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The New Basel Capital Accord: A Primer with an Indian Focus*

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1. Introduction

It has been widely observed that throughout the world, during the decade of the 1970s, the capital ratios of banks in developed economies declined precipitously. In an attempt to reverse this decline, banks regulators issued guidelines on capital standards for banks (and bank holding companies, as in the United States) in December 1981. These standards required banks to hold a fixed percentage of their assets as capital. Although these minimum regulatory standards have been given credit for arresting deterioration in bank capital levels, the 1980s witnessed a significant number of bank failures and a massive downturn in US stock markets in 1987 (the “black Monday”). As a consequence, the rationale for the stipulation of fixed capital to asset ratio was called into question. Research by Alfriend (1988) around that time also confirmed that a weakness of the minimum standards was that they failed to acknowledge the heterogeneity of bank assets, and as a result, the bank had an incentive to shift their portfolios towards high-risk assets.

In response to these developments, the Basel Committee on Bank Supervision (BCBS) announced the adoption of risk-based capital standards in July 1988. The objectives of the standards were not only to strengthen the international banking system, but also to promote convergence of national capital standards, thereby ironing out competitive inequalities among banks across countries. The 1988 Basel agreement was designed to apply to internationally active banks of member countries of the BCBS with the Bank of International Settlements (BIS) at Basel,

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Switzerland, but the nitty gritty of its implementation were left to national discretion.⁴

The reasons for the primarily G-10 centric structure of the institution of the 1988 Accord are not far to seek. First, over 80 per cent of global banking assets rest with banks incorporated in these countries. Therefore, the focus of banking systems in these countries would need to be a priority agenda. Second, with state-of-the-art information technology being used by banks in these countries, it was believed that a pro-active approach to banking supervision in these countries would necessarily stave off any failures and also address the dangers of contagion stemming there from. While these facts might have had a fair degree of credibility in an autarkic world, the inference may not be as sacrosanct at present. Moreover, the way in which the minimum capital ratio of 8 per cent was incorporated in regulatory regimes varied across countries, with countries applying several variants of the basic standards. The impact of the 1988 Accord rapidly diffused beyond the original G-10 countries and by 1999, it formed part of the regime of prudential regulation not only for internationally active, but also for domestic banking systems in more than 100 countries (BIS, 1999).

From the very beginning, the 1988 Accord was subject to criticism, which was hardly surprising in view of the fact that the agreement had to accommodate banking practices and regulatory regimes in countries with varied legal systems, business norms and prevalent institutional structures. Criticisms were mainly directed at its failure to make adequate allowance for the degree of reduction in risk exposure achievable through diversification and at its arbitrary and non-discriminatory calibration of certain credit risks. Illustratively, a credit to a blue chip corporate was treated in the same fashion as a loan to a lesser-known financial company. The uniform weight attributed in almost all circumstances to private borrowers, regardless of their creditworthiness was considered an incentive to regulatory arbitrage, under which banks were tempted to exploit the opportunities afforded by the Accord's classification of risk exposure to increase their holding of high-yielding,

⁴ BCBS Comprises Belgium, Canada, France, Germany, Italy, Japan, Luxembourg, Netherlands, Sweden, Switzerland, United Kingdom and United States (subsequently extended to incorporate Spain).

but also high-risk assets for a given level of regulatory capital. However, recurring crises over the past two decades in both the developed and developing world have provided graphic evidence of the fact that, given the globalisation and univeralization of banking operations, the onset of banking crises can impact the banking systems in both the home and host countries in equal measure through contagion effects. Since banking crises are difficult to predict accurately and can have devastating effects on the macro-economy (Goldstein *et al.*, 2000), proactive supervision of banks in developed economies while necessary, is not sufficient to prevent failures. Thus, with both international and domestic banking systems coming increasingly under the same regulatory umbrella and the growing interest in adoption of international standards being shown by the non G-10 countries, the distinction between ‘internationally active’ *versus* ‘domestic’ banks, on the one hand, and ‘sophisticated’ *versus* ‘less sophisticated’ banks, on the other, tends to have limited relevance than in the past (Narain and Ghosh, 2003).

