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Origins of the financial crisis and requirements for reform

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ABSTRACT

This paper examines the causes of the global financial crisis (focusing in particular on why residential mortgage-backed securities and credit default swaps exploded from around 2004) and the policy reform agenda. Arbitrage opportunities in capital rules and the tax system were available, and changes in regulations affecting the leverage of international banks (IBs) played a key role in allowing these opportunities to be exploited on a greater scale. Changes to the Basel rules also actively contributed to the sharp rise in toxic securities. The policy agenda focuses on the need to deal with toxic assets, and for broader reforms to incentive structures, not only of capital rules, but also of corporate governance and banking structures. Specific policy reform recommendations are made. Recent numbers on the capital needs of banks suggest that we are not very far into the process of dealing with the crisis, and lack of transparency in this respect is a major issue in Europe. The longer-run reform process too is not focusing on the ideal building blocks.

1. Introduction

At the July 2008 Reserve Bank of Australia conference on the current financial turmoil the paper by Adrian Blundell-Wignall and Paul Atkinson explained the current financial crisis as being caused at two levels: by global macro liquidity policies and by a very poor framework for incentives of financial sector agents, conditioned by bad regulations, tax systems and governance standards. Far from acting as a second line of defense to excess liquidity, policies at this level actually contributed to the crisis in important ways.[1] The liquidity policies were like a dam overfilled with flooding water. Global liquidity distortions, including interest rates at 1% in the United States and 0% in Japan, China's fixed exchange rate and recycling of its international reserves, and the Sovereign Wealth Funds (SWF) investments, all helped to fill the dam to overflowing. That is how the asset bubbles and excess leverage got under way.

However, the main focus of this paper is with the second set of issues. The faults in the *wall of the dam*—the regulatory, tax and governance incentives—started to direct the water more forcefully from about 2004 into some very specific areas: mortgage securitization, including synthetic (derivative-based) bonds, strong off-balance sheet activity and the use of tax havens. The pressure became so great that that the dam finally broke, and the damage has already been enormous.

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[1] See Blundell-Wignall and Atkinson (2008).

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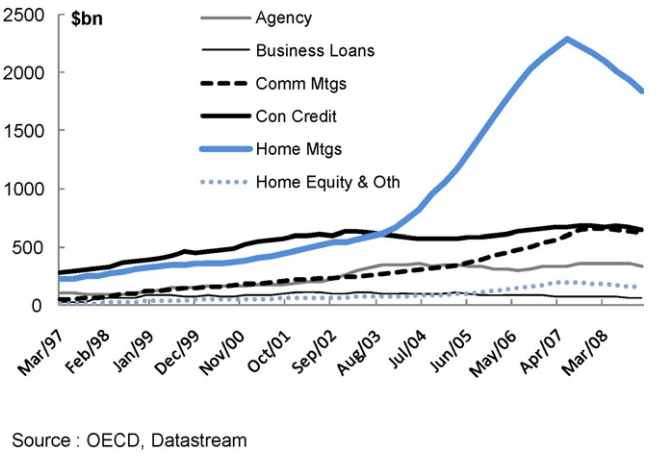

Fig. 1. ABS issuers, home mortgages and other loans. *Source*: OECD, Datastream.

Many papers analyzing the causes of the crisis focus on behavior within the financial sector, such as irrational behavior and non-profit maximizing incentives (Akerlof & Shiller, 2009) and lack of transparency of new and complex products and the ability of banks to manage and their exposures with their complex value at risk models (Jenkinson, Penalver, & Vause, 2008; Haldane, 2009). Others have focused on compensation schemes in the financial sector that encouraged excess risk taking (Blinder, 2009). One focused on poor underwriting standards and lack of regulation of mortgage brokers (Gramlich, 2007). Still others have focused on the greater interconnectedness of risk taking between institutions and markets, making it more exposed to systemic risk (Rajan, 2005). Some groups have focused on the role of credit rating agencies (CRAs) that play a key role in providing inputs to risk models, arguing that they improperly managed conflicts of interest (e.g. SEC, 2008a, 2008b).

However, many of these conditioning factors in the crisis have been around for a very long time—irrational behavior, greed, poor underwriting standards, poor risk models, globalization, and complex products—and do not explain the very sudden avalanche of activity in bank securitization and the use of credit default swaps (CDS) from 2004. Focus on symptoms of the crisis distracts attention from the pivotal role of policy making in causing the crisis—i.e. in creating distorted incentives and then permitting a massive expansion of leverage enabling the private sector to take full advantage of them. Regulators and supervisors collectively failed on a massive scale to achieve even mildly risk-averse outcomes. There is also a certain lack of accountability amongst policy makers that does not encourage optimism about the reforming the policy process itself.[2]

When economists talk about causality they usually have some notion of exogeneity in mind; that relatively independent factors changed and caused endogenous things to happen—in this case the biggest financial crisis since the Great Depression. Fig. 1 shows the veritable explosion in residential mortgage-backed securities (RMBS) after 2004. This class of assets was in the vortex of the crisis, and any theory of causality must explain why it happened then and not at some other time.

Many of the above-mentioned factors identified for reforms, were not causal in the above sense. This would require that these factors were subject to independent behavioral changes. CRA practices did not change in 2004. Nor did banks switch to inferior risk models in that year, or mandate weaker underwriting standards, and so forth. Reform in these areas is of course welcome—they are conditioning factors that are worth serious attention. But if the more fundamental (causal) factors are not addressed, then agents in the financial sector will find new ways to exploit them in the future.

This paper argues that four aspects of policy played the most important roles in causing the crisis: (i) capital rules and tax wedges set up clear arbitrage opportunities for financial firms over an extended period—these were policy parameters that could not be competed away as they were exploited. Instead they could be levered indefinitely until the whole system collapsed; (ii) regulatory change permitted leverage to accelerate explosively from 2004; (iii) systemically important firms were permitted to emerge and barriers to contagion risk within them were explicitly broken down as a new business model in banking with an equity culture emerged; and (iv) cumbersome regulatory structures with a poor allocation of responsibilities to oversee new activities in the financial sector were in place.

2. Arbitrage opportunities: capital rules and tax

Businesses, banks, investors and their agents are supposed to act according to the *hidden hand* of Adam Smith—the micro players act individually in their own self interest and desirable outcomes emerge that enhance the wealth of nations. But

[2] The defensiveness of policy makers in most international organisation meetings is readily observable. Few senior policy makers have felt any need to resign. At the RBA conference, one supervisor was arguing that much more accountability (job tenure and remuneration) was required in the private sector, but he was astounded at the suggestion that the same accountability should also be applied to regulators and supervisors who collectively failed on a massive scale to achieve even mildly risk-averse outcomes.

