereby maximising returns for themselves and their customers. This will continue despite the proposed reforms.

a) Simple example on capital arbitrage and promise shifting

Shifting promises...

- Bank A lends \$1000 to a BBB rated company, 100% risk weighted, by buying a bond and would have to hold \$80 capital. Bank A holds a promise by the company to pay a coupon and redeem at maturity.
- Bank A buys a CDS from Bank B on the bond, shorting the bond, thereby passing the promise to redeem from the company to Bank B. Because B is a bank, which carries a 20% capital weight, Bank A reduces its required capital to 20% of \$80, or \$16.
- You would think that Bank B would have to carry the promise and 100% weight the exposure – but instead it underwrites the risk with a reinsurance company outside of the banking system – the promise to redeem is now outside the banks and the BIS capital rules don't follow it there. Bank B's capital required for counterparty risk is only 8% of an amount determined as follows: the CDS spread price of say \$50 (500bps), plus a regulatory surcharge coefficient of 1.5% of the face value of the bond (*i.e.* \$15), all multiplied by the 50% weighting for off-balance sheet commitments. That is, \$2.60 (*i.e.* $0.08 * \$65 * 0.5$).
- So jointly the banks have managed to reduce their capital required from \$80 to \$18.60 – a 70.6% fall. In effect, in this example, the CDS contracts make it possible to reduce risky debt to some combination of the lower bank risk weight and a small weight that applies to moving the risk outside of the bank sector – so there is little point in defining an ex-ante risk bucket of company bond as 100% risk weighted in the first place.

...expanding leverage

The simple transaction described above allows the banks to raise the leverage ratio from 12.5 to 53.8. The Basel risk weighting approach has allowed banks to expand their leverage almost without limit for all practical purposes. There are proposals try to deal with some aspects of the problem in relation to CDS contracts, by adjusting multipliers on exposures and on correlations between firms (see C.2).

Treating promises the same way, wherever they might sit

The financial system is a system of promises. A basic problem with the Basel system is that it cannot deliver a regulatory ideal of treating the same promises in the financial system in the same way wherever they are passed in the regulatory and tax arbitrage process. The same promises should be treated in the same way, regardless of where they sit in the financial system. In the above example this is problematic as shown in Table 2. Without further regulatory intervention the banks manage to reduce the overall capital in the banking system to \$18.6, instead of \$80, by passing the promise to a sector that lies beyond the banking regulator. The model multipliers can be adjusted somewhat so that counterparty risk is penalised by more – but a one-size-fits-all model adjustment will take no account of the actual situation of the re-insurer in another jurisdiction and which possibly holds insufficient capital. Bank A and B are not treated equally and the re-insurer is out of the picture.

Table 2. Promises treated differently

Promise Transformations	Bank A		Bank A	Bank B
	Bond Face Value	100% Cap Weight 8% Required K	20% Cap Weight 8% Required K	Regulatory adjustment 50% Off B/sheet Wt. 1.5% surcharge coef & 8% Req K.
Bank A Face value BBB bond	1000	80	16	2.6
Buy CDS on BBB bond from bank B				
Bank B Underwrites to Re-insurance \$50 prem.				
Total Banking Capital		80	16	2.6
Reinsurer		?	?	?

Source: Authors' calculations.

b) Bank, insurance companies and shadow banks

The issue of not treating promises equally is rife in the regulatory framework. Banks are regulated by bank regulators. Banks deal with insurance companies in various jurisdictions which are not regulated in the same way so financial promises can be shifted there. Some hedge funds issue securities in their own name and take deposits of investors and invest with leverage on behalf of investors – they act like capital-market-oriented banks. They are lightly regulated, but market discipline in the absence of implicit public guarantees gives rise to a higher cost of capital that corresponds to the risks being taken helping to keep the leverage ratio down to the 4 to 5 range. Banks on the other hand are highly regulated, and until now this has acted as some sort of guarantee that has allowed leverage of some bank institutions in the 30-75 range: even if the guarantee is not a formal one, the fact of being regulated acts as a 'stamp of approval' helping to reduce funding costs. It is from the regulated sector that the crisis arose. Going forward, if regulations on banks are

stepped up, there will be a corresponding shift in the amount and nature of business conducted in the shadow banking system. Where regulatory lines should be drawn is a very difficult subject on which to obtain a consensus – but one guiding principle is that similar promises should be treated in similar ways – wherever the promise sits.

c) Simple example on tax arbitrage⁷

Counterparty risk arising from the use of OTC derivatives was one of the key hallmarks of the crisis. Regulatory arbitrage and shifting promises was an important contributor to the explosion in CDS use. Tax arbitrage too allows promises to be transformed with strong implications for bank on- and off-balance sheet activity.