It is in this context that, against the light of the historical backdrop of the 1988 Accord, the present paper focuses on the New Basel Capital Accord, its objective, the building blocks and the concerns expressed about the same. The discussion unfolds as follows. A historical backdrop of the New Basel Capital Accord and its broad contours is given in Section 2. Section 3 is devoted to the possible implications of the New Basel Capital Accord for India from the standpoint of the emerging market economies. Section 4 develops a simple empirical model to examine the factors influencing capital position of banks in India. Apart from presenting the concluding observations, the last section also attempts a prognosis of the future scenario *vis-à-vis* the New Basel Accord.

2. The New Basel Capital Accord: Genesis and Major Features

The 1988 Accord reflected a consensus of the member countries of BIS as to the proportions in which various suitable financial instruments could be permitted to be part of the banks’ capital base. Three basic categories of capital could be purported to serve these purposes: debt capital, equity capital and hybrid capital (which combines features of equity and debt). There existed wide divergence in market and regulatory practices among Basel member countries regarding which

instruments could be considered for possible inclusion in the three basic forms of capital. Accordingly, the solution adopted for the 1988 Accord involved distinguishing between two tiers: tier I (comprising equity shares, disclosed reserves and capital reserves) and tier II (comprising less pure forms of capital like hybrid debt instruments, subordinated debt and undisclosed reserves); tier II capital in the aggregate was limited to a maximum of 100 per cent of tier I capital. The pattern of risk weights on assets was accordingly specified, linking the capital position of banks to its risk-weighted assets. The ratio, thus arrived, was not to fall below 8 per cent.

In the years following the 1988 Accord, it was subject to amendments intended to refine and extend its treatment of banks' exposure to credit risk and the list of eligible instruments for inclusion in capital. For example, the 1996 *Amendment to the Capital Accord to incorporate Market Risks* accommodates two alternative ways of measuring minimum levels of capital for market risks: one based on banks' own internal risk- measurement models and the other on a standardised methodology under which capital requirements are estimated separately for different categories of market risk and then summed to give an overall capital charge.

As the reform of banking regulation became an important policy agenda of developing and transition economies (a tendency given impetus by the East-Asian financial crisis), the appropriateness of the Basel standards to such economies became a subject of debate. *Inter alia*, the question was raised as to whether economies vulnerable to macroeconomic shocks and with fragile financial sectors necessitated a more stringent standard than the 8 per cent ratio. At the same time, financial sector stability assessment came to dominate the policy agenda of international agencies with the health of the banking sector and the overall capital position becoming a matter of prime focus. The *Core Principles for Effective Banking Supervision* (BIS, 1997) emphasised the need for banking supervisors to set minimum capital requirements for banks in order to adequately reflect the risks undertaken by banks and simultaneously the need to define the components of capital bearing in mind banks' ability to absorb losses. While such developments were underway, it was increasingly realised that in addition to credit risk (which was the preponderant focus of the 1988 Accord), the growing complexity of banking operations and the move

towards a market-driven financial sector in the aftermath of financial liberalisation across large parts of the globe (Williamson and Mahar, 1998) brought to the fore other forms of risks, such as liquidity risk, market risks and operational risks.

The proposals in the BIS document *A New Capital Adequacy Framework* began in the aftermath of the turbulence in financial markets which followed the Russian Government's forced restructuring of its own short-term debt and its moratorium on the servicing of a wide range of private sector external obligations in August 1998 and the rescue operation of the Long-Term Hedge Fund, which followed in the autumn (Fleming, 1999).

The objectives of the New Basel Capital Accord, as enunciated by the BIS are five-fold: (a) promoting safety and soundness of the financial system; (b) enhance competitive equality; (c) comprehensive approach to addressing risks; (d) greater sensitivity to the degree of risk involved in banks' activities; and (e) focus on internationally active banks, with the capability of being applicable to banks with varying levels of complexity and sophistication (BIS, 2001).

