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Bank Capital Management and Macro-prudential Regulation

The article analyses bank capital management from a risk management and regulatory perspective. It does so by discussing how financial innovation created systemic risks in the wholesale capital markets prior to the recent financial crisis and how bank economic capital management failed to identify and control these risks. It discusses how micro-prudential regulation is inadequate in itself to control systemic risks and how bank capital regulation is changing to a macro-prudential model. The article suggests that macro-prudential regulation will pose significant challenges for bank risk management and lead to major changes in bank corporate governance.

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I. Introduction

Policymakers have observed that it would be a mistake to 'waste' the financial crisis by failing to learn the lessons of regulatory reform that are necessary to prevent or mitigate a future crisis.¹⁾ Indeed, many commentators have observed that the financial crisis that began in 2007 as a wholesale market liquidity crisis and which intensified in 2008 with the collapse of Lehman Brothers and subsequent bank bailouts was the result of inadequate macro-prudential regulatory controls that allowed financial institutions to expand their balance sheets, along with their leverage, without regard to risks that were building up across the financial system.²⁾ The prevailing approach to prudential financial regulation was essentially micro-prudential, that is, it was concerned mainly with the stability of individual financial institutions, and the response of individual banks to exogenous risks, whilst ignoring the correlation of risks across asset classes and counter-party credit and liquidity risks in structured finance markets.³⁾ The crisis has led to a restructuring of regulation along a macro-prudential dimension that aims to identify and control risks at the level of individual financial institutions and across the financial system.

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1) See *Choongsoo Kim*, Finance Minister of Republic of Korea, Address at the Bank for International Settlements Conference (17. 1. 2011) Seoul, South Korea.

2) *Brunnermeier/Crockett/Goodhart/Persaud/Shin* (2009), The Fundamental Principles of Financial Regulation, Geneva Reports on the World Economy 11, (Geneva: International Centre for Banking and Monetary Studies) p. 18.

3) *Brunnermeier/Crockett/Goodhart/Persaud/Shin* (2009), The Fundamental Principles of Financial Regulation, Geneva Reports on the World Economy 11, (Geneva: International Centre for Banking and Monetary Studies) p. 18.

The paper analyses recent developments in bank capital regulation and whether they achieve macro-prudential regulatory objectives. In doing so, it traces the development of bank capital regulation from the rules-based approach of the 1988 Basel Capital Accord to the process-based approach of the Basel II agreement. The Basel II framework allowed banks to devise models that relied on their own internal default data and statistical value-at-risk models to determine regulatory capital. Banks were already using these models before Basel II was adopted to calculate their economic capital. The financial crisis demonstrates how these models failed to take account of the liquidity risks and counter-party credit risks in the wholesale debt markets while underestimating correlations across asset classes in the mortgage-backed securities market.⁴⁾ These factors contributed significantly to an undercapitalisation of the banking system which weakened its ability to absorb losses when the crisis began. As discussed below, the Basel Committee is presently engaged in deliberations over implementation of the Basel III agreement, which has more or less been agreed in principle, but with several outstanding issues to be resolved.⁵⁾ The article analyses how financial innovation in the structured finance market created systemic risks which were not recognised by regulators and how bank risk management failed to measure and manage the risks affecting bank balance sheets as well as the structural risks in the financial system. The article argues that Basel III and the European Union's Capital Requirements Directive IV continue to underestimate systemic risks, and that effective international and European regulatory reform should focus on equipping host country regulatory authorities with greater powers to implement macro-prudential tools to control excessive risk-taking by global cross-border banks. The regulation of risk management should not be centralised at the group level. This is because there is no one size fits all macro-prudential regulatory approach and that macro-prudential regulation is not well defined in practice and there needs to be a period of experimentation by national authorities before tested approaches are adopted by international standard setters. Countries must be given discretion to experiment with different macro-prudential tools whose effectiveness will vary from country to country. This means that bank capital management should be decentralised from the group level and based on diverse approaches across countries and different economies. This would give national authorities a wider array of regulatory tools to address the particular risks that different banking groups and conglomerates pose to their financial system. This would be an important step in creating incentives for bank management to take more efficient risks that promote sustainable economic growth for the country or region in question.

II. Financial innovation and the risks

For most of modern history the availability of credit has been segmented into two markets: the banking and mutual savings institutions and what may be described as the informal lending sector: a plethora of informal, unregulated direct lending mechanisms (person to person, credit co-operatives, micro lending, and so on). Whilst a significant proportion of retail

and small business lending may have gone through the informal markets, the majority of all borrowing and almost all large corporate borrowing have gone through the banking market.

As the global capital markets have evolved over the last thirty years a new source of credit – generally referred to as “bank disintermediation” – has grown exponentially. Beginning in the 1970s, the growing corporate bond market effectively disintermediated the banks by directly pairing off non-bank providers of liquidity with corporate and sovereign borrowers. The banks themselves benefited from the growth of non-bank bond investors by tapping this sector for its own senior and subordinated liquidity needs. Having established a huge investor base of non-bank credit investors the next step in the bank disintermediation process was to allow assets traditionally funded on bank balance sheets (corporate loans, mortgages etc.) to be moved into separate companies and financed by these same non-bank liquidity providers.

It is this last development that has seen enormous growth over the last decade as bank loans, bonds, credit derivatives and a growing array of retail asset backed securities (ABSs) were packaged into collateralised debt obligations (CDOs) and structured investment vehicles (SIVs) and sold to non-bank investors. Understanding the drivers for this change and its regulatory consequences requires consideration of the motivations of both the banks and the fixed income investors, as well as the impact of the development of new products.

This credit disintermediation of the bank maturity transformation process involved a shift away from a bank-based model of finance to a wholesale capital market model of finance.⁶⁾ While this has brought diversification and increased liquidity to financial markets, it has also introduced systemic risks to the financial system which bank risk models have failed to identify. Specific types of financial innovation – such as securitisation and credit default swaps – that began in the 1980s and 1990s, partially in response to Basel I's regulatory capital requirements,⁷⁾ changed the nature of financial risk-taking and systemic risk. The development of the structured finance market and in particular the role of securitisation in decomposing and distributing credit risk to wholesale institutional investors who were seeking higher yield in a low inflation environment was crucial in transforming the way that risk was measured and managed. Moreover, the dramatic growth of the OTC credit derivatives market made it possible for enhanced corporate bal-

4) See generally *Alexander/Eatwell/Persaud/Reoch* (2007), *Financial Supervision and Crisis Management in the EU*, IP/A/ECON/IC/2007-069, European Parliament: Brussels.

5) Basel III requires an increased level of Tier One regulatory capital to 7,0 % (including a capital conservation buffer), a tighter definition of tier one capital to include only ordinary common shares, an additional 2,5 % countercyclical capital ratio (yet to be determined for implementation); and liquidity requirements that include a ratio for stable wholesale funding, liquidity coverage ratios, and an overall leverage ratio. Recent the Basel Committee has agreed on an additional capital charge of up to 2,5 % regulatory capital for large and inter-connected systemically important financial institutions (SIFIs).