Consider two bonds, H at a 10% coupon and L at an 8% coupon. One investor is tax exempt while the other investor is subject to a 50% tax rate on bond H and a 25% tax rate on bond L. The non-taxable investor can buy bond H with the proceeds of shorting bond L and capture 2% of the face value traded, per year, with no initial investment. The taxable investor can buy bond L with the proceeds of shorting bond H and capture a 1% spread after-tax with no investment. Both traders gain as long as the taxable investor can utilise the tax deductions. Neither partner needs to know that the other even exists. Price disparities signal the opportunity. The combined profits realised by both trading partners, after-tax, come at the expense of a reduced government tax liability. These sorts of transaction using CDS complete market techniques give strong incentives to banks with investment banking arms to create structured notes that are very interesting to investors – giving rise to returns and risk profiles that they might not otherwise be able to achieve. Banks arbitrage tax parameters that are never closed by their actions, allowing additional (theoretically, unlimited) business and revenues – but at the same time risking a build-up of counterparty risk and leverage. Without a properly binding constraint on the ability of banks to expand leverage through capital arbitrage, the incentive to build attractive businesses on the basis of these incentives – continually expanding counterparty risks – may once again become excessive.

d) Summary

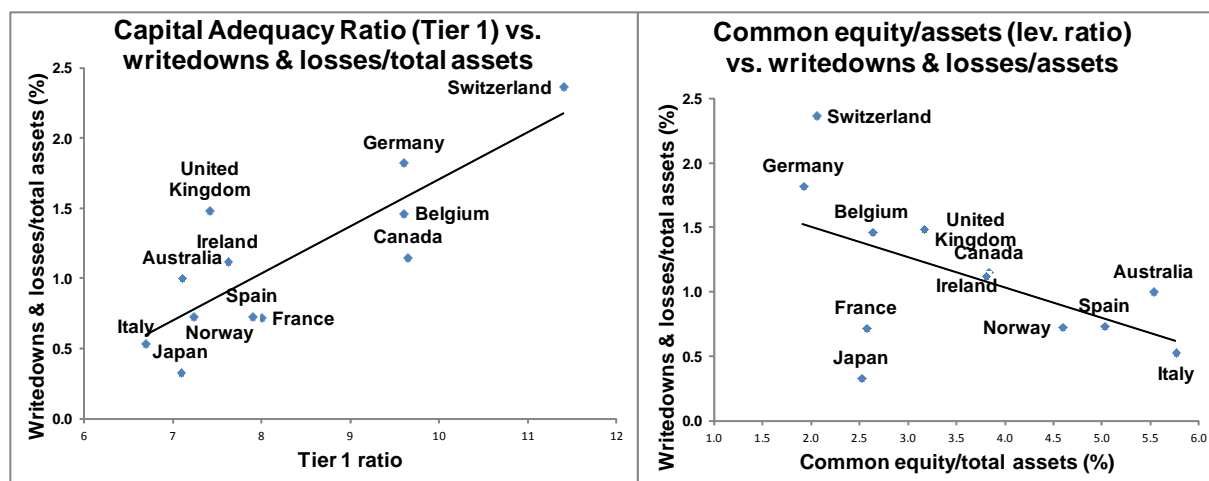
*Shifting promises
and perverse
outcomes*

The ability of banks to transform risk with complete markets in credit allows them to shift promises around according to their different regulatory and tax treatment, and basically avoid the proper intent of the Basel risk-weighting approach and thereby expand leverage in a relatively unchecked manner. This played a huge role in the recent crisis, as is illustrated in Figure 1. Basel risk weighting was associated with a perverse outcome in the crisis – the better the Tier 1 capital adequacy of banks of the jurisdictions shown in the left panel prior to the crisis, the greater were the cumulative losses of those banks during the crisis – in large part due to excess leverage. As the right panel shows, the raw leverage ratio has a negative relationship with losses in the crisis. Possible reasons for this are:

- Capital arbitrage under the Basel weighting of assets precisely permits higher leverage (economising on capital while expanding the balance sheet as shown in the above example) which is more risky.