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these micro players within the banking sector found themselves interacting with a set of distorted financial and tax regulations, shifts in the technology platform and product innovations, all of which combined to allow arbitrage opportunities to be exploited in new ways. Not only did this self interest not come across any of the binding constraints that policy making and regulations are supposed to provide, but the regulations were also changed in favour of the banks through a process that can be loosely termed '*regulatory capture*'.

If the trade-off between risk and reward in the financial system shifts towards imprudence in this way, then systemic problems arise in ways that do not apply to other sectors. Banks are special: they are interrelated with the economy and with each other, and the collapse of the few can bring down the whole system. Adam Smith understood this 225 years ago, but policy makers whose '*watch*' it was prior to this crisis did not:

> "*To restrain private people, it may be said, from receiving in payment the promissory notes of a banker, for any sum whether great or small, when they themselves are willing to receive them, or to restrain a banker from issuing such notes, when all his neighbours are willing to accept of them, is a manifest violation of that natural liberty which it is the proper business of law not to infringe, but to support. Such regulations may, no doubt, be considered as in some respects a violation of natural liberty. But those exertions of the natural liberty of a few individuals, which might endanger the security of the whole society, are, and ought to be, restrained by the laws of all governments, of the most free as well as of the most despotical. The obligation of building party walls, in order to prevent the communication of fire, is a violation of natural liberty exactly of the same kind with the regulations of the banking trade which are here proposed.*" [Adam Smith, An Inquiry into the Nature and Causes of the Wealth of Nations, Book II, Chapter ii.]

2.1. Capital arbitrage under Basels I and II

Basel I risk weights favoured claims on government, regulated banks and securities firms and residential real estate with low minimum capital requirements.[3] This effectively provided regulatory subsidies to the cost of capital for mortgage lending, especially when funded through the wholesale markets, and securitization activities. It is not clear how the revised Basel II framework (which allows capital requirements to be based on banks' own risk modeling, the internal ratings based (IRB) approach, or external ratings analysis of current and historical market prices and default performance) will affect relative minimum capital requirements, given the recent volatility in prices and the damage to credit ratings in many areas.[4]

What is clear, however, is that when Basel II was published in 2004 market volatility and the perception of risk was low. The capital weight given to mortgages was to fall from 50% to 35% under the simplified Basel II, and to as little as 15–20% (depending on the bank) under the sophisticated internal ratings based (IRB) version. A lower capital weight raises the return on capital for a given mortgage asset, and the corollary of this is that greater concentration in low-capital-weighted mortgages improves the overall bank return.

One of the '*gob-smacking*' assumptions of basic capital regulation under the Basel system is something called "portfolio invariance". In simple terms that means the riskiness of an asset like a mortgage is independent of how much of the asset you add to the portfolio. Banks appear to have believed in this just as much as their supervisors, given the way they responded to the arbitrage opportunity that arose in the transition from Basels I to II. If mortgage securitization could be accelerated and pushed into off-balance sheet vehicles,[5] banks could raise the return on capital right away (from 2004) without waiting for the new regime. It would be quite rational to do this to the point where the proportion of on balance sheet mortgages (with a 50% capital weight) and off-balance sheet mortgages (with a zero capital weight) equated the (higher) return likely to emerge for a Basel II mortgage (where capital weightings would apply regardless of whether assets were on or off the balance sheet).

2.1.1. The Citigroup example

Citigroup was a good example of this. There was strong lobbying to adopt Basel II as soon as possible.[6] Citigroup opted to the internal ratings based (IRB) Basel II option, where FDIC data on the Quantitative Impact Study number 4 (QIS4) showed that such banks expected the capital weight on mortgages to fall by 2/3, say from 50% under Basel I to 15–20% under Basel II.[7] With securitized off-balance-sheet mortgages not attracting a capital charge under Basel I, this presented a straightforward arbitrage: what percentage of on and off-balance-sheet mortgages would allow the increased return on capital for mortgages now (from 2004) without causing a shortage of capital later on when Basel II became fully operational? The Basel I anticipating Basel II 20% mortgage weight would be the following simple arbitrage:

$$0.4 \times (50\%\,\text{on-B/sheet cap/weight}) + 6\% \times (0\%\,\text{off-B/sheet weight}) = 20\%\,\text{Basel II equivalent weight}$$

[3] Claims on regulated banks and securities firms in OECD countries carried "risk-weights" of 20%, effectively exonerating 80% of such claims from capital backing. Residential mortgages carried a risk-weight of 50%. All other claims on the private sector were 100% risk-weighted.

[4] See Blundell-Wignall and Atkinson (2008).

[5] See Blundell-Wignall (2007).

[6] For an example of Basel II lobbying, see the letter by Davis C. Bushnell, senior risk officer of Citigroup to the Federal Reserve, FDIC, Comptroller of the Currency and Office of Thrift Supervision as late as the 17th of March 2007, just before the crisis, arguing against leverage ratios requiring more capital and strongly supporting the push to Basel II.

[7] See FDIC (2005).

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At the end of 2007 Citigroup 10K filings show $313.5 bn on balance sheet mortgages and $510.5 bn Variable Interest Entities (VIEs) and retained interests in Qualifying Special Purpose Entities (QSPEs). That is, about 38% on balance sheet and 62% (consisting of VIEs and QSPEs that Citigroup is responsible for) off its balance sheet. But that is not all. Citigroup had a further $733.7 bn in QSPEs, where the interests had been transferred away from Citigroup. That is to say, Citigroup was able to grow earnings via fees, and transfer all of the risk (i.e. so no capital is required) to other banks, individuals, hedge funds, insurance companies and pensions funds at home and abroad.

2.1.2. The Northern Rock example

Liquidity problems, whereby bank liabilities were not matched to the duration of their assets as they grew mortgage products with Basel II anticipation in mind is well illustrated by Northern Rock in the UK. Mortgages products had been made so attractive by IRB adherence to Basel II, that there was an incentive to grow them more quickly than could be funded by deposits. Northern Rock grew assets at a rate of over 25% per annum in the few years preceding the collapse funded by borrowing heavily in wholesale markets and concentrating assets in mortgage products (75% of assets) which would reduce their capital requirement as their Basel II application came into force. When an 'equity culture' is mixed in with 'credit culture', the attraction for management was to have an expanded business with more profitable mortgage products driving the expansion of earnings and the share price; or they could return excess capital to shareholders, with an equally beneficial impact on the share price.