In view of these factors, the Basel Committee proposed a *New Capital Adequacy Framework* (hereafter referred to as the "The New Basel Capital Accord" or "new Accord") in June 1999 incorporating three major elements or "pillars": *minimum capital requirements*, based on weights intended to be more closely aligned to economic risks than the 1988 Accord, *supervisory review*, which set basic standards for bank supervision to minimize regulatory arbitrage and *market discipline*, which envisages greater levels of disclosure and standards of transparency by the banking system. After the first proposal of June 1999, there were two subsequent consultative packages, released in 2001 and 2003. Finally, on 26 June 2004 the central bank governors of the G10 countries endorsed the revised framework for the "International Convergence of Capital Measurement and Capital Standards", commonly known as the new Basel Capital Accord or "Basel II". This endorsement represented the culmination of a challenging project that was carried out by BCBS and its member institutions over an extended period spanning more than five years. The revised Framework has been designed to provide options for banks and banking systems, for determining the capital requirements for credit risk and operational risk

and enables banks / supervisors to select approaches that are most appropriate for their operations and financial markets. The Framework is expected to promote adoption of stronger risk management practices in banks (BIS, 2004; Caruana, 2004).

The specific purpose of the new Basel Accord was to address major shortcomings of the current framework for capital requirements. Towards this end, the new Accord introduces greater sophistication for measuring credit risk capital requirements, in line with current best practices among banks. Furthermore, the new framework aims to reduce the scope for “capital arbitrage” and to make more accurate provision for the effect of risk mitigation measures. In addition, the revised framework introduces a capital charge for operational risk as well as comprehensive requirements for market disclosure. Finally, the scope for supervisory action is extended, as supervisors are expected to evaluate how well banks are assessing their capital needs relative to their risks, and to intervene if needed.

The revised framework aims to safeguard banks’ safety and soundness and to increase the stability of the financial system as a whole. In order to achieve this, the BCBS has provided the new capital adequacy framework with a structure that strengthens incentives for prudent bank management. It also envisages bank supervisors being directly involved in validating a bank’s measurement of risk and in assigning a capital buffer. Finally, by introducing disclosure requirements, it creates an environment in which market participants have better access to information on risks in individual banking organisations and, on this basis, they can exert more effective market discipline. There is, therefore, a “feedback loop” running from market assessment (pillar 3) to the credit weighting structure (pillar 1) which is to be monitored through the supervisory review of capital adequacy (pillar 2).

This comprehensive approach responds to the need for better risk control by aligning regulatory capital to risk-based economic capital. The stability of the banking sector will therefore be enhanced by increased alignment of capital requirements with the risks taken by individual banks. Moreover, the incentive to develop or improve a tailored risk management function within the individual banking organisations will foster efficiency and stability within the system. The active role for supervisory authorities will encourage banks to further develop their risk management functions, while market participants will have sufficient information to

adequately assess the risks, performance and overall capital adequacy of an institution.

Much of the concern about the New Basel Capital Accord comes from the first pillar of minimum capital requirements. As per the January 2001 Consultative Paper (BIS, 2001), banks can choose from the following three evolutionary variants to measure the risks, *viz.*, (a) a basic standardized model (modified version of the existing approach), (b) an internal rating based (IRB) foundation model, and (c) an advanced IRB model. While the basic standardized model is based on the ratings of the external rating agencies like Moody's or Standard & Poor's, a basic requirement for the foundation or advanced IRB model is to develop the Bank's own internal rating system. It may be noted that depending on which model is chosen the capital requirement will vary. This has important implications for the emerging market economies.

Furthermore, as far as the minimum capital requirement of a Bank is concerned, it needs to be noted that the New Accord makes a distinction between credit risk, market risk and operational risk, so that, regulatory capital is sum of capital requirement on account of these three risks. The definition of capital in the New Basel Capital Accord has been retained unchanged from that of the original Accord.⁵

Much of the discussion stimulated by the New Basel Capital Accord has focused on its standardised approach to the risk weighting of different elements among the assets of banking books. This is because of the proposed reliance on external credit assessment institutions in delineating risk weights. The calibration of sovereign risk weights is considerably finer than that of the 1988 Accord; with the highest risk weight allowed being 150 per cent, instead of 100 per cent as in the 1988 Accord.

⁵ Note that, in calculating the capital ratio, the total risk weighted assets (or the denominator) will be calculated as follows (since, 12.5 is the reciprocal of the minimum capital ratio of 8 per cent): Total Risk Weighted Assets = 12.5 * [Market Risk Capital Requirement + Operational Risk Capital Requirement] + Sum of Risk Weighted Assets compiled for Credit Risk.