6) *Kaufman/Mote* (1994), *Is banking a declining industry? A historical perspective*, *Economic Perspectives*, (The Federal Reserve Bank of Chicago), May – June, pp. 2 – 21.

7) *Goodhart* (2011), *The Basel Committee on Banking Supervision A History of the Early Years*, pp. 351 – 368 (Cambridge: Cambridge University Press).

ance sheet management, but it also allowed traders to take excessive risks on the underlying assets in these contracts. And the role of technology and statistical theory in the use of value-at-risk (VaR) models in risk management, which allowed financial firms to calculate how much they expected to lose if the markets turned sharply against them, substantially understated the frequency and severity of financial shocks (so-called 'fat-tailed events'). Other factors contributed to the crisis, including the incentives of rating agencies to provide AAA ratings to complex debt instruments and their failure to use adequate risk-measurement methodologies to assess the underlying risks embedded in these instruments.⁸⁾

III. The Demise of micro-prudential regulation

The micro-prudential approach to regulation and supervision has been predominantly concerned with the stability of individual financial institutions and their responses to exogenous risks.⁹⁾ However, by focusing on individual institutions, such forms of regulation tend to ignore the impact of financial institutions' risk-taking on the broader financial system. For example, the micro-prudential approach often failed to incorporate into regulatory assessments the impact of a bank's size, degree of leverage and interconnectedness with the rest of the financial system. Moreover, bank supervisors generally assumed that banks were primarily exposed to exogenous risks on their balance sheets, and that any change, for example, in their credit or market risk exposures would require them to make balance sheet adjustments (i. e., by buying or selling assets) in a more or less similar manner. Although each bank individually might be adjusting their balance sheet risk in a prudent manner, the cumulative effect of all banks acting in the same manner would be to increase system-wide risks across the financial sector. This could have the effect of exacerbating a market upturn or downturn. Indeed, the *Turner Review* (2009), published in the aftermath of the crisis, argued that this sort of regulation mistakenly and fatally relied on an underlying philosophy and ill-placed faith in market prices as accurate indicators of risk, while financial innovation was viewed to be wholly beneficial. In seeking to regulate at the level of the individual institution, regulators failed to take account of a number of internal amplifying processes which perpetuate the failure of one financial institution through affecting other balance sheets.

As discussed below, the financial crisis demonstrates the need to enhance the micro-prudential regulatory approach to include broader oversight of risks across the financial system and a concern for taking supervisory measures that support the stability of the financial system as a whole and account for the interconnectivity of financial institutions and their effects on the global economy in times of crisis. However, there is a strong tendency in policy circles and the academic literature towards striking a balance between micro and macro-prudential regulation: both are necessary for maintaining financial stability and the conditions for sustainable economic growth. For instance, *Ingvés* (2011) writes that they should reinforce, rather than conflict, with one another, and *Brunnermeier et al.* argue that the two areas of regulation should interact more.¹⁰⁾ Despite the en-

thusiasm for macro-prudential regulation, it is certainly not a panacea, as it does not eliminate the credit cycles in an economy. Nor does it address regulatory failure and government subsidies for banks and financial firms which create moral hazard and can induce unsustainable risk-taking. Moreover, there is an inadequate appreciation of how monetary policy and financial regulation should interact and complement to prevent unsustainable credit cycles.

In the end, whereas the macro-prudential approach focuses on risks across the financial system as a whole, regulatory and policy measures must be introduced at the level of individual banks. It seems, then, that micro-prudential regulation and macro-prudential regulation are not mutually exclusive. Indeed, by linking micro-prudential and macro-prudential approaches a more coherent framework can be developed for mitigating excessive risk-taking in bank capital management.

1. Bank risk management

The main objective of bank risk management is to measure and manage financial risks for a greater risk-adjusted return on equity for shareholders based on the firm's expected profits minus its expected costs for credit, market, liquidity and operational risks. Before the financial crisis, average risk-adjusted returns on capital for non-financial companies in developed countries amounted to approximately 9.5 % across most industry sectors, while average risk-adjusted returns for large banks and financial institutions averaged in excess of 20 %.¹¹⁾ To achieve such returns, firms must take significant risks, which in the financial sector could potentially threaten financial stability. Financial firms, however, have an incentive to hold economic capital at a level required by the market so that the firm can obtain its lowest cost of funding. This is intended to protect the creditors of the firm against default, but it does not take into account the limited liability structure of the firm that incentivises shareholders to pressure management to take on greater leverage to achieve higher risk-adjusted returns but which could potentially put the firm's solvency at risk as well as impose significant social costs on the financial system. Indeed, *Alan Greenspan* recognised this moral hazard problem for bank shareholders to pressure bank management to take greater risks than what are socially optimal when he stated:

"In August 2007, the risk management structure cracked. All the sophisticated mathematics and computer wizardry essentially rested on one central premise: that the enlightened self-

8) The IOSCO *Code of Conduct Fundamentals for Credit Rating Agencies* (2004 (updated 2008)) is an example of an international code aimed at influencing industry practice. See <http://www.iosco.org/library/pubdocs/pdf/IOSCOPD271.pdf> (accessed November 2009). See *Darbellay* (2011), *Regulating Ratings: the credit rating agency monopoly from a regulatory perspective* (Zurich: Schulthess).

9) *Brunnermeier/Crockett/Goodhart/Persaud/Shin* (2009), *The Fundamental Principles of Financial Regulation*, Geneva Reports on the World Economy 11 (Geneva: International Centre for Banking and Monetary Studies), pp. 31 – 33.

10) *Brunnermeier/Crockett/Goodhart/Persaud/Shin* (2009), *The Fundamental Principles of Financial Regulation*, Geneva Reports on the World Economy 11 (Geneva: International Centre for Banking and Monetary Studies), pp. 31 – 33.

11) See *Jackson*, *Beyond Basel II*, presentation at Clare College, Cambridge (12. 9. 2010). See also *Wall Street Journal* (Europe edition) (29. 7. 2011), p. 18 (discussing lower rate of return on equity for banks post-crisis).

interest of owners and managers of financial institutions would lead them to maintain a sufficient buffer against insolvency by actively monitoring their firms' capital and risk position."¹²⁾

Indeed, the Financial Stability Forum observed in an April 2008 report (before Lehman Brothers collapsed) that the 2007 credit crunch was the result of massive failings in risk management in some of the largest and most sophisticated financial institutions.¹³⁾ Executive compensation contributed to excessive risk-taking at banks and other financial firms,¹⁴⁾ while institutional shareholders failed to exercise an effective stewardship role to curb the excessive risk-taking of senior management at leading financial institutions.¹⁵⁾ Risk managers failed to appreciate or understand the externality risks of the structured finance market and in particular to understand the extent of the risks of their leveraged positions in the mortgage-backed securities market and the OTC credit default swap market. This contributed to destructive speculation that fuelled the market bubble and exacerbated the fallout when the markets inevitably collapsed.