Here is the response of the Northern Rock CEO in the UK Treasury Committee Evidence[8]:

- Mr Fallon: "Mr Applegarth, why was it decided a month after the first profit warning, as late as the end of July, to increase the dividend at the expense of the balance sheet?".
- Mr Applegarth: "Because we had just completed our Basel II two and a half year process and under that, and in consultation with the FSA, it meant that we had surplus capital and therefore that could be repatriated to shareholders through increasing the dividend."

By June 2007, just as the crisis was due to break out, Northern Rock had total assets of GBP113 billion and shareholder's equity of GBP2.2 billion. Their Risk Weighted Assets (RWA) under Basel II were a mere GBP19 billion (16.7% of total assets), compared to GBP34 billion under Basel I (30% of assets). Under Basel II they had Tier 1 capital of a 'healthy' 11.3% of RWA, but only 2% of total assets. When the crisis started, and liquidity dried up, Northern Rock suffered the first run on a British bank since 1866, and their regulatory capital was less than 10% of the GBP23 billion that the authorities used to support it.

2.1.3. The Hypo Real Estate example

Hypo Real Estate collapsed in 2009. They had Tier 1 capital of 5.51 billion Euros, and un-weighted assets of 400.2 billion Euros at the end of 2007, just after they purchased the securities subsidiary DEPFA—in short, regulators permitted a leverage ratio of 72.6. Risk-weighted assets were a mere 101 billion Euros, making the Tier 1 regulatory only 18.3, in part due to the financial engineering with derivatives at DEPFA. This firm specializes in Collateralized Synthetic Obligations (CSOs) and avoiding regulatory capital is almost always the reason for these transactions. Here is what DEPFA Bank said of a major CSO transaction as recently as December 2007, just as the crisis that would destroy its parent was well under way:

> "*Since October 2007, DEPFA has been a member of the Hypo Real Estate Group, and this transaction achieves a number of objectives for DEPFA, and the Group as a whole: DEPFA has reduced the amount of regulatory capital required to support the assets (which under current BIS rules are 100% risk weighted, though under Basel II this will reduce substantially), and at the same time has improved the return on equity and credit risk*".[9]

The bank was proud to be avoiding capital and doing another deal. Government guarantees and loans to April 2009 to aid the ailing bank have been 100 bn Euros, and now the whole group is being nationalized.

2.2. Tax arbitrage and synthetic bonds

Complex tax systems within and between countries have and always will lead to arbitrage opportunities that can't be competed away.[10] Tax arbitrage contributed to the explosive growth of profits based on securitization. There are three basic steps in the argument: regulatory change allowing mortgage conduits; use of tax havens for structuring special purpose vehicles (SPVs) based on low quality mortgages; and the use of CDS contracts to switch tax losses on the capital of low quality mortgages from final buy and hold investors (who could not use them efficiently) to traders (who could):

- *Regulatory change for mortgage securitization*: the 1986 Tax Act created Real Estate Mortgage Investment Conduits (REMICs) as vehicles which are not themselves subject to tax but pass the tax liabilities through to investors. It shifts the basis for

[8] See House of Commons Treasury Committee (2008).

[9] DEPFA Bank, Archive 2007 Press-/Ad-Hoc Publications. DEPFA closes third EPIC CLO. The basic mechanism is this: by purchasing CDS protection on its assets, which remain on its balance sheet, it transfers the credit risk to someone else, and this is recognized in its Basel Risk-weighted assets. This is fine as long as counterparties don't fail, and the contracts can be renewed if they are of shorter duration than the assets. None of these things tend to apply in a global financial crisis.

[10] Since tax rates are set by the authorities as parameters.

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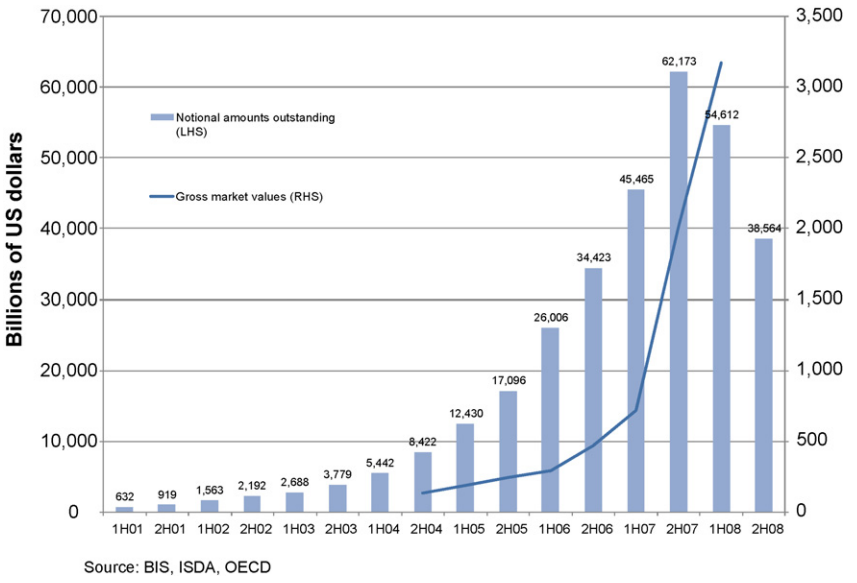

Fig. 2. Notional outstanding CDS and settlement values. *Source*: BIS, ISDA, OECD.

taxation from the principal and interest received by the REMIC to the form in which it is paid to investors. This often involves conversion of interest to principal, creating tax benefits for many recipients. These tax benefits rise with the degree of credit risk of the underlying assets, since the larger the risk premium incorporated in interest rates, the greater the tax benefit arising from paying it out as principal.

- *Use of tax havens for SPVs and collateralized debt obligations (CDOs)*: restrictions on credit quality applied to the underwriting standards of mortgages that could be securitized in the United States are fairly high. By using SPVs in tax havens these restrictions could be avoided and the (higher) tax benefits of securitizing lower quality mortgages could be obtained. Since certain tax havens levy no business income tax, CDOs can be structured there as limited liability companies without incurring any tax liabilities at the level of the SPV. For mortgage investors this replicated the tax benefits of REMICS across a wider (in quality) range of mortgages, while also permitting opacity in the treatment of income and capital. For example, if a $100 investment in residential mortgage-backed securities (RMBS) based on subprime had a 20% yield, but lost 15% of its value due to defaults, at the end of the year, $5 income could be declared to the tax authority, the broker could use the losses as a deduction, and the investor could get a high yield insured (with CDS) return
- *The explosive growth of CDS contracts:* a tax arbitrage opportunity is created any time different flows of income or expenditure are subjected to differing tax treatment due to variations in the tax rates or other aspects of tax situations that different recipients and payees face. Samuel Eddins[11] has associated the curiously high level of activity in the market for CDSs with the conversion of interest to principal for tax purposes noted above (see Fig. 2).