- A low amount of capital versus the un-weighted balance sheet is symptomatic of a banking culture with a greater willingness to take on more risk with taxpayer's money – a culture of privatising gains and socialising losses.

Figure 1: Basel capital adequacy versus the simple leverage ratio



Note: Calculations based on the sample of banks reporting write-downs and credit losses as reported by Bloomberg, excluding US banks (where most conglomerate losses occurred in off-balance sheet vehicles to which Basel capital adequacy did not apply). Writedowns & losses are accumulated from January 2007 until mid-2009; Tier 1 ratios, total assets and common equity are averages of 2006-2008 end-of-year data (2007-2008 for Japan Tier 1 ratio).

Source: Bloomberg, Thomson Reuters Datastream, Worldscope, and OECD.

3. The required level of capital is not dealt with in the proposals

One issue of nuance when interpreting the report is the notion that government support was needed in the crisis due to the “insufficient quality” of capital rather than to the lack of it. While there have always been problems with quality, there simply was not enough quality capital. In some major institutions the losses incurred over the crisis period would have absorbed all or most of the capital that would correspond to the new focus on equity less goodwill (see Table 3).

How much capital is the key issue

Improvements in the definition of capital are welcome, but the amount of capital banks have is easily the most important issue in terms of conducting their intermediation activities with reduced risk of future crises. In the proposals there is no Basel Committee view on the level at which the leverage ratio should be set, nor on how it will interact with the capital weighting approach. This is a major concern. The issues are left to be determined in 2010, in part by discussions with the banks, across diverse jurisdictions with very different banking structures, and via quantitative impact studies involving those banks. This in itself is also concern. Regulatory capture is always a risk, and banks are known currently to be lobbying very hard. Banks did not have enough capital and will always opt for holding as little as possible to maximise the return on equity. The main issue in the reform process will be to set the leverage ratio at a level to ensure banks truly have enough capital – equally across all jurisdictions. The leverage ratio should not be thought of as a “backstop” measure, given how ineffective the capital weighting approach has been.

The leverage ratio is no “backstop”

Table 3. Common equity & retained earnings in 2007 versus subsequent losses

US Banks	Assets	Equity less Goodwill	Writedown&Loss	Leverage (Ass/(equ-goodwill))
	Q2 2007, USD billions	Q2 2007, USD billions	Q1 2010, USD billions	Ratio
JPMORGAN CHASE	1,458	74	63	20
CITIGROUP	2,221	88	124	25
BANK OF AMERICA	1,534	67	89	23
WELLS FARGO	540	35	43	16
GOLDMAN SACHS	939	32	9	29
MORGAN STANLEY	1,200	35	23	34
LEHMAN BROTHERS	606	16	16	37
MERRILL LYNCH	1,076	34	56	32
WACHOVIA	720	31	102	24
BEAR STEARNS	423	NA	3	NA

European Banks	Assets	Equity less Goodwill	Writedown&Loss	Leverage (Ass/(equ-goodwill))
	Q4 2006, USD billion	Q4 2006, USD billion	Q1 2010, USD billions	Ratio
UBS	1,961	31	58	64
ROYAL BANK OF SCOTLAND	1,709	44	52	39
HSBC	1,862	75	50	25
BARCLAYS	1,953	27	35	73
HBOS	1,159	36	29	32
DEUTSCHE BANK	1,478	34	22	44
CREDIT SUISSE	1,025	27	21	38
SOCIETE GENERAL	1,259	32	20	40
BNP PARIBAS	1,895	52	20	37
BANCO SANTANDER	1,086	40	13	27

Source: Bloomberg, Thomson Reuters Datastream, Worldscope, and OECD.