2. Balance Sheet Management and bank capital

Any company is sensitive to the size of its balance sheet. Normally the pricing of its liabilities is a function of the size of its balance sheet. Simply stated, the more assets a company has, the more liabilities are needed to finance these assets. To the extent that these liabilities are debt (as opposed to equity), this introduces more leverage, makes the company look riskier and hence pushes up the return expectations of both debt and equity investors. This ultimately translates into a higher cost of capital.¹⁶⁾

Bank management is very sensitive to the expectations of their investors and hence constantly monitor the size of the bank's balance sheet. When the decision is taken to reduce assets the number of options available is limited. Outright sale is one option but where the underlying assets are loans, this is hampered by two factors: first, illiquid loans can be hard to sell. Second, loans sales (normally to other banks) are never popular with the borrower who normally prefers not to see its pool of creditors change. For these two reasons, beginning in the 2000s, banks were drawn to using certain types of structured finance instruments, such as collateralised debt obligations (CDOs), to manage their balance sheets. Illiquid loans can be sold into a CDO more easily than into the secondary loan market. Furthermore, borrowers are more comfortable with their loans being owned by a special purpose vehicle (SPV), which is normally operationally managed by an arranger who is also responsible for transferring the loans from the originator to the SPV as part of the securitisation process.

3. Economic Capital Management

Most banks and financial institutions actively manage their "economic capital" – the equity capital that is needed to support the risks of the unexpected losses associated with holding assets. Whereas the Basel I Capital Accord regulatory approach

used a "one size fits all" approach and merely required an 8 % allocation of risk-based capital, the economic approach uses a model to calculate how risky a portfolio of assets is and how much capital is needed. As discussed below, the intention of Basle II and Basel III is to link regulatory capital to risk ("risk-sensitivity") and hence represents a migration from Basel I approach of increasing bank capital across the board to an economic capital management approach. While this sounds sensible in principle there are substantive definitional issues. Whose risk should the regulator be focused on – the bank's risk or systemic risk? How do we measure risk when we are worried about market failures – using historic prices, market forecasts or non-market measures?

From an economic capital perspective there are three main contributors to risk: the risk of a particular asset (e. g. its issuer may go bankrupt tomorrow), the risk of holding too large an exposure to a particular issuer (100 loans of \$ 1 are less risky than one loan of \$ 100 if the hundred are diversified), and the risk of being exposed to an industry sector that is correlated (during a severe economic downturn all airline issuers tend to suffer and, because they are correlated, tend to look like one large exposure). Further, each of these risks change with the length of the holding period. Whilst the first of these risks can be assessed independently, the other two require a portfolio analysis as the risk of the whole is different from the risk of the parts.

Any transaction that results in the sale of assets that are risky for the institution to hold should have a risk management benefit. For example, a Balance Sheet CDO would generally result in risk reduction. It is unlikely that the only rationale for a CDO is risk management; it is more likely to offer a combination of benefits. A bank may use a CDO to dispose of risky assets but is normally mindful of the fact that investors may share the same negative sentiment and hence there may be little net commercial advantage from the transfer. A bank may also use a CDO to manage its credit lines – the internal limits placed on the total credit exposure to any one issuer. Often banks want to do more with a particular client but are constrained by internal limits. Moving the risk (into a CDO or elsewhere) frees up the credit line.

4. Regulatory Capital Management

Bank regulation generally requires banks to hold a minimum ratio of capital ("risk-based capital") – generally defined in most

12) Financial Times (23. 3. 2009), p. 10.

13) Financial Stability Forum, Report on the Causes of the Financial Crisis of 2007 – 2008 (April 2008) (Basel: BIS).

14) *Ferrarini/Ungureanu* (2011), Economics, Politics and the International Principles for Sound Compensation Practices: An Analysis of Executive Pay at European Banks, 64 *Vanderbilt Law Review*, pp. 431 – 502.

15) See *Alexander* (2012), Implementation of Capital Requirements Directive III Remuneration Rules in the UK: Implications, Limitations and Lessons Learned, IP/A/ECON/WS/2012-18, PE 464.465 (Brussels: European Parliament). See also *Bebchuk/Cremers/Peyer*, The CEO Pay Slice (September 2010), http://www.law.harvard.edu/faculty/bebchuk/pdf/Bebchuk-Cremers-Peyer_CEO-Pay-Slice_Sept2010.pdf.

16) See *Adam* (2008), Handbook of Asset and Liability Management: From Models to Optimum Return Strategies, (Chichester: Wiley).

jurisdictions as equity capital and some subordinated debt – divided by the notional value of any risky assets. Banks monitor their risk-based capital ratio very closely and, from time to time, will take steps to manage it. The sale of corporate assets is one way of managing it as the notional value of risky assets is reduced. A balance sheet collateralized debt obligation (CDO) is an important instrument for allowing a bank to manage its regulatory capital position. CDOs are debt instruments that allow investors with differing risk appetites to invest in a broad range of debt instruments that would normally reside on bank balance sheets.¹⁷⁾ The traditional CDO structure involves the issuance of bonds – “debt obligations” – by an SPV such that the bonds are “collateralised” by a portfolio of assets owned by the SPV.

A balance sheet CDO therefore is a very effective way of managing a bank's RBC as a large number of loans are sold in one transaction. This is often referred to as “freeing up capital” and is part of the overall process known as “Regulatory Capital Management”.¹⁸⁾ Since a bank has a finite amount of capital, there is a quantifiable maximum amount of corporate debt that can be taken on. Selling or hedging debt frees up the capital that was allocated and allows it to be used for new lending etc.