Eddins argues that an arbitrage incentive is created by tax treatment of interest and credit default losses that is symmetric for financial institutions while many taxable "buy and hold" investors face higher taxes on their interest income than they can recover in the event of losses. This means that insurance against default is worth more to the buy and hold investor than to the financial institution selling the insurance. The price of the insurance determines how the difference is shared between the buyer and seller, and Eddins believes that the market for such insurance was so large that the financial institutions writing the swaps were able typically to get most of the benefit. And since the derivatives contracts allow the credit risk to be separated from the time value of money component of the contractual interest rate on the security itself, the CDS is a very efficient instrument as it requires essentially no capital since there is no need to pay for the underlying security. In effect, this is an infinite rate of return to the trader.

3. 2004: regulation and the leverage explosion

In 2004 four time-specific factors came into play that combined to cause explosive growth in leverage (with a concentration in mortgage-related products and taking strong advantage of all of the above arbitrage opportunities: (1) the Bush Administration American Dream zero equity mortgage proposals were signed into law and became operative, helping low-income families to obtain mortgages; (2) the then regulator of Fannie Mae and Freddie Mac, the Office of Federal Housing Enterprise Oversight (OFHEO), imposed greater capital requirements and balance sheet controls on those two

[11] See Eddins (2009).

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Table 1
US and European bank leverage ratios.

Year	US commercial banks	US investment banks	European banks
2002	17.0	24.9	na
2003	17.9	24.0	na
2004	17.1	26.8	na
2005	16.8	28.0	na
2006	16.5	27.8	na
2007	18.9	33.8	33.5

Source: Company Reports.

government-sponsored mortgage securitization monoliths, opening the way for banks to move in on their "patch" with plenty of low-income mortgages coming on stream; (3) the Basel II accord on international bank regulation was published and opened an arbitrage opportunity for banks that caused them to accelerate off-balance-sheet activity; and (4) the SEC agreed to allow IBs voluntarily to benefit from regulation changes to manage their risk using capital calculations under the 'consolidated supervised entities program'.

Low interest rates and social policies (like 'American Dream') were important factors in the housing boom, providing the basic raw material of low quality mortgages as inputs to the securitization process. The demand for these products came from the SPVs, created by banks taking advantage of the Basel and tax arbitrage processes discussed above. This could have been contained with restraints on leverage; but in 2004 policy makers went in the opposite direction.

Prior to 2004 the SEC was responsible for broker-dealer subsidiaries of IBs, where stringent rules (permitting a maximum 15:1 debt to equity ratio) applied, but no provision was made for compulsory consolidated supervision of IBs, even if they had banking affiliates.[12] This posed a problem for internationally active securities firms since operating in Europe required consolidated supervision to comply with the EUs Financial Conglomerate Directive.

To deal with this situation the SEC adopted a purely voluntary "Consolidated Supervised Entities" (CSE) programme in 2004. This was recognized by the Financial Services Authority (FSA) in the United Kingdom as "equivalent" to other internationally recognized supervisors, providing supervision similar, although hardly identical, to Federal Reserve oversight of bank holding companies. It proved to be inadequate.[13] Furthermore, even if the SEC had been well-equipped to carry out supervisory responsibilities beyond the activities of broker-dealer subsidiaries, the scope for different approaches to enforcement noted by the General Accounting Office (GAO) would have remained as a potential distortion to competition.[14]

These new arrangements permitted a sharp rise in the leverage ratio of US IBs towards 40:1 in some cases. Table 1 shows the impact of this change on the leverage in US IBs. Leverage ratios rose rapidly towards levels applying in European banks, and US commercial banks that owned IBs saw their leverage ratio rise in proportion. This quantum shift in leverage was a great enabling factor for banks to take advantage of the arbitrage possibilities in capital and tax regulation. From 2004, as shown earlier, there was a material acceleration in off-balance sheet mortgage securitization and the use of derivatives (particularly CDS) to create synthetic bonds as key avenues to drive the revenue and the share price of banks.

With respect to the constraints imposed on Fannie and Freddie, the key moving part is that banks had been selling mortgages to them, and would face revenue gaps and an interruption to their earnings growth if they could not continue to do so. So they had the incentive to accelerate their own Fannie and Freddie look-alikes: the structured investment vehicles (SIVs) and collateralized debt obligation (CDOs), and were able to do with the reduced constraints on leverage. The pattern of controls affecting Federal Mortgage Pools versus private label RMBS is shown in Fig. 3. This new surge of pressure caused by the Fannie-Freddie regulator was picked up much too late by Bank regulators to take effective action.

3.1. The aggregate results on the sudden acceleration of subprime leverage

In the Reserve Bank conference paper RMBS was modeled with GDP, the mortgage rate, the mortgage spread to Fed Funds, 12-month (OFHEO) house price inflation, aggregate excess bank capital under Basel, and an allowance for the impact of the S&L crisis at the end of the 1980s. With these standard variables the model worked well for sample periods prior to 2004, but

[12] For IBs with no US banking affiliate the law does provide for voluntary supervision of the holding company. Only Lazard Ltd opted for this arrangement. The five (former) major IBs all had some US banking affiliates and hence were uncovered until the Consolidated Supervised Entity program described in the main text was created. For discussion, see Sirri (2008).

[13] See the report by the Inspector General of the SEC (2008a, 2008b), reporting on the Bear Stearns collapse, was very critical of the CSE program and SEC supervision: "... we have identified serious deficiencies in the CSE program that warrant improvements. Overall, we found that there are significant questions about the adequacy of a number of program requirements, as Bear Stearns was compliant with several of these requirements, but nonetheless collapsed. In addition, the audit found that [the SEC] became aware of numerous potential red flags prior to Bear Stearns' collapse, but did not take actions to limit these factors." (pp. viii–ix).