4. Risk weighting and leverage ratio approaches may not sit well together

Part of the reason for this is that the risk weighting approach and the leverage ratio do not sit easily together. Capital as defined by the risk weighting approach might give rise to a capital level as in:

$$\text{Min.CAP(RWA)} = 0.08 * \{12.5(\text{OR} + \text{MR}) + \text{SUM}[w(i)A(i)]\} \quad (2)$$

But capital according to a leverage ratio is defined as:

$$\text{Min CAP(LR)} = \beta \text{SUM}[A(i)] \quad (3)$$

Whatever the level that is set for β , it is the leverage ratio that is likely to be the binding constraint.

$$\text{Min.CAP(RWA)} \leq \text{Min.CAP(LR)} \quad (4)$$

If the leverage ratio is set too low it will become a maximum capital ratio

This is because, as the above discussion demonstrates, banks' ability to arbitrage the capital weights to reduce capital and expand leverage is very extensive. If the leverage ratio is set too high (capital required too low), banks will have an incentive to arbitrage the weights to ensure they do not hold any more capital than needed. This is a cost minimization exercise for banks that will see regulators effectively setting maximum rather than minimum capital ratios in

Pillar 1. This process will likely be very distortionary, as it has been in the past, pushing banks towards lower weighted assets and shifting promises outside the banking system – with the risks of creating new bubbles and/or unintended shadow banking developments via the regulatory arbitrage process.

5. *The need to penalise regulatory arbitrage in Pillar 1*

Penalise deviations from a benchmark asset allocation

Based on the above discussion there is a need to penalise regulatory arbitrage and the concentrations to which it gives rise in Pillar 1. Basic capital adequacy can be dealt via a leverage ratio for on and off-balance sheet items (equally weighted). Relative risk and concentration issues could be dealt with by setting an ‘appropriate diversification’ portfolio benchmark allocation with generous ranges, allowing banks ample flexibility in their business decisions, but applying a quadratic minimum capital penalty for deviations from the benchmark. At the benchmark required capital would be the leverage ratio requirement, but the quadratic rule would penalise deviations, requiring increasingly more capital the greater the deviation. This would have the following advantages:

- Ensuring that all banks have a minimum amount of capital, equal and transparent between countries.
- More scope for bank management to do their job without heavy regulatory costs.
- Less onerous modelling requirements.
- Avoiding concentration stemming from the Basel model framework, and the incentives for regulatory and tax arbitrage.
- Reduce the shifting of promises to less regulated sectors.

Such a concentration capital penalty in Pillar 1 would be in addition to any extra capital requirements implied by the pro-cyclical/capital buffer Basel III proposals.

E. **Liquidity Proposals**

1. *The Liquidity Coverage Ratio*

This proposal focuses on asset liquidity to ensure banks always have a 30-day liquidity cover for emergency situations. The Basel Committee is proposing a Liquidity Coverage Ratio (LCR) defined as:

$$\text{LCR} = (\text{High Quality Assets}) / (\text{30 Day Net cash Outflows}) \geq 100\% \quad (5)$$

where the value of assets and the outflows refer to those that would arise with a major financial shock, a deposit run off and a 3-notch downgrade in the credit rating. High quality assets can include things with a low correlation to risky assets, listed in active stable markets, with market makers and low concentration of buyers and sellers; *i.e.* easily convertible to cash in stressed markets (e.g. cash, central bank reserves, marketable claims on sovereigns, central banks, the BIS, IMF etc., and government debt issued in the currency of the country of operation).

Corporate and covered bonds may be eligible – after a quantitative impact study – with an appropriate haircut. Cash outflows will be based on the modelling of funding run-offs: stable and less stable deposits; unsecured wholesale funding; and secured (collateralised) funding run off. Further clarifications are:

- Derivatives pose a problem, as downgrades require collateral to be posted – *i.e.* additional liquidity requirements. The Basel Committee proposes that if collateral in the form of cash or high-quality debt is already posted, then no additional LCR is required. But if other collateral is used, a 20% collateral surcharge will apply.
- For structured products: 100% of maturing debt paper and/or 100% of the \$ amount of assets that could be returned due to embedded options that allow for the return of assets to the entity are required in the LCR.
- For credit facilities extended, banks will need to hold 10% of the drawdown in the shock scenario for retail and non-financial corporate customers.
- For liquidity facilities to non-financial corporate 100% of the amount is required, and similarly for other entities like banks, securities firms, insurance companies, SPV's, sovereigns, central banks etc.

On the cash inflow side, supervisors and banks need to ensure no concentration or dependence on a few sources, and on fully performing assets. No credit facilities extended to the bank can be included as inflow.