The market, however, has evolved considerably and many of today's transactions are neither collateralised nor debt obligations: both the collateralisation and the debt obligations can be replaced by credit derivatives. The risk of the assets can be transferred using credit derivatives and the form of the investment can also be a credit derivative: no assets need be bought and no debt need be sold. Despite these changes, the term CDO is still used and generally refers to structures where investors have varying levels of risk participation in large diversified portfolios of credit risk.¹⁹⁾

Despite innovations in financial instruments and products, bank capital and risk management failed to limit excessive risk-taking in the banking sector and wholesale capital markets and to provide adequate loss-absorbent capital for banks. Moreover, regulators and policymakers failed to grasp how the so-called ‘shadow banking system’ would fail to self-regulate and the consequent social costs of this failure for the economy. Bank risk management utilised flawed methods of assessing, measuring and managing risk. This provided the ingredients that allowed risk to be under-priced and sold cheaply around the financial system. At the time, regulators and policymakers believed that this spreading of risk created a more resilient and robust financial system based on the enlightened assessment of risks by banks and other financial firms.²⁰⁾ Instead, this regulatory ‘light touch’ approach failed to monitor and stem the build-up of risks in the financial system.²¹⁾

IV. Basel II/III and Regulatory Capital Management

The Basel Committee adopted the initial Basel Capital Accord in 1988 (Basel I) which required banks to hold 8 % regulatory capital against most of their credit risk assets. The Capital Accord aimed to increase the level of bank capital in the global

financial system and provide a level playing field for banks operating across different jurisdictions.²²⁾ More specifically, it applied only to a bank's credit risk exposure on its balance sheet. This rules-based approach to calculating capital was modified in 1995 when the Committee agreed to adopt a Market Risk Amendment to the Accord that expanded the scope of the regulatory capital requirement to include market risk in the bank's trading book. Although banks were still subject to the general requirement to hold 8 % regulatory capital against their trading book risks, they were permitted for the first time to depart from this requirement if they could persuade bank supervisors that their trading book assets merited lower capital charges based on an assessment of the bank's internal data and risk measures. The Market Risk Amendment was a departure from the Capital Accord's rules-based framework for calculating regulatory capital for credit risk because it allowed banks to use their own data and VaR models to calculate regulatory capital for market risk.

The model-based approach for determining trading book regulatory capital was the basis on which the banking industry proposed – and regulators later agreed – that regulatory capital for credit risk should also be calculated using their own data and VaR models that a regulator would accept. In 1999, the Basel Committee proposed further amendments to the Capital Accord to make regulatory capital more sensitive to the risks that banks face, a supervisory review process which involved an assessment of bank corporate governance practices, and enhanced market discipline involving greater use of credit rating agencies and fair value accounting standards for bank assets. These proposed amendments to the 1988 Capital Accord became known as ‘Basel II’, which underwent further amendment and revision before the final text was adopted in 2006.

Basel II was important in a legal and regulatory sense because it adopted a comprehensive process-based regulatory framework which required regulators to interact with banks on an individual basis to assess their risk management and measurement techniques and approve the regulatory capital models they had devised based on their own internal data and VaR (value-at-risk) calculations. If the regulator was happy with the bank's methodology for managing and measuring risk, it could approve the bank's model such that the bank's regulatory capital could depart from the higher regulatory capital level that otherwise would have obtained under the Basel II standardised approach. The bank could opt instead to use either the Foundation Approach or the Advanced Internal Ratings-based

17) The CDO market evolved from the older CBO (bond) and CLO (loan) markets, the name change reflecting the fact that the underlying assets in CDO transactions include a broad range of debt related products.

18) See *Berger/DeYoung/Flannery/Lee/Oztekin* (2008), How Do Large Banking Organizations Manage Their Capital Ratios, *Journal of Financial Service Research*, 34 (2 – 3), pp. 123 – 149.

19) See *Alexander/Eatwell/Persaud/Reoch* (2008), Crisis Management and Financial Supervision in the EU, IP/A/ECON/2008 (Brussels: European Parliament).

20) *Greenspan*, Financial Times (March 2008) stating ‘The Basel Committee ... promulgated a set of capital rules that failed to foresee the need that arose in August 2007 for large capital buffers’.

21) See ‘Report of the High Level Group on Financial Supervision in the EU’, chaired by *Jacques De Larosiere* (Brussels: EU Commission) (25. 2. 2009).

22) See *Norton* (1995), *Devising International Bank Supervisory Standards* (Dordrecht: Kluwer).

Approach as a basis for calculating its credit risk exposures.²³⁾ If the supervisor approved the bank's model for measuring and managing its risk, the bank might hold a significantly lower level of regulatory capital based on its model calculation. In theory, the Basel II process provided an incentive for banks to improve their risk management by offering them reduced regulatory capital if they could demonstrate that their risk-based model adequately controlled the risks that the bank individually faced against creditors and depositors.²⁴⁾ Moreover, Pillar 2 of Basel II entitled 'supervisory review', prescribed broad discretionary powers to supervisors to adjust regulatory capital assessments that were calculated and approved under the Pillar 1 process. Pillar 2 supervisory assessments relied on a set of principles and standards that allowed supervisors to treat banking institutions differently according to the particular risks that they pose.²⁵⁾

Although Basel II was not formally adopted in Europe until January 2007 and not fully implemented in the United States, the flawed model based approach for measuring and managing risk on which Basel II was based had become an industry standard for most large financial institutions in developed economies several years before Basel II was actually implemented into EU law. The model-based approach to measuring risk was already in use by financial institutions in the 1990s to determine their economic capital. The economic capital models of these institutions assumed that volatility was a good proxy for risk. This was based on conventional portfolio management theory,²⁶⁾ and involved the widespread use of volatility-based models, such as VaR. As it turned out, these standardised VaR models badly underestimated the likelihood of significant falls in asset prices based on external shocks and failed to take into account the likelihood of numerous aftershocks. The use of these volatility-based or VaR models for determining bank economic capital was the basis for the development of Basel II, and remains the essential basis for measuring risk under Basel III. This model-based approach for assessing and managing risks requires the supervisor to review the bank's models and risk management practices and, more generally, its corporate governance standards in deciding whether to approve the amount of regulatory capital that the bank proposes based on the calculations of its internal risk-based model.²⁷⁾ The results of allowing banks to use their own internal risk-based models to set regulatory capital were adumbrated by the Basel Committee's five quantitative impact studies (QISs) conducted between 2002 and 2005.²⁸⁾ The five QISs provided a trial run for banks to estimate the potential impact on their capital requirements if they were to implement Basel II. The results consistently showed that most banks, especially the largest banks, across many jurisdictions, would be required to hold much less regulatory capital under the Basel II AIB and Foundation approaches than if they had stayed on a modified version of Basel I. As a result of these studies, protracted and extended negotiations developed over the minutiae of Basel II until final agreement was reached in 2006.

Basel II's market-based approach had become the banking industry's standard prior to the crisis but lacked built-in safeguards against wholesale market liquidity risks and undercapi-

talisation of banks. At the time of its adoption, Basel II was seen as an important regulatory innovation because it created incentives for banks to improve their risk management. If the banks could prove to supervisors that they managed their risk effectively based on probability of default and loss given default data, their regulatory capital would drop to more closely approximate the economic capital they were already holding. Unsurprisingly, this model-based approach led to significantly lower levels of regulatory capital for most banks, especially the most systemically important institutions.