[14] In 2007 the GAO reported to Congress that the Federal Reserve, the Office of Thrift Supervision (OTS) and the Securities and Exchange Commission (SEC) "employ somewhat different policies and approaches to their consolidated supervision programs" and reiterated a recommendation that Congress modernize or consolidate the regulatory system. See General Accounting Office (2007).

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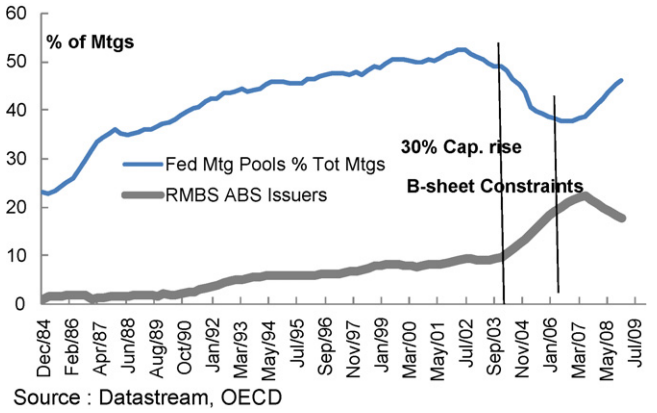

Fig. 3. Federal mortgage pools versus private label RMBS. *Source*: Datastream, OECD.

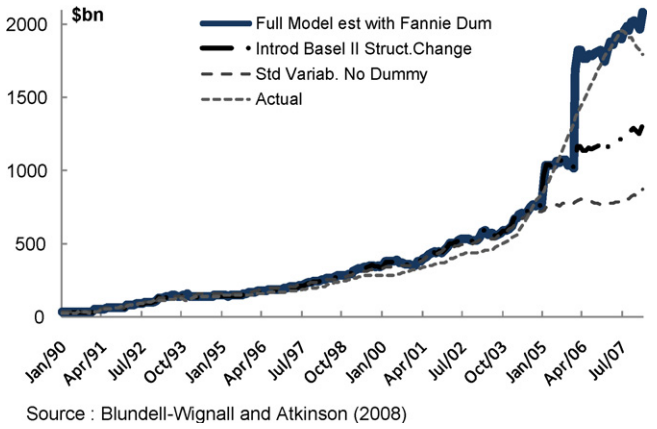

Fig. 4. Model of RMBS and the 2004 acceleration. *Source*: Blundell-Wignall and Atkinson (2008).

broke with the regulatory/structural shifts afterwards. In short, this standard model could not explain the parabolic jump after 2004, as can be seen from the (larger) dashed line in Fig. 4.

The authors then calculated the likely freeing up of capital under the full Basel II system for sophisticated adherents as was known to banks through their participation in the Basel process 4th Quantitative Impact Study (QIS4) simulations during 2004. This would be an additional capital saving of $220 bn by the end of 2007 (in addition to the Basel 1 excess capital). When included in the model, this variable adds a jump of around $0.5 trillion in private label RMBS. When a dummy variable is included post-2004 for the Fannie and Freddie controls and the SEC rule change in 2004 (that allowed IB leverage to accelerate) a further $0.8 trillion is added.[15] This full model result is shown in the thick line. Once these two new variables are added, the coefficients on GDP and other variables are restored to their pre 2004 values. This suggests that the period in which Basel II was anticipated and arbitraged (as in the Citigroup example) and the Fannie and Freddie/SEC changes were in play, banks were able to accelerate RMBS using lower quality mortgages (and supported by American Dream policies) by some $1.3 trillion. Much of the problems now known as the subprime crisis can be traced to these securities.

4. Systemically important firms and contagion risk

The Basel rules and SEC supervision allowed a too-low cost of capital for IBs: their leverage ratio was high and they attracted only a 20% capital weight under Basel I for any bank lending to them. This meant that these high-risk businesses became much bigger than they would have been with a higher cost of capital and better regulation. That is, systemically important ('*too big to fail*') financial firms emerged, as a direct consequence of policy, with excess leverage and lots of concentrated risk on their books.

[15] This corresponds also with the period of the 2004 SEC rule change, and it is impossible to separate this effect from the Fannie and Freddie effect—clearly greater leverage possibilities for IBs greatly helped the response to compensating for Fannie and Freddie constraints.

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At the same time, financial conglomerates too were encouraged by regulatory changes (e.g. the removal of Glass-Steagall) to compete with stand alone IBs through a process of acquisitions and organic growth, where the commercial bank treasury could provide cheap internal funds to the profit-generating IB, allowing its operations to expand and compete more favourably with European universal banks. This was a part of the point being made by US bank lobbying with respect to: the Glass-Steagall Act; and the competitive 'unfairness' of the FDIC Act of 1991—that required US banks to adhere to a leverage ratio. US bank firewall restrictions related to securities dealings between banks and subsidiaries were removed in the late 1990s, and finally ratified with the abolition of Glass-Steagall in 1999.[16]

Competition in the securities business increased, as companies taking the 'low hanging fruit' outperformed their peers, and staff benefited through bonuses and employee stock ownership programs (ESOPs). Bonuses based on up-front revenue generation rose relative to salary, and substantial ESOPs became the norm. This was argued to be in shareholders' interest—the common philosophy being that: "*if you pay peanuts you get monkeys*".[17]

The "originate-to-distribute" business model increasingly replaced the traditional "originate-to-hold" model through the 1990s and has allowed too many decisions to be taken by people or institutions rewarded for completing a transaction, i.e. by collecting a fee, commission or bonus, while transferring the risk to someone else. This represents a shift from a "credit culture" (creating private information about the credits and spreads banks were willing to have on their balance sheet) to an "equity culture" (focused on share price and earnings expansion with staff participation through ESOPs). A greater focus on trading profits and fees via securitization utilising off-balance-sheet vehicles enabled banks to grow earnings while at the same time economising on the capital required under the Basel system. Competition to grow and catch-up with competitors in market share—filling revenue gaps—became commonplace and this brought with it a deterioration in corporate governance and risk controls.

4.1. The UBS example—IB culture and governance[18]

UBS management saw Citigroup and others rapidly growing their fixed income business in IBs through securitization. UBS developed a '*catch-up*' revenue gap strategy at exactly the wrong time from a prudential risk perspective.[19]

In UBS departing top risk managers were replaced by people from a sales background (consistent with growth). The bank has a centralized treasury able to raise funds efficiently in the open market, and it chose to distribute funds internally within the normal external spread:

> "*... i.e. internal bid price bids were always higher than the relevant LIBID and the internal offer prices were always lower than LIBOR*".[20]

A stricter funding model was seen as a '*constraint on the growth strategy*'.