2. *The Net Stable Funding Ratio*

To ensure stable funding over a 1-year horizon The Basel Committee is proposing that the liquidity characteristics of banks' asset and liability matching structure be controlled through the Net Stable Funding Ratio (NSFR):

$$\text{NSFR} = (\text{Available Stable Funding } \$) / (\text{Required Stable Funding}) \geq 100\% \quad (6)$$

- Available Stable Funding is defined as: Tier 1 and Tier 2 capital (100%) + preferred stock not in Tier 2 with maturity ≥ 1 year (100%) + liabilities ≥ 1 year (100%) + stable shorter-term retail & small business funding (with $\leq \text{€}1\text{m}$ per customer) (85%) + less stable (e.g. uninsured non-maturity) retail & small business funding (70%) + unsecured wholesale funding (50%). Central bank discounting is excluded to avoid over reliance on central banks.
- The Required Stable Funding (RSF) is based on balance-sheet and off-balance-sheet exposures, and is defined as: Cash, securities ≤ 1 year, loans to financial firms ≤ 1 year (0%) + unencumbered marketable sovereign, central bank, BIS, IMF etc AA or higher with a 0% risk weight (20%) + Gold, listed equities, corporate bonds AA- to A- ≥ 1 year, loans to non-financial corporate ≤ 1 year (50%) + loans to retail clients (85%) + all else (100%). Off-balance-sheet exposures to be included are conditionally revocable & irrevocable credit facilities to persons, firms, SPV's and public sector entities: a 10% RSF of the currently undrawn

portion. All other obligations will have an RSF set by the national supervisor.

3. *Other monitoring*

The Basel Committee is also proposing to monitor key variables of concern requiring disclosure to supervisors:

- Contractual maturity mismatch on all on- and off-balance-sheet flows mapped to various time frames – daily, weekly, monthly, etc. Banks have to explain how any mismatches are going to be bridged.
- Concentration of funding over different time horizons:
 - (a) (Funding liability from significant counterparties)/(Balance sheet total)
 - (b) (Funding liability from each significant product)/(Balance sheet total)
 - (c) List of assets and liabilities by significant currency.

A significant counterparty, product or currency means $\geq 1\%$ of the banks total liabilities. These will provide a basis for discussion with supervisors and possible action.
- Available unencumbered assets which are marketable as collateral in secondary markets and/or are eligible for central bank standing facilities will need to be disclosed by significant currency.

4. *Problems with the liquidity proposals*

Confusion about cause and effect

The liquidity proposals have some puzzling features. If banks are solvent, and have adequate capital, then the management of their liquidity and funding should in principle be left up to them. Maturity transformation is a key function of the banking system, and notwithstanding the crisis banks should not be treated as being naïve in running their own businesses. The cause of the crisis was a solvency problem, after which uncertainty rose as to banks' ability to pay which, in turn, led to a buyers strike affecting short-dated funding. While the solvency crisis and the resulting liquidity problems were historically extreme, the central banks were still able to play their role in alleviating pressures.

The starting point for a liquidity framework is the role of the central bank in ensuring the stability and functioning of the payments system. The approach suggested in the report is to mimic the capital standards approach by defining an asset/liability class, assigning arbitrary weights, cumulating and constructing ratio constraints. Even at first glance one can see the potential for problems:

A bias towards government bonds? Now?

- The LCR has a bias towards government bonds. While budget deficits are large, and it may be handy from the viewpoint of interest rate risk to have captured buyers, this process will work against lending to the private sector – and particularly to SME's.
- Furthermore, in some jurisdictions, sovereign bonds are highly risky and even potentially subject to default risk not captured consistently by rating agencies. A one-size-fits-all set of controls could, in extreme

circumstances, see a liquidity rule actually contributing to solvency issues for banks.

Could it encourage more risk taking?

- The NSFR is a poor measure, because it depends upon the ability of firms and supervisors to be able to model investor behaviour which is “stable” or “unstable” in a crisis situation.
- The liquidity proposals require more ‘liquid’ assets to be held which, other things given may lower returns. This may increase the incentive for excess risk taking in other areas.

These issues of managing liquidity are best left to the market, with supervisors focusing on solvency issues and resolution regimes to deal efficiently with insolvency when it arises. The role of capital adequacy is to lend confidence to market participants that losses can be absorbed. Even in the case of Northern Rock, the liquidity problems began to mount when uncertainty about capital adequacy began to rise.