The New Accord puts forward two alternative options for the risk-weighting of banks. The first would be linked to the weighting attributed to the country in which the bank is incorporated. The weight attributed to the bank would be one category less favourable than that applying to the country (Table 1; option 1). However, there would be a ceiling of 100 per cent on the weights for exposures to banks of all but the lowest rated countries, for which the ceiling would be 150 per cent. The second option would involve recourse to external agencies own ratings of banks. Under this option, claims on banks with a rating of AA- or better would be assigned the lowest risk weight, which increases gradually as the sovereign rating of the country declines. Under this option (unlike the first), inter-bank claims would also be differentiated by their maturity, but the benchmark for such differentiation has been tightened from a residual maturity of upto 1 year (in the 1988 Accord) to an original maturity of upto 6 months (in the New Basel Capital Accord).

**Table 1: Risk-weights of the New Basel Capital Accord:
Exemplified with Standard and Poor's Rating**

Claim	AAA to AA-	A+ to A-	BBB+ to BBB-	BB+ to B-	Below B-	Unrated	
Sovereign	0	20	50	100	150	100	
Banks	Option 1 ^a	20	50	100	100	150	100
	Option 2 ^b	20	50	50	100	150	50 ^c
Corporates	20	100	100	100	150	100	

a: risk weighting based on risk weighting of sovereign in which the bank is incorporated

b: risk weighting based on the assessment of the individual bank

c: claims of a short original maturity less than six months on banks with a rating above BB+ would receive a weighting that is one category more favourable than the usual risk weight on the bank's claims subject to a floor of 20 per cent or the level of the risk weight applying to its country of incorporation.

Source: BIS (2001)

The weights in the new framework also provide for differentiation in the case of non-financial corporates to recognise variations in their credit quality. Illustratively, a weight of 20 per cent is attributed to entities with credit rating of AA- or better (subject to the proviso that no corporate should receive a weight lower than that of its country of incorporation); corporates with rating below B- would be

assigned 150 per cent risk weight. Other changes in the standardised approach concern the weights for off-balance sheet items and treatment of securitised assets.

The IRB Approach

The IRB framework for corporates, sovereign and bank exposures build on current best practice in credit risk measurement and management. While, the standardized approach is, in principle, close to the existing arrangement, under the IRB approach, banks will be allowed to use their internal estimates of borrowers' credit worthiness, subject to supervisory validation.⁶ Under the IRB approach, Banks will be required to classify banking book exposures into the six broad classes of assets which underlie different credit risk characteristics *viz.*, (a) Corporate, (b) Bank, (c) Sovereign, (d) Retail, (e) Project finance, and (f) Equity. For the first three types of exposures, the Committee has developed both foundation and advanced methodologies for the estimation of risk components (there is no distinction between foundation and advanced methodologist in the retail framework). For corporate, bank, sovereign, and retail risks, there is a specific set of risk weights. For each of these classifications, exposure risk weights are derived from the specific continuous foundation risk weighted asset is defined as the product of risk weight of transaction and a measure of exposure (Box 1).

Box I: Internal ratings-based approach

The approach of the new Accord to credit risk measurement represents a significant step forward in banking regulation because it combines practical applicability with a solid theoretical foundation. Given that the new methodology is suitable for implementation by banks of different sizes, business structures and risk profiles, a common approach to modelling credit risk across all types of bank is available for regulatory purposes for the first time. The internal ratings-based approach (IRB) is closely linked to key results of modern asset pricing theory. Its methodology is based on a model which establishes the likelihood of a borrowing company being unable to repay its debt, as determined by the difference between the value of its assets and the nominal value of its debt. The value of the firm's assets is modelled as a variable which changes over time, in part as a result of the impact of random shocks. Default

⁶ There are, however, some differences between the existing approach and the standardised approach proposed in the New Basel Accord. Under the standardised approach the risk-weights have been enlarged to encompass exposures to a broad group of borrowers with reference to rating provided by the rating agencies so as to take care of greater risk differentiation.

is assumed to occur when a firm's assets are insufficient to cover its debt. The corresponding measure of credit risk within a certain time frame (commonly set at one year) is the probability of default (Gordy, 2003)

In the IRB approach, the required minimum capital is based on the distribution of losses due to default in a portfolio of loans or similar instruments. The horizon of the risk assessment is set at one year. The IRB model further assumes a 99.9% confidence level. This means that once in a thousand years, the actual loss is expected to exceed the model's estimate. In addition, as a result of the agreement reached by the BCBS in January 2004, the IRB capital requirements cover only unexpected losses, i.e. losses which are not covered by provisions. The calculation of capital requirements for a loan's default risk under the new Accord relies on six components:

Probability of default (PD): estimate of the likelihood of the borrower defaulting on its obligations within a given horizon, e.g. one year.