Staff compensation incentives did not differentiate between the creation of genuine 'alpha' versus the creation of returns based on low cost funding, nor the quality (risk attributes) of staff earnings for the company. The relatively high yield from subprime made this an attractive candidate for long position carry trades (even with thin margins) via leverage (and using derivatives). This encouraged concentration in the higher carry mezzanine tranches of CDOs. It also encouraged minimal hedging of super senior positions (in order to be more profitable).

Notwithstanding the fact that the senior management and the board identified the subprime issue as a major risk in September 2006, the IB management did not adjust until July 2007.

5. The policy making process

All of the above developments took place within an overall framework of complex rules and regulation by multiple agencies whose responsibilities have not always been clear or adapted to a changing world. Furthermore, at times these agencies have found themselves with responsibilities that they were poorly placed to carry out. Partial deregulation in such a context can easily lead to "second best" problems, causing worse outcomes by reinforcing existing distortions. This seems to be what has happened.

In the United States the Gramm-Leach-Bliley Act of 1999 (GLB) allowed subsidiaries of banks to conduct most financial activities, and hence to compete with securities firms and insurance companies. Thrifts too were permitted to engage in banking and securities businesses. GLB also streamlined supervision of bank holding companies by clarifying the regulatory role of the Federal Reserve as the consolidated supervisor. Otherwise it reaffirmed the role of "functional" regulation (similar activities should be regulated by the same regulator) of the various affiliates by state and other federal financial regulators, while allowing a number of possible arrangements for supervision at the group level. As early as 2005 the General Accounting Office (GAO) expressed concern about this arrangement, noting: "Multiple specialized regulators bring critical

[16] The repeal was enacted by the Gramm-Leach-Bliley Act on November 12, 1999. See Barth, Brumbaugh, and Wilcox (2000) for a discussion of the lead up to its removal.

[17] According to the Office of the New York State Comptroller, for example, the Wall Street bonus pool rose from $6.2 bn in 1995 to a peak of around $34.1 bn in 2006. In 2008, in the vortex of the crisis, $18.4 bn was paid out in bonuses.

[18] This section is based on UBS (2008). See Blundell-Wignall and Atkinson (2008) for a more detailed summary.

[19] See Bruce (2007). He identifies a $4.3 bn revenue gap to the top three competitors as the most significant revenue opportunity.

[20] UBS (2008, p. 25).

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skills to bear in their areas of expertise but have difficulty seeing the total risk exposure at large conglomerate firms or identifying and preemptively responding to risks that cross industry lines."[21] In 2007 it reported to Congress that the Federal Reserve, the Office of Thrift Supervision (OTS) and the Securities and Exchange Commission (SEC) "employ somewhat different policies and approaches to their consolidated supervision programs" and reiterated a recommendation that Congress modernize or consolidate the regulatory system.[22]

The growing interrelatedness of financial activities at a time when responsibilities for supervision were split between multiple federal and state regulators has led to numerous problems. Where new activities arose, poor decisions were made in allocating supervisory roles. The role of the SEC in supervising investment banks has already been discussed above. Similarly, the OTS was not equipped to supervise either insurance or AIG Financial Products, the IB subsidiary primarily responsible for AIGs collapse. Its role emerged based from the fact that that AIG owned a 'thrift' (Saving and Loans Co.). But OTS had no expertise in CDS contracts and investment banking. The lack of coordination between OFHEO and other regulators from 2004 was a source of unforeseen pressures between Fannie and Freddie and the banks.

In addition to overlapping responsibilities, conflicts of interest can also arise wherever the central bank is responsible for monetary and liquidity policy on the one hand and the prudential safety of banks affected by those policies on the other. This is not an ideal situation.

In Europe the Financial Services Action Plan published in 1999 consisted of 42 measures aimed at completing the single market in financial services by: (i) unifying the wholesale market; (ii) creating an open and secure retail market; and (iii) implementing state-of-the-art prudential rules and supervision. Supervisory responsibilities were left with national agencies, which meant that EU rules were open to different interpretations by different national regulators. This made better coordination of supervision at the EU level a high priority. Under the "Lamfalussy" arrangements, committees of European supervisors for securities, banking and insurance and occupational pensions ("Level 3" committees) have been created to allow national supervisors to communicate and implement rules coherently. However, as the de Larosiere report concludes, the framework lacks cohesiveness.[23] The overall result is that (i) the system is very complex, with financial institutions operating across borders facing a large number of supervisors; and (ii) supervisors' jurisdiction and areas of competence increasingly failing to align with financial firms' actual operations, creating, at minimum, complexity in risk management and regulatory compliance.

6. Dealing with the crisis and reforming regulation

In essence the current crisis is a solvency crisis, which has been exacerbated by liquidity problems as uncertainty rose. This has led to massive deleveraging with rapid negative impacts on the economy.

Containing the current crisis has already required massive support for failing or failed financial institutions in many jurisdictions. So long as property prices continue to fall and recession damages the quality of bank assets, new cases requiring support will emerge. Too many banks whether still independent or bolstered by state aid are unable or unwilling to function normally. As a result the credit crunch persists, and confidence in the financial system has continued to deteriorate.

Lessons from past experiences indicate three things governments must do to deal with solvency crises[24]:

1. Expand deposit insurance to prevent runs on banks.
2. Separate bad assets from good assets and deal with them, usually by swapping some form of government risk-free assets for uncertain risk assets, and dealing with the latter over a long-term horizon (via a "Bad bank",[25] quarantining assets with guarantees and sometimes by loosening accounting standards[26]).[27]
3. Recapitalize asset-cleansed banks and encourage them to operate normally (including by reselling them to the private sector where aspects of nationalization have occurred).

The first of these has been completed in the extraordinary emergency measures taken by governments. Unfortunately little progress has been made on the second and third requirements for dealing with a solvency crisis.