Basel II was proposed to fill some of the gaps in the Basel I Accord. However, it was also a response by policymakers to banking industry lobbies' demands that regulatory capital more closely approximate the economic capital banks were already holding. Banks argued, and central bankers regulators agreed, that global financial markets had become more resilient in the late 1980s and 1990s because of securitization and other forms of structured finance and the growth of the OTC derivatives market.²⁹⁾ In particular, the massive growth of OTC credit derivatives had allowed parties to hedge risks from their balance sheets and to shift risk to those most capable of absorbing risk. The economic capital models used by banks were accepted by regulators as being valid reference points for the calculation of regulatory capital. The economic capital models under Basel II failed to anticipate macro-prudential risks – e. g., drying up of liquidity in the wholesale funding markets – and utilised risk sensitive techniques that could exacerbate systemic risks in the face of extreme events. Essentially, Basel II embodied the failure of financial policymakers and regulators to incorporate systemic risks into the design of regulatory institutions and risk management.

23) Under Basel II and III, market risk can be measured in two ways: the standardized approach or internal models approach, and operational risk can be measured in three ways: basic indicator, standardized or advanced approaches.

24) Indeed, Basel II primarily had a micro-prudential focus that emphasised the role of regulatory capital as protecting creditors and depositors and was much less focused on controlling externalities to the broader financial system. For instance, the Basel Committee guidance for weak banks similarly provided that prompt resolution of a failing bank was necessary in order to protect depositors despite the effect of the bank's resolution on financial stability. It stated '[w]eak banks should be rehabilitated or resolved quickly and banking assets from failed institutions should be returned to the market promptly, in order to minimise the eventual costs to depositors and creditors.' (Basel Committee, 2002, p. 31).

25) This often led to different bank capital rules for individual banks depending on which risk measurement process they used (i. e., Advanced Internal Ratings based Approach or Foundation Approach etc.) which can vary between large and small banks and between different lines of banking business.

26) Indeed, the proliferation of economic capital and other risk management models over the last thirty years were based on the ideas espoused by Professor *Harry Markowitz* of the University of Chicago who won a Nobel Prize based on his seminal article in 1952 which articulated the linkages between volatility and risk which became known as modern portfolio theory.

27) These model-based approaches to measuring and managing risk were adopted by other international financial bodies under the aegis of the Joint Forum on Financial Conglomerates, which oversaw the supervisory standard setting processes in the International Association of Insurance Supervisors and the International Organisation of Securities Commissions.

28) Basel Committee on Banking Supervision, Fifth Quantitative Impact Study, (2005), www.bis.org/bcbis/qis/qis5.html.

29) *Greenspan* quote.

V. Basel III and beyond

The G20 approved the Basel Committee's revised Capital Accord, known as Basel III, in November 2010. Basel III attempts to address some of the weaknesses in Basel II by creating stricter criteria for defining tier one core capital mainly as ordinary shares for a bank which is a joint stock company. Tier one core capital will increase from 2 % to 4.5 % plus an additional 2.5 % capital conservation buffer, bringing tier one capital up to 7.0 %. It also imposes an additional 2.5 % countercyclical capital requirement (yet to be determined for implementation) that would be applicable during a boom period and drop during an economic downturn. The Basel Committee has also approved an additional capital charge of between 1 % and 2.5 % for systemically important financial institutions (SIFIs). SIFIs are defined as banking or financial institutions whose failure would have systemic implications for financial markets either because of their size (i. e., "too big to fail") or interconnectedness with other firms or financial system infrastructure or cross-border impact on a global basis.³⁰⁾

Basel III also creates for the first time liquidity requirements in the form of a liquidity coverage ratio, a net stable wholesale funding ratio, and a leverage ratio. The liquidity coverage ratio would require banks by 2015 to hold a certain ratio of high quality liquid assets (i. e., highly-rated government and corporate bonds) that could be sold in a stress scenario to cover a loss of funding for up to one year. The net stable funding ratio would require banks by 2017 to maintain a positive ratio of incoming funds to out-going funds over a period of time approved by the supervisor. Another important liquidity requirement will be that Basel III will require that banks be subject to an overall leverage ratio of 3 % or 33.5 to 1 (total leverage/total common equity).³¹⁾ These requirements are generally expected to limit the ability of banks to have excessive reliance on short-term funding that could be withdrawn quickly in a severe market downturn.

Unfortunately, however, Basel III has been criticised as essentially building on the edifice of Basel II by incorporating many of its weaknesses, while only strengthening prudential regulation in limited ways by increasing the level of tier one capital and making it more loss absorbent by defining it solely as common ordinary shares. As argued, this fails to address the externality problem posed by financial institutions which requires a more holistic approach to regulation that addresses the maturity mismatches in the wholesale funding markets and other liquidity risks on the liability side of a bank's balance sheet where macro-prudential risks can arise in response to certain types of financial innovation which can threaten financial stability.

Shin (2010) moreover expresses disappointment at the Basel III framework, arguing that it is exclusively micro-prudential. A fixation with "loss absorbency" of individual banks is inadequate in addressing the financial system as a whole, and does not address the excessive asset growth during booms. In response, *Shin* (2010) puts forward an alternative framework which aims to counter this excessive asset growth through caps on bank leverage as away to limit asset growth by tying total as-

sets to bank equity. Furthermore, he suggests a levy on non-core liabilities to mitigate pricing distortions which may lead to excessive asset growth. The effectiveness of the levy lies in its variation over the cycle; it has the greatest effect during boom periods when banks take on non-core liabilities, leaving unaffected the essential function of banks in channelling core funding from savers to borrowers. Following *Shin's* (2010) arguments, leverage limits need to be more macro-prudential in their focus, linking leverage levels to the core functions of banks and thus the broader functioning of the economy.

Despite these weaknesses in Basel III, regulators continue to rely on higher and more loss absorbent capital as the cornerstone of regulatory reforms. This fails to take account of the academic critiques which argue that capital can never be enough, and is no substitute for effective risk management;³²⁾ too often capital requirements are based on a quantifiable aspect of a firm's portfolio, while little attention is given to less quantifiable risks that address structural factors in the financial system. Moreover, some studies have proposed that new capital requirements should be based on fair market valuations that reflect how long a bank plans to hold the asset, and that regulatory capital should consist mainly of equity capital and other loss absorbent capital that can absorb the costs of a bank's failure and mitigate the related social costs. In addition, higher regulatory capital requirements may raise the cost of financing for banks and thus cause them to lend less by reducing the amount of their risk-based assets to meet capital requirements.³³⁾ Regulatory capital requirements therefore should not be seen as a panacea in the regulatory reform debate.

Having outlined some of the ways in which macro-prudential financial regulation might be carried out, I now turn to an examination of some of the practical problems inherent in applying these principles, and to the progress made so far by the United Kingdom in addressing macro-prudential risks. One of the main problems in regulating is in discovering the exact financial position of a financial institution: regulatory authorities need timely and accurate information and this can be difficult to obtain (*Eatwell & Taylor*, 2000). Firms may not keep accurate re-

30) Higher capital requirements for SIFIs are deemed necessary because banks have an incentive to grow larger in part because by becoming larger they can reduce the relative costs of their funding because investors perceive an implicit guarantee by the state to provide direct or indirect financial support to them during times of market stress. The larger a banking group becomes the lower the costs of its funding relative to its operations. Basel III attempts to address this moral hazard problem by imposing additional capital requirements according to the bank's size, inter-connectedness and global reach.