Loss given default (LGD): loss on the loan following default on the part of the borrower, commonly expressed as a percentage of the debt's original nominal value.

Exposure at default (EAD): nominal value of the borrower's debt.

Maturity of the loan.

Correlation to systematic risk: estimate of the link between the joint default of two separate borrowers. The IRB model relies on a single-factor asset value model to describe the co-movement of defaults in a portfolio. The unobservable common factor can be interpreted as a variable which represents the state of the economic cycle. IRB correlations to the single systematic risk factor are a function of the firm's size and credit quality in accordance with the BCBS framework.

Risk weight function: function relating the loss forecast to minimum capital requirements;

The new Accord recognizes the importance of asset type in explaining the risk profile of instruments subject to default risk and therefore distinguishes between corporate loans, commercial real estate financing and the retail portfolio. The model assumes very low concentration in the loan portfolio and that an individual borrower's default risk does not depend on the composition of the entire portfolio. This characteristic of the IRB considerably reduces the complexity of the approach and also allows smaller, less sophisticated banks to apply a modern risk management concept.

Source: *ECB Bulletin*, January 2005

Supervisory Review Process

The second pillar of the New Basel Accord focuses on improving the supervisory review process and views the role of supervisory review as a critical complement to capital requirement and market discipline. It emphasises that, despite

improving the risk sensitivity of the minimum capital requirements, supervisors need to take a comprehensive view on how banks handle their risk management and internal capital allocation process. Subject to shortcomings in these, supervisors could require higher than the minimum capital target from a given institution.

The discussion is concerned primarily with the application of the following four principles: (a) supervisors expect banks to operate above the minimum regulatory capital ratios and should be able to require banks to hold capital in excess of the minimum; (b) a bank should have a process for assessing its overall capital adequacy in relation to its risk profile, as well as a strategy for maintaining its capital levels; (c) supervisors should review and evaluate a bank's internal capital adequacy assessment and strategy, as well as its compliance with regulatory capital ratios; and (d) supervisors should seek to intervene at an early stage to prevent capital from falling below prudent levels.

Market Discipline

The potential of market discipline to reinforce capital regulation depends on the disclosure of reliable and timely information with a view to enabling banks counterparties to make well-founded risk assessments. An important rationale behind this pillar is to provide adequate information to enable the user to assess whether the available capital is sufficient to meet measured and non-measured risks. To the extent that such disclosures are comprehensive and objective, it is expected to assist market participants in judging how a bank's management of its capital adequacy relates to its other risk management process and its ability to withstand future volatility. The BIS has recently elaborated the recommendations of the New Basel Capital Accord concerning the nature of information which should be disclosed under this pillar. Salient among these include (i) the structure and components of bank capital, (ii) the terms and main features of its capital instruments, (iii) the accounting policies used in the valuation of assets and liabilities and for provisioning and income recognition, (iv) qualitative and quantitative information about its risk exposures and its strategies for risk management, (v) its capital ratio and other data related to its capital adequacy on a consolidated basis, and

(vi) a breakdown of its risk exposures. The information needs to be supplemented by an analysis of factors affecting the banks' capital position. Moreover, banks are encouraged to disclose ways in which they allocate capital among their different activities. The disclosures envisaged under this pillar need to be made on a semi-annual basis.

The Third Consultative Document

In the light of the comments received on the second consultative paper, the BIS issued the Third Consultative Document in April 2003. As compared to the Second Consultative document, the salient differences in the revised document pertain to, among others, applicability of advanced and foundation IRB approaches for commercial real estate lending, alternative approach to operational risk and lowering of risk weights on lending that is fully secured by mortgages on residential property.