6.1. Where are we in dealing with toxic assets and raising bank capital?

A very long period of slow growth as budget deficits are stabilized and slowly reduced in unfavourable circumstances awaits most governments. The reason for this is that countries have not yet dealt with removing toxic assets from bank balance sheets. In the United States, a PPIP (public-private investment plan) has been conceptualized (a reasonably good

[21] Government Accountability Office (2005, p. 28).
[22] See General Accounting Office (2007).
[23] See de Larosiere (2009).
[24] See Blundell-Wignall, Atkinson, and Lee (2009).
[25] As used in Scandinavia in 1991 and in the 'S&L' crisis in the US via the Resolution Trust Corporation (RTC). A version of his latter approach with an interesting funding mechanism was recommended in Blundell-Wignall (2008).
[26] Decisions have already been taken here: the FASB has issued guidance in FSP FAS 157-e which will apply prospectively from June 2009 allowing banks more judgment in determining whether a market is not active and a transaction is not distressed when discounting future cash flows of assets held to maturity (as opposed to the fair market price at the current time) on a bank's balance sheet.
[27] Mergers between systemically important banks have not been included here as a serious policy option. The reason for this is that no new net capital is added to the joint entity, and such actions have the effect of creating even larger (and usually weaker) systemically important 'too big to fail' institutions.

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Table 2
19 US stress tested banks: capital, assets and off-balance sheet exposures.

	2007 and 2008	2009 and 2010 (baseline)
Capital end 2008	608.0	
Assets end 2008	10892.5	
Leverage ratio	17.9	
Balance sheet write downs	563.6	
SCAP consistent baseline loss forecast		361.3
Capital raised	444.3	0
Shortfall balance sheet	119.3	480.6
Balance sheet cap needs (ex VIEs)		480.6
Off-balance-sheet exposures		
VIEs now consolidated onto balance sheet (end 2008)	110.0	
VIE outstanding (end 2008 unconsolidated)	796.3	
Unconsolidated VIE loss exposure		389.4
Losses banks are responsible for SCAP + VIE	563.6	870.0
Less earnings estimates (see memo below)		434.0
Memo items		
QSPE Outstanding end 2008	3192.4	
QSPE Loss estimates (not a US bank problem)[a]		567.0
IMF forecast for all US bank losses	563.6	1040.4
Underlying earnings p.a. at 2% on assets (end 2008)		436.0

Source: OECD, Bloomberg, Company Reports.
[a] Using US SCAP assumptions for balance sheet losses.

plan), but little has happened. Within Europe, Switzerland moved on the toxic assets of UBS, but only a couple of EU countries have even started to conceptualize 'bad banks'; little has happened.

Table 2 shows some US balance sheet loss forecasts in 2009 and 2010, consistent with loss rates used in the US Fed stress test study, the Supervisory Capital Assessment Program (SCAP), amounting to $361.3 bn.

Together with known write downs for 2007 and 2008 of $563.6, this implies overall losses of $924.8 bn for the full period 2007–2010. However, capital already raised amounts to $444.3 bn, so the net balance sheet capital to be raised over the next 2 years (to leave the leverage ratio unchanged at 17.9) is $480.6 bn. This would not seem such an onerous task, as underlying earnings of say 2% on assets over this period (see the bottom of Table 2) would raise $436 bn, assuming no growth of assets and no dividend. That would see the problem solved before mid 2011.

However, unconsolidated bank VIEs are not taken into account in this analysis.[28] Banks' own estimates of maximum loss exposure on these items are equal to $389.4 bn for the 19 banks: so total losses that banks are responsible for could be as high as $870 bn. If banks' underlying earnings are allowed for at 2% of assets, that would leave a further $434 bn (see bottom right of Table 2) to be dealt with after 2010—essentially a further 2 years. This level of call on earnings (or further dilution) is presumably already reflected in very low bank share prices.

Table 3 shows similar European balance sheet metrics to those shown above for the USA.

The European banks shown (those reporting losses) have a leverage ratio of 36.2, about double that of their US counterparts—that is, considerably less capital to support their balance sheet assets. Balance sheet losses to date seem to have been matched by capital raised. IMF forecasts for European bank losses over the next 2 years of $300.9 bn on assets of over $39 trillion seems small, and apparently well inside their potential earnings capacity over that period (shown at the foot of Table 3). However, to achieve the lower US leverage ratio (itself likely too high) European banks would need to raise another 1 trillion dollars.

Furthermore Europe is much less transparent about bank reporting of off-balance sheet and derivative exposures. Problems only become more transparent as groups fail (as with Hypo Real Estate and DEPFA). Losses related to structured products could prove to be material. This suggests that Europe could be in a serious situation.

Less transparent approaches do not change anything. Banks know the facts and they won't lend anyway if they have no capital and are dealing with regulators behind the scenes to restructure their balance sheets, so that deleveraging continues. Lack of transparency can result in delays in policy action and bigger losses in the end for taxpayers. It will also result in bad-will from investors and a permanent rise in the cost of capital: the political risk premium from investing in financial firms will rise.

6.2. Where are we on longer-run regulatory reform?

In the longer run reforms are needed in a number of areas to create incentives in financial markets that encourage a better balance between the search for return and prudence with regard to risk. The risk at present is that the magnitude of the fiscal

[28] Bank off-balance sheet funding in the US frequently used Variable Interest Entities, linked through letters of credit and other mechanisms. When these can't be funded and asset prices fall, they are consolidated onto the bank's balance sheet.

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Table 3
European loss reporting banks balance sheet items (billions US dollars).

	2007 and 2008	2009 and 2010 (baseline)
Capital (end 2008)	1076.9	
Assets (end 2008)	39645.7	
Leverage ratio	36.8	
Balance sheet write downs	436.1	
Capital raised	399.9	
IMF loss forecast		300.9
Shortfall balance sheet	36.2	337.1
Less earnings (see memo below)		−445.9
Capital to get to the lower US leverage ratio		
Assets allowing for 5% growth		43709.4
Capital required for leverage ratio of 17.9 (USA)		2441.9
Total required capital (assumes no off-balance sheet exposure)		1996.0
Shortfall in capital for a 17.9 leverage ratio		919.0
Off-balance-sheet issuance + share US QSPE's		
Total European issuance of CSO's to 2009Q1 (book val.)	2141.9	
Share of US QSPE issuance?	UNKNOWN	UNKNOWN
Loss exposure that banks are responsible for	UNKNOWN	UNKNOWN

Memo earning per annum at 2% on assets end 2008 $793 bn.
Source: OECD, Company Reports, Credit Flux.

and other support measures taken will see some return to growth, and the appetite for fundamental reform of the main factors that caused the crisis will diminish. The most important requirements of policy to reduce the risk of future recurrences of periodic financial crises are: (i) choosing the least-distorting emergency measures, (ii) undertaking fundamental reform relating to the causes of the crisis, and (iii) unwinding the extraordinary measures taken to combat the crisis—the exit strategy.