31) Leverage is calculated as the value of assets divided by the value of equity, or in this case, Tier 1 capital. The leverage ratio is the inverse of this, i. e. the value of equity or Tier 1 capital divided by the value of assets. So under the Basel III proposals, banks' assets should not exceed thirty three times the value of Tier 1 capital, or cannot have Tier 1 capital that is less than 3 % of its assets.

32) See *Eatwell/Taylor* (2000), *Global Finance at Risk* (Cambridge: Policy Press), p. 27.

33) According to *Miller and Modigliani*, a firm's cost of finance should not be changed by its allocation between debt and equity; but this is a stylised model in a world where there are no bankruptcy costs and taxes. In the real world, bank debt is tax deductible (therefore cheaper than equity) and moreover debt is favoured by the possibility of creditor claims being reduced or discharged in bankruptcy. This means that higher equity capital requirements for banking institutions will be more expensive than raising debt and will lower average expected returns on equity.

cords and the value of a firm's assets can change quickly. On the other hand, a more pressing problem of regulation lies in the difficulties of regulating on a global scale. *Alexander et al. (2006)* argue that the national level of regulation is not what matters anymore. The failure of several cross-border institutions in the past has taught us that banks operating subsidiaries in multiple jurisdictions pose a very difficult regulatory challenge. *Brunnermeier et al. (2009)* put forward a number of solutions to this geographical problem. In order to achieve a macro-prudential focus, they advocate a focus on 'host country' regulation; banks should be required to set up their local presence as individual subsidiaries that could withstand the default of its parent and thereby minimise the systemic risk, and the same capital and liquidity adequacy requirements would apply to foreign owned systemic subsidiaries as to domestic banks.³⁴ This is required because asset price cycles and the pace of credit expansion vary between countries so counter-cyclical and other macro-prudential measures should be applied by host countries, rather than by the home country of the parent banking group, to financial institutions operating in their own countries.

Given this, it seems that regulations applied to banks should and will differ across countries. There exist limitations for what can be achieved on a national scale, particularly given that legal powers are national in nature. Nonetheless, there is still a need for greater homogeneity in the principles of application and the coordination of policies across the globe (*Turner, 2008*). The European Union is a case in point where the harmonisation of financial supervisory rules and practise is occurring.³⁵ The EU capital adequacy directives set minimum standards for capital, whilst supervision of banks and other financial institutions remained with the home member state authority in whose jurisdiction the bank or firm was based or incorporated. This was seen to be inadequate, however, during the Icelandic bank collapses in 2008: Icelandic authorities had failed to supervise adequately the cross-border operations of Icelandic banks operating in the United Kingdom and had failed to comply with the EU Deposit Guarantee Directive that required Icelandic authorities to repay UK depositors who had lost deposits in Icelandic banks.³⁶ To address this institutional breakdown in European banking supervision, three European Supervisory Authorities were established in 2011 to ensure a more harmonised approach to supervision across the EU through the adoption of technical regulatory and implementation standards. In the UK, Lord *Turner* has raised the issue that effective financial supervision in Europe will require in the future either more or less European control. More Europe will involve greater control of the ESAs in harmonising EU regulation and enforcing member supervisory responsibilities. Less Europe would increase the power of host country supervisors to oversee capital and liquidity of banks. The trade off of this would be a less level playing field for banks operating in Europe. More Europe would entail greater cross-European coordination of supervisory approaches, developing a shared view of emerging risks. Creating such a new European institutional structure would be macro-prudential in its focus while leaving primary responsibility at the member-state level.

VI. Macro-prudential regulation in practice

Recent academic studies have called for an explicit macro-prudential mandate, that is, "an operating strategy that includes leaning against the financial cycle [with] centralised and transparent decision-making".³⁷ Indeed, micro-prudential and macro-prudential policies must work together in order to achieve the common aim of stability in the financial system. *Domanski & Ng (2011)* highlight that suitable and familiar instruments should be used to attain common ends but that the financial cycle should be modelled jointly with other macro-economic variables.

The United Kingdom's legislative and regulatory reforms offer an interesting application of macro-prudential policy in practice. The UK Financial Services Bill 2012 has created a Financial Policy Committee (FPC) in the Bank of England to oversee macro-prudential financial regulation and policy and to adopt Recommendations and Directions to the new UK regulatory authorities – the Prudential Regulatory Authority (PRA) and the Financial Conduct Authority (FCA) – to implement macro-prudential regulations. Specifically, the FPC is charged with identifying, monitoring and taking actions to remove or reduce systemic risks. One of the main powers of the FPC will be to make 'comply or explain' Recommendations to the micro-prudential authorities – the PRA and the FCA – that address system-wide financial risks.

The FPC intends to coordinate the micro-prudential supervisory roles of the PRA and FCA with its macro-prudential responsibilities. Under the Financial Services Bill, therefore, micro- and macro-prudential regulation are carefully partitioned in this structure and are aimed to achieve a more balanced approach to financial regulation that focuses on both the supervision of individual firms to achieve stability and conduct of business objectives, but also broader macro measures that attempt to control the accumulation of risks in the financial system and infrastructure risks (i. e., payment and settlement risks).

Moreover, the FPC is proposing a set of macro-prudential regulatory levers or tools (i. e., counter-cyclical capital requirements and limits on distributions) that could be imposed by the FPC on the financial sector through the micro-prudential authorities. These levers include:

- **Capital requirements:** Capital requirements could be varied depending on the riskiness of assets at points in economic cycle. Counter-cyclical capital buffers could be designed to dampen the credit cycle (for example, by imposing higher capital requirements during a boom).

34) *Brunnermeier/Crockett/Goodhart/Persaud/Shin (2009)*, The Fundamental Principles of Financial Regulation, Geneva Reports on the World Economy 11 (Geneva: International Centre for Banking and Monetary Studies), pp. 31 – 33.

35) See 'Report of the High Level Group on Financial Supervision in the EU', chaired by *Jacques De Larosiere* (Brussels: EU Commission) (25. 2. 2009). See also *The Turner Review* (March 2009) (London: UK Financial Services Authority).

36) To protect British depositors, UK authorities resorted to financial sanctions anti-terrorist legislation to freeze certain Icelandic bank accounts in order to use those deposits to repay some British depositors.

37) *Domanski/Ng, (2011)*, Macro-prudential regulation and policy, BIS Paper No. 60.