What are the salient features of the third consultative document? As far as the Pillar 1 is concerned it was mentioned that at national discretion, banks will be able to risk weight all corporate claims at 100 per cent without regard to external ratings. There is a new section on the treatment of past due loans (other than mortgages). Risk weights 150 per cent or 100 per cent was added dependent on whether specific provisions cover more or less than 20 per cent of outstanding loans. Furthermore, it was pointed out that a credit conversion factor of 100 per cent would be applied to the lending of banks' securities or the posting of securities as collateral by banks, including repo. Besides, back-testing requirements for use of VaR are set out and PD floor of 0.03 per cent introduced for retail PD. Finally, it was pointed out that At national discretion, a bank can use an Alternative Standardised Approach (footnote 91 of BIS, 2003). For the retail and commercial banking business lines, the regulators are proposing an index other than Gross Income.

In case of Supervisory Review Process also, a new section has been added identifying important issues that banks and supervisors should particularly focus on. It was mentioned that a bank should ensure that it has sufficient capital to meet Pillar 1 requirements and the results of Pillar 1 stress tests. Supervisors were allowed to: (a)

assess banks' application of the reference definition of default and its impact on capital requirements, (b) increase the capital required-to prevent "cherry picking" (where the poorer quality assets and most of the credit risk of the underlying exposures remains with the bank).

As far as market discipline is concerned the Committee observed that considerable efforts have been made to ensure that the disclosure requirements of the New Basel Capital Accord focus on capital adequacy, and do not conflict with broader accounting disclosure standards with which banks need to comply.

3. Implications of the New Basel Capital Accord

3.1 Possible Implications for Emerging Market Economies

What is the likely impact of the New Basel Capital Accord on developing and /or emerging markets?⁷ One of main arguments about the effect of the Basel Accord II on the developing and / or emerging market economies rests on the postulate that the bulk of the borrowers in these countries fall under the speculative grade. In particular, it has been argued that speculative-grade borrowers will suffer from a dramatic rise in debt costs and heightened cyclicity of global bank credit as a result of The New Basel Capital Accord (Reisen, 2001). If the 'internal ratings-based' approach suggested is implemented, then there will be a substantial rise in risk weights. By contrast, the 'standardised' approach, which links risk weights to ratings by eligible external credit assessment institutions, would leave banks' regulatory capital charges, risk-adjusted returns and hence required spreads largely unchanged (except for the very lowest rating notches). Thus, to the extent it increases the capital requirement of the banks, it might have adverse repercussions on the credit portfolios of the banking sector.⁸

From a developing country perspective, the OECD / non-OECD distinction in risk-weights in Basel I is somewhat arbitrary and provides a distorting incentive for developing countries to seek OECD membership (Griffith-Jones and Spratt,

⁷ See Nachane *et al.* (2005), Ray (2001) and Ward (2002) for a discussion on the issues relating to implications of Basel Accord for the developing countries.

⁸ It has also been argued that the new Accord will raise the volatility of private capital flows to speculative-grade developing countries, and hence their vulnerability to currency crises (Griffith-Jones and Spratt, 2001).

2001). Most importantly, the lower (20 per cent) risk-weights attached to short-term loans for emerging markets created a bias in their favour; on the other hand, credit to non-OECD banks with over one year maturity was discouraged by a far higher (100 per cent) risk weight. The removal of the OECD/non-OECD distinction under the New Basel Capital Accord is likely to have negative consequences for lowly-rated OECD countries. Countries like Mexico, may find that the conditions attached to loans more closely reflect their actual rating rather than the fact of their OECD membership. Conversely, highly rated non-OECD countries (such as Chile) are likely to benefit from more favourable terms. Thus, the alterations to the current treatment of maturity should remove some of the incentives towards short-term lending to banks rated below AA-. Consequently, it might lengthen the aggregate maturity of such lending. Overall, however, as a result of the New Basel Capital Accord capital requirements could align better with actual risk. This could benefit the highly rated sovereigns, banks and corporates regardless of OECD membership.

Developing countries have high concentration of lower rated borrowers. The calibration of IRB has lesser incentives to lend to such borrowers. This, along with withdrawal of uniform risk weight of 0% on sovereign claims may result in overall reduction in lending by internationally active banks in developing countries and increase their cost of borrowing.