F. Concluding Remarks

In previous studies the OECD has identified the main hallmarks of the crisis as:⁸

- Too-big-to-fail institutions that took on too much risk – a large part of these risks being driven by new innovations that took advantage of regulatory and tax arbitrage with no effective constraints on leverage.
- Insolvency resulting from contagion and counterparty risk, driven mainly by the capital market (as opposed to traditional credit market) activities of banks, and giving rise to the need for massive taxpayer support and guarantees. Banks simply did not have enough capital.
- The lack of regulatory and supervisory integration, which allowed promises in the financial system to be transformed with derivatives and passed out to the less regulated and capitalised industries outside of banking – such as insurance and re-insurance. The same promises in the financial system were not treated equally.
- The lack of efficient resolution regimes to remove insolvent firms from the system. This issue, of course, is not independent of the structure of firms which might be too-big-to-fail. Switzerland, for example, might have great difficulty resolving a UBS or a Credit Suisse – given their size relative to the economy. They may have less trouble resolving a failed legally separated subsidiary.

How do the Basel III proposals bear on these issues, in the sense of helping to ensure that the chance of another crisis like the current one can be greatly reduced? The Basel III capital proposals have some very useful elements – notably the support for a leverage ratio, a capital buffer and the proposal to deal with procyclicality through dynamic provisioning based on expected losses. Adopting the buffer capital proposal to ensure the leverage ratio was not compromised in crisis

situations seems especially important – so that in good times, dividends, share buyback policies and bonuses would be restrained as necessary to build back buffers used up in bad times – seems very important.

These can easily be incorporated with other reforms.

However this report also identifies some major concerns.

- Basel III does not deal with the most fundamental regulatory problem identified: that the ‘promises’ that make up any financial system are not treated equally – in particular banks can shift them around by transforming risk buckets with derivatives (particularly CDS) to minimise their capital costs – including shifting them beyond the jurisdiction of bank regulators – e.g. to the insurance sector in a least regulated jurisdiction. The extent of activities in the shadow banking system also a part of the problem related to how similar promises are treated by regulators. This issue has many implications for the reform process.
- For example, it is a powerful argument for making the leverage ratio the primary capital control tool (not a ‘backstop’). There is a risk that setting the leverage ratio too low, if combined with the RWA approach, that regulators will be setting maximum capital requirements and cause portfolio distortions, as capital arbitrage and risk-bucket transformation operates to ensure that Basel III does not cause banks to hold more capital than the ‘maximum’.
- Treating promises differently also has implications for how to think about reform of the structure of the supervision and regulation process. For example, would it not be better to have a single regulator for the whole financial system – and global coordination in this respect – to ensure that it is much more difficult to shift promises?
- Treating promises differently will also require more substantial thinking about the shadow banking system: whether it should be incorporated into the regulatory framework and, if so, how.
- Finally, the flaws identified in the overall RWA framework that make it difficult to deal with concentration issues in Pillar 1, suggest that other framework modifications should be considered. For example, a quadratic rule applied to deviations from a diversified benchmark portfolio is a feasible way to deal with the issue.

Notes

- ¹ A third tier of capital is defined in the *Market Risk Amendment* to the original accord.
- ² Gordy (2003), page 222.
- ³ Kane (2006) points out that the whole process of negotiating Basel II in the US has been made especially difficult due to disagreements between complex financial institutions and the various regulatory groups. In this process, the banks are always going to seek the least burdensome system where any choice is involved.
- ⁴ A previous very senior member of the Basel Committee mentioned several times in discussions that banks are very effective at driving their agenda and influencing outcomes.
- ⁵ One small concern here is that in developing countries the need to deduct profitable foreign JV partner net income may lead to preferences for organic growth and reduce international capital flow and technology transfer.
- ⁶ This makes some sense for banks likely to get into trouble, although it is clearly discriminatory against banks that are well run with reliable future income.
- ⁷ This subsection benefits from discussions with Sam Eddins, Ironbridge Capital, with whom one of the current authors is working to produce a paper on likely future developments in the financial system.
- ⁸ See, for example, OECD (2009), Adrian Blundell-Wignall *et al.* (2009).

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