The exit strategy requires us to think about '*exit to what*'—surely not to similar incentive structures to those prior to the crisis. A sound framework requires some very basic building blocks that all jurisdictions should work to have in common:

- *The need for a lot more capital*—so that reducing the leverage ratio has to be a fundamental objective of policy. With a leverage ratio framework higher capital levels are assured, and would be more prudent than has been typical for regulated banks and securities firms in recent years. There would also be a clear understanding that in normal circumstances banks should also hold a significant, though unspecified, cushion of tangible equity beyond the minimum. A leverage ratio requires management decisions about allocating capital to risky activities to take account of the full market cost of capital, and the potential risks and rewards of investing in the asset, and would not be influenced by regulatory rules specific to that asset. Any dynamic provisioning rules to reduce pro-cyclicality should be set to function above the minimum regulatory capital required for the leverage ratio.
- *The elimination of arbitrage opportunities in policy parameters* to remove 'subsidies' to the cost of capital. This means many features of the Basel system for capital rules should be eliminated (and the leverage ratio may well become the binding constraint, as recommended in the Turner Report and in the OECD).[29] It also means looking at the way income, capital gains and corporate tax rates interact with financial innovation and derivatives to create concentrated risks and to eliminate ways to profit from such distortions.
- *The necessity to reduce contagion risk within conglomerates*, with appropriate corporate structures and firewalls. This issue is not unrelated to the 'too big to fail' moral hazard problem. It must be credible that affiliates and subsidiaries of large firms cannot risk the balance sheet of the entire group — and that they can be closed down by a regulator leaving other members of the group intact. In this respect examining the role of non-operating holding company structures has been recommended by the OECD.[30] These involve legal separation of the parent from its affiliates. They facilitate: internal terms and conditions for affiliates more akin to those that would apply to dealing with outside entities; balance sheet protection of the banking group; better transparency for outside analysts; and easier regulatory intervention (including use of firewall rules and resolving a failed affiliate).
- *The avoidance of excessive competition in banking/securities businesses* (the '*keep on dancing*' problem) and a return to more emphasis on the 'credit culture' banking model. The stable oligopolies in Australia and Canada have been resilient in the current crisis lending support to this idea.
- *Corporate governance reform is required*, with the OECD recommending: separation of CEO and Chairman (except for smaller banks where the CEO is the main shareholder); a risk officer reporting to the board and whose employment

[29] See Financial Services Authority (2009) and OECD (2009).
[30] GE Money Bank and Macquarie bank in Australia have used these structures to advantage in the crisis. See OECD (2009).

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conditions do not depend on the CEO; a 'fit and proper person' test for directors expanded to include competence, and fiduciary duties clearly defined. These reforms would go a long way to dealing with remuneration issues that have been strongly debated of late.

- The need to rationalize the governance of regulators in some key jurisdictions that failed dismally in the lead-up to this crisis. The benchmark for a sensible regulatory structure is the 'twin peaks' model — an "objectives based" consolidation of authority in separate prudential and business conduct regulators, as has been adopted in Australia,[31] would streamline arrangements substantially in many countries. In the EU establishment of a single bank regulator, already recommended by OECD,[32] would be a good first step. Both within and beyond the EU, complexities would remain at the international level, but with fewer agencies, communication and coherent cooperation would probably be easier. A basic guiding principle, however, should be that the creation of new agencies without reducing the number of existing ones and reformulating mandates should be avoided. Central banks should not be prudential regulators and supervisors. This leads to conflicts of interest.

6.3. Exit strategy

As signs of stress in markets decline, the dismantling of emergency liquidity and official lending support should become a higher priority, in order to remove subsidy elements and to restore a level competitive playing field. This should not be rushed, and should have a voluntary aspect to avoid exacerbating the crisis. This is because the transfer of obligations from the public to the private balance sheet will involve lower prices (higher interest rates) which will constrain growth. A similar process should be applied to the unwinding of guarantees, which distort risk assessment and competition. These should not be precipitously withdrawn, but as the secondary market develops to price guarantees efficiently, and to the extent that extensions can be avoided, terms and conditions prevailing in the broader market should facilitate adjustment. Where financial institutions are concerned, the ultimate goal of the exit from guarantees is to gravitate to alignment with a redesigned comprehensive deposit insurance scheme.

As progress is made with some of the above issues, governments will wish to exit from their holdings of bank shares. Banks may also put pressure governments to exit quickly. But speed is less important than getting it right. If some banks are in a sound capital position before others, competitive distortions could arise if firms are privatized at different times before reforms are in place. To some extent the time line for this process should be dependent on the speed of regulatory and corporate governance reform.

Another consideration is the need for much higher capital levels for banks. Experience suggests that large privatization programs can put strains on available sources of equity capital. One aim of the privatization process is to encourage sources of funds that raise equity net of any leverage (since leverage is at the very centre of the subprime crisis). Pension funds and Sovereign Wealth Funds (SWFs), for example, would be less levered investors than other banks or hedge funds.

7. Conclusions

It seems very unlikely that the building blocks for financial reform will be in place any time soon — many governments do not even accept all of those outlined above as desirable features. Certainly the US proposals for regulatory reform of June 2009 are very far from the ideals presented above.[33] In course of 16 months the US Treasury has come up with not less than three very different sets of proposals—the first was quite radical and very close to the ideal benchmark noted earlier, but the revisions all moved away from this.[34] The starting point for reform is always the current rules, regulations and institutional structures, and the process of change is always at the margin. Groupthink implicit in economic and market paradigms, unfortunately, takes a long time to change.

So, exiting from government ownership of banks, and from guarantees and loans and other forms of aid, will likely occur in a second best environment. Toxic assets and recapitalization will be dealt with slowly, and the drain on bank earnings and share dilution will work against a rapid exit from extraordinary crisis measures. As a result, the exit strategy process (i.e. the transferring stock and debt from the public to the private balance sheet and cutting budget deficits) will risk more financial price volatility.

One can be even less optimistic about the reform of global exchange rate regimes and the dollar reserve currency problem. Easy liquidity and carry trades will provide short-run opportunities for quick returns, but slow economic growth and rate pressures will persist.

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[31] US Dept. of the Treasury (2008), endorsed this approach and proposed that the United States adopt it. See, also, Wellink (2009).
[32] See OECD (2008).
[33] See US Dept. of the Treasury (2009b).
[34] The first 2008 proposal appears to have been superseded by new proposals announced on 26 March, 2009 (see the US Dept. of the Treasury, 2009a). These were then surpassed by those in the US Dept. of the Treasury (2009b).

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