One of the major critiques of the New Basel Accord is perhaps the adoption of internal rating based (IRB) system. Two allegations are made in particular. First, that the application of IRB is costly and discriminates against the smaller banks, and secondly, that it will exacerbate cyclical fluctuations.

Theoretical models have demonstrated that if the bank is capital constrained, then the New Basel Capital Accord will intensify the difference in bank lending rates and in bank loans between corporate borrowers with different probabilities of default (Chen, 2002) or make the entire banking system worse off, if all of them attempt to raise capital *simultaneously* from the capital market (Hellmann *et. al*, 2001). This is especially so in case such markets are not sufficiently deep and liquid, which is more often the case in developing economies.

Discrimination against the Smaller Banks

A major impact of the New Accord could be an increase in the quantity of loans to borrowers rated above BBB and a fall in loans to borrowers rated below BBB (Griffith-Jones and Spratt, 2001). Given that the majority of the latter kind of borrowers are likely to be in the developed world, one major impact on the developing world will be a reduction in overall levels of lending from internationally active banks. What lending does occur is therefore likely to be concentrated in highly rated sovereigns, corporates and banks. In fact, as pointed out in Jackson (2001), for any bank, the effect of the internal ratings approach on required capital will depend on the risk profile of its particular book - high risk books will demand more capital than allotted currently and low risk books less (see, for instance, Nachane et al., 2005).

Pro-cyclicality

One of the most significant charges leveled against the New proposals is that they will exacerbate pro-cyclicality in their lending since the substantially increased provisions which can result from deteriorations in loan quality in cyclical downturns can lead to greater restrictiveness regarding New lending (European Central Bank, 2001; Ghosh and Nachane, 2003). In the case of an economic downswing if capital requirement becomes a constraint, then the bank may shrink its credit disbursement in an excessive way. Thus, it may exacerbate the recession / economic slowdown *via* the Fisherian debt-deflation spiral. Another important potential source of more pro-cyclical bank lending which might result from the New Accord is the reliance on credit rating agencies in setting risk weights under the standardised approach to credit risk. This is one of the reservations expressed about reliance on credit rating agencies. Others concern the limited coverage of the ratings of existing agencies, the difficulty in establishing guidelines that would assure high quality of rating agencies and the closely related problem of incentives provided by the New Basel Capital Accord for the proliferation of new agencies and the likelihood of use of unsolicited credit ratings.

Furthermore, when the risk-profiles of the lenders are assessed on the basis of an internal rating, the elements of pro-cyclicality are going to be higher still. In

fact, Danielsson *et al* (2001) has interpreted this pro-cyclicality of regulation as an inherent conflict between regulation and macro-economic stabilization.

Such elements of pro-cyclicality are inherent even in the existing Accord. There is however, the fear that greater risk sensitivity under New Basel Accord will aggravate this tendency. The drive for risk-weights to more accurately reflect PD is inherently pro-cyclical in that, during an upturn, average PD will fall - and thus incentives to lend will increase. Conversely, during a downturn, average PD will increase and, as a consequence, a credit crunch may develop with all but the most highly rated borrowers facing difficulty in attracting funds. The Basel Committee has recognised this concern, but argued that it would be outweighed by the benefits of a risk-sensitive capital framework. A strong piece of evidence against procyclicality comes from the European Central Bank. Employing a hypothetical portfolio of loans to 6,000 large, non-financial EU firms covering a long time span stretching from 1992-2004 revealed two important observations. First, banks' regulatory capital requirements under the IRB approach remain below the stipulated 8% for the hypothetical portfolio. And importantly, the new Accord will dampen pro-cyclicality features if the IRB is **implemented as envisaged**.

Impact on International Capital Flows

A basic aim of the New Basel Capital Accord is to ensure that the regulatory capital of the international banks should be in alignment with the credit quality of their loan portfolio. Thus, for lending to low quality borrowers capital charges are likely to be higher. This had led some commentators to argue that the resultant risk sensitivity would lead to a curtailment of supply of capital to emerging economies.