- **Liquidity tools:** Financial institutions can be required to hold liquid assets, i. e. assets that can be easily turned into cash. Also, leverage ratios could be used to limit the amount of leverage relative to the value of assets.
- **Forward-looking loss provisions:** Financial institutions can be required to set aside provisions against potential future losses on their lending.
- **Collateral requirements:** Lending could be limited by imposing higher collateral restrictions, for example if growth in lending appears to be unsustainable. An example is a loan to value requirement, which would limit the size of a loan relative to the value of the asset. Similarly, “haircuts” on repurchase agreements would limit the amount of cash that can be lent as a proportion of the market value of a set of securities.
- **Information disclosure:** Greater transparency could help markets work better. For example, in times of crisis, more information about different institutions’ risk exposure could increase the flow of credit as uncertainty is reduced.
- **Stress tests:** Stress testing by either the FPC or the other regulators could allow the FPC to see how resilient the system would be under different, adverse scenarios.

The area of macro-prudential tools is one where there is relatively little evidence and research. *Goodhart* in particular has highlighted that it would be good if macro-prudential authorities such as the FPC did more analysis to understand how the various tools will work.³⁸⁾

In addition, *Goodhart* has highlighted the need to consider what happens if institutions fail to meet their prudential requirements, and whether a “ladder of sanctions” should be considered:

“The more that regulations are now tightened, to represent desirable conditions rather than irreducible minima, the more the question of designing ladders of sanctions, (slight initially, toughened steadily, and ultimately involving intervention by the State to take over the weakening institution), needs to be urgently addressed. The international bodies have always tended to shy away from proposing this, meaning it may have to be tackled by the national macro and micro-prudential authorities. Penalties for violation of CARs (capital asset ratios) have now apparently been built into the current proposals for CRD4 (capital requirements directive IV); the details will need to be examined to consider how appropriate these may be.”³⁹⁾

The FPC’s thinking about macro-prudential regulation has advanced significantly in comparison with other EU and US regulators. In December 2011, the FPC published a discussion paper in which it presented some of the possible macro-prudential tools that could be wielded by the FPC. There is a particular emphasis here on time-varying risks, countered through regulation which aims to deal with cyclicalities in the economic cycle and within certain sectors of the economy. One of the first tasks of the FPC was to recommend in March 2012 several macro-prudential levers to the UK Treasury, which would have to submit them for approval as secondary legislation before

Parliament. The Bank of England and the Financial Services Authority, however, recognised in a published paper in 2011 that the choice of macro-prudential levers was far from straightforward, as they have could impinge substantially on economic activity and there was little hard evidence about how they would work in practice. For example, the Bank and FSA suggested that varying loan-to-value or loan-to-income ratios on mortgage lending would directly limit risky lending, but would also be very difficult to calculate because of “the trade-off between financial stability benefits, economic activity, and societal preferences for homeownership”.⁴⁰⁾ Moreover, the paper notes that limiting or regulating bank remuneration or distributions to shareholders may have the effect of penalising well-managed banks alongside weak institutions. Similarly, the paper also observes that imposing too stringent controls on trading and clearing infrastructure may have the effect of driving this activity to less tightly regulated jurisdictions. The Australian experience of requiring banks to hold capital against off-balance sheet exposures was cited as a macro-prudential regulatory lever that could work effectively with limited downside effects. Finally, the paper raised the important issue of whether UK regulatory authorities would have enough discretion to apply macro-prudential levers without violating harmonised EU regulatory standards.

VII. Shadow banking

Macro-prudential regulation should also focus on the ‘shadow banking’ system where financial intermediation occurs outside the formal banking sector by non-bank financial firms which engage in maturity transformation and take on leverage by issuing debt-linked instruments to generate capital to invest in longer-term assets. Of particular concern are intermediaries involved in the money and credit creation process. Regulatory instruments should aim to affect the balance sheets of financial institutions by limiting the aggregate level of leverage and maturity mismatch in the financial system as a whole. These controls could be tightened during periods when there are asset price bubbles (when asset prices exceed trend economic growth) and relaxed when the economy or financial sector slumps.

The existence of other, non-bank financial institutions therefore imposes a constraint on the ability to place requirements on banks, as there is a danger of risky activities moving into non-regulated sectors. However, this also suggests that it may make sense to consider reforms across the sector as a whole, rather than focusing too much on particular types of institutions. Indeed, *Goodhart* takes the view that there should be a degree of harmonisation of “margin controls” such as capital ratios, saying that:

38) *Goodhart*, The Macro-Prudential Authority: Powers, Scope and Accountability, Morgan Stanley Research, (September 2011).

39) *Goodhart*, The Macro-Prudential Authority: Powers, Scope and Accountability, Morgan Stanley Research, (September 2011).

40) Bank of England, Report (December 2011).

“There is a ‘level-playing-field’ argument between institutional arrangements within countries, as well as between countries. The imposition of (asymmetric) penalties (taxes) on the most visible, largest and probably the most efficient intermediaries (i. e. the banks) may have an increasing effect in diverting such intermediation towards less visible, and possibly less efficient channels.”⁴¹⁾

In addition, insurance companies can also pose a risk to taxpayer money. For example, during the last crisis, AIG, a US insurance company, sold a substantial amount of credit default swap coverage to banks and other investors. These derivatives turned out to be riskier than assumed and AIG subsequently had to be bailed out by the Federal Reserve. If AIG had defaulted, banks to which AIG owed money would have experienced substantial losses that could have toppled the US financial system and several major European banks.

VIII. CRD IV and macro-prudential tools

In the EU, Basel III will be implemented under the Capital Requirements Directive IV (CRD IV).⁴²⁾ CRD IV sets out a number of measures, covering capital and liquidity requirements and leverage ratios which Member States would be expected to enforce within their jurisdictions. The CRD IV largely adopts the main requirements of the Basel III agreement into EU law. However, the CRD IV goes beyond Basel III in important areas, such as by requiring that Member States provide that appropriate administrative sanctions and penalties be imposed on banks and credit institutions for violating the CRD and other EU banking legislation. The Directive will require them to comply with common minimum standards on:

- types of sanctions (and against whom to apply them),
- the level of fines,
- the criteria to be taken into account by competent authorities when applying sanctions,
- the publication of sanctions,
- the mechanism to encourage reporting of potential violations.⁴³⁾

Under the current draft of CRD IV, the European Commission is proposing to set a level of capital requirements that all EU member state authorities would have to apply to all credit and investment services institutions operating in their member states. CRD IV enhances the authority of local supervisory authorities to ensure that the branches of EEA banks that passport into their jurisdictions comply with minimum capital, liquidity and corporate governance of the CRD IV. Under the proposals, Member States can apply stricter requirements to institutions based in their jurisdictions in some circumstances. They can impose higher national requirements if these can be justified by national circumstances; for example, higher capital requirements for real estate lending could be imposed to address real estate bubbles. Such requirements would apply to institutions from other Member States that do business in that Member State. In addition, each Member State is responsible

for adjusting the level of its countercyclical buffer⁴⁴⁾ to its economic situation and to protect the economy/banking sector from any other structural variables and from the exposure of the banking sector to any other risk factors related to risks to financial stability.

Under the Basel III/CRD “Pillar 2” system, Member States have discretion to impose a range of measures, including additional capital requirements, on individual institutions or groups of institutions in order to address higher-than-normal risk.⁴⁵⁾ Therefore, theoretically, national supervisors should be able to impose higher requirements if they so wish. However, whether they are able to do so in practice may depend on the threshold for evidence required to justify any deviation from the baseline requirements set in CRD IV, and whether it is practical to implement such requirements.

In addition, experts have observed that countercyclical buffers could be difficult to implement.⁴⁶⁾ This is more likely in situations where different countries are in different stages of the economic or financial cycle.⁴⁷⁾ Increasing capital requirements in one country could result in activities moving elsewhere. On this issue, *Goodhart* has said:

“... such financial cycles are not uniform across countries, as was exemplified during the build-up to the current crisis, with USA, UK, Spain, Ireland, Iceland having much stronger financial cycles than Germany, France, Italy and Japan. So, if there is to be some counter-cyclical element in the application of ratio requirements, this would seem to push responsibility for such actions back to national authorities and raise again the ‘level-playing-field’ issue.”⁴⁸⁾

Under CRD IV, home and host country supervisors are given discretion to experiment with different macro-prudential tools whose effectiveness will vary from country to country. This means that bank capital management strategies will have to be differentiated across EU and other countries to comply with differently regulatory and economic risks. This could lead potentially to different capital and liquidity requirements across

41) Bank of England, Report (December 2011).

42) CRD IV consists of a Directive that addresses mainly the Basel III pillar II issues of corporate governance, counter-cyclical capital requirements, and risk management, and a Regulation which specifies more detailed requirements for states to determine how EEA banks should calculate regulatory capital and liquidity requirements. The use of a Regulation to implement capital and liquidity standards is a significant change from past EU bank regulation practice: previous EU capital adequacy laws were directives that afforded member states discretion in implementing the directive into member state law and regulation.

43) CRD IV Frequently asked Questions, European Commission, available here: <http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/11/527&format=HTML&aged=0&language=EN&guiLanguage=en>.

44) The countercyclical buffer would allow regulators to require banks to hold additional capital during good times, both to slow the growth of credit and to build reserves to absorb losses during bad times.

45) CRD IV Frequently asked Questions, European Commission, available here: <http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/11/527&format=HTML&aged=0&language=EN&guiLanguage=en>.

46) *Brunnermeier/Crockett/Goodhart/Persaud/Shin* (2009), *The Fundamental Principles of Financial Regulation*, Geneva Reports on the World Economy 11, (Geneva: International Centre for Banking and Monetary Studies), chap 4 (discussing the design of counter-cyclical regulation).

47) *Ibid.*, chapter 4 (discussing the design of ‘counter-cyclical regulation’ and bank capital regulation).

48) *Goodhart*, *The Macro-Prudential Authority: Powers, Scope and Accountability*, Morgan Stanley Research, (September 2011).

different EU member states as well as with countries outside the EU. Although the European Banking Authority will propose harmonised technical implementing standards, these Basel III-type standards are not prescriptive as they introduce a process-based framework for measuring and managing risk which will lead to different risk management approaches, including possibly different capital and liquidity standards for cross-border banks across different countries. This should result in a reversal of the recent trend of the centralisation of risk management at the group level for global financial groups. Indeed, the flexibility built into the CRD IV and Basel III should lead global financial groups to follow a more decentralised approach to risk management, thereby leading to more diverse approaches to measuring and managing risks across countries and different economies. This would give national authorities a wider array of regulatory tools to build a more robust micro- and macro-prudential approach to bank capital regulation.

However, this raises the question as to whether Basel III and the CRD IV will be consistently and faithfully implemented across countries and jurisdictions. There may, therefore, be potential for inconsistencies with some countries applying more lenient approaches for regulating bank capital management. This could in turn make it more difficult for countries with international financial centres, such as the UK, to impose stricter requirements on banks, because of the risk of financial activities migrating to other jurisdictions with less stringent requirements.⁴⁹⁾ In fact, one of the major challenges confronting the Basel Committee concerns whether it can be implemented consistently internationally and to what extent will regulatory arbitrage undermine its application and the extent that national authorities can experiment with different macro-prudential approaches.

IX. Conclusion

To return to the aphorism that policymakers should not let a good crisis go to waste, there might be a new paradigm in global regulation in theory but how close this is mirrored in policy is another matter as macro-prudential policy is undoubtedly still in its infancy. The financial crisis has triggered intense regulatory reform efforts to enhance bank risk management and the use of micro-prudential and macro-prudential regulation to achieve financial stability objectives. The paper suggests that bank capital management and risk measurement must be

built on a more holistic approach to financial regulation and supervision that involves linking micro-prudential supervision of individual banks with broader oversight of the financial system and to macroeconomic policy. Not only should regulation focus more on macro-economic factors, such as liquidity risks, but it should also develop capital adequacy standards that have linkages and reference points in the broader macro economy, such as countercyclical capital ratios. It has been recognised that the intellectual framework embodied in Basel II, with its heavy emphasis on 'market sensitive' regulation, was entirely inappropriate to the conditions in the markets that led to the financial crisis. Indeed, the inherently procyclical character of micro-prudential regulation increased instability. In consequence, there has been a widespread call to develop a macro-prudential approach to controlling systemic risk and bank risk-taking. This has led to a number of policy proposals and macro-prudential regulatory approaches that would require much higher regulatory capital levels.

Basel III reforms attempt to address these weaknesses but remains embedded in the failed risk model approaches of Basel II. Basel III reforms however continue to incorporate a disproportionate reliance on a statistical view of risk management, while ignoring broader structural risks to financial stability. Much more work needs to be done in reviewing Pillar 2 of Basel III to address this overreliance on a micro-prudential statistical approach to measuring risks that fails to take into account macro-prudential risks. National authorities should be encouraged to experiment with different macro-prudential approaches that utilised different tools to control systemic risk. The UK Financial Policy Committee has engaged in useful preliminary work in assessing various macro-prudential tools and the extent to which they impinge on economic activity. It is clear that macro-prudential regulation will have important implications for economic policy. This is why democratic safeguards should accompany the decision to use macro-prudential controls. Moreover, macro-prudential regulation will have to be coordinated at the European and international level, but host country authorities should have the ultimate say in ensuring that these tools are applied effectively and adequately address the risks of that country.

49) The UK Government have accepted the proposals of Independent Commission on Banking (the Vicker's Commission) that would require UK banking groups to put all retail banking activity into a separately capitalised subsidiary that would be separate in its governance and risk management from the rest of the financial group. See HM Treasury, Banking reform: delivering stability and supporting a sustainable economy CM 8356 (June 2012), pp. 20 – 32.