There are two channels through which The New Basel Capital Accord could affect the supply of capital to the emerging markets, (a) cross-border flows to such markets, and (b) credit flows within such markets. As far as the cross-border flows are concerned, because of the withering away of the distinction between OECD and non-OECD countries, it is clear that the regulatory capital for low-rated OECD

countries (like Turkey) would rise (Hayes and Saporta, 2002). Similarly, the average regulatory minimum to low credit quality countries is also likely to go up. If such additional regulatory requirement imposes a capital constraint higher than the economic capital of the banks, then the credit flows to the emerging markets could be affected adversely. As far as the credit flows within emerging markets are concerned, if most of banks of the emerging markets adopt the standardized approach, it would be unaffected.

How far do these conjectures get translated in terms of calculations of credit risk? While both Reisen (2001) and Griffiths Jones and Spratt (2001) predict dramatic increases in spreads for the low-rated countries, Weder and Wedow (2002) found that such increases in spreads is found to be rather low. Using the November (2001) version of The New Basel Capital Accord, and the S&P rating as of December 2001, the capital requirement for India is found to be unaltered at 8 per cent under both Basel I and the New Basel Capital Accord (standardized approach). The requirement under IRB approach (using a one year PD) was, in fact, found to be lower at 6.15 per cent! While the scenario for India is found to be reasonably bright, for countries like Venezuela or Russia the difference in the capital requirement between the standardized approach and the IRB approach is rather large.

While this may not have any immediate concern for India, it is a fact that the credit flows do become more sensitive to the external credit ratings. In is in this context, that the comment of the RBI about the undesirability of unsolicited external credit agencies needs to be taken all the more seriously, so that international capital flows via the banking channels are not subjected to the vagaries of international rating arbitrage.

3.2 Implications for India

The New Basel Capital Accord has evoked diverse reactions from various groups of economies.⁹ As far as India's reactions are concerned, the Reserve Bank of India (RBI), in its comments on the *Second Consultative Document*, pointed out that The New Basel Capital Accord would involve a shift in direct supervisory focus away to

⁹ See Nachane et al (2005) for a discussion on the reaction of developing countries to the new Accord.

the implementation issues, and that banks and the supervisors would be required to invest large resources in upgrading their technology and human resources to meet the minimum standards. It came down rather heavily on the increasing reliance on external rating agencies in the regulatory process on the ground that such a move would undermine the initiative of banks in enhancing their risk management policies and practices and internal control systems. It found that the minimum standards for the Internal Rating Based (IRB) foundation approach to be complex and beyond the reach of many banks. Further, while the Basel Committee desires neither to produce a net increase nor a net decrease in minimum regulatory capital, it is felt that the current proposals are going to result in significant increase in the capital charge for banks, especially in emerging markets. The emerging markets with their low technical skills, structural rigidities and less robust legal system, etc. would face serious implementation challenges. RBI felt that that the spirit of flexibility, universal applicability and discretion to national supervisors, consistent with the macro economic conditions specific to emerging markets ought to be preserved while finalizing the New Accord”.

While the Reserve Bank agreed with the view that the focus of The New Basel Capital Accord might be primarily on internationally active banks, it contended that after a period of time, all “significant” banks would be expected to adhere to it. It was, however, pointed out that the standardized approach might not suit the needs of the smaller banks. As a consequence, it suggested a simplified standardised approach for those banks that are not internationally active. Under this approach, standardized risk weights in the range of 0 per cent to 150 per cent on the basis of internal ratings of banks, could be assigned, subject to mapping of such ratings with the benchmark probability of default (PD) estimated by the supervisor on the basis of pooled data from select banks.¹⁰ The RBI recognized that even this simplified

¹⁰ As a precursor, the RBI pointed out that internal rating systems of banks need to be substantially upgraded and strengthened, keeping in view the best practices and the standards prescribed by the Basel Committee for the IRB approach.

approach is likely to be more extensive and complex than the 1988 Accord, and hence the New Accord may be applied, in phases.¹¹

As far as the ambit of “internationally active banks” is concerned, RBI defined these as banks with cross-boarder business exceeding 20 or 25 per cent of their total business (RBI, 2003). ‘Significant banks’, on the other hand, have been defined as those banks with complex structures and whose market share in the total assets of the domestic banking system exceeds 1 per cent.

A basic point of difference between The New Basel Capital Accord and RBI lies in the relative role of supervisors *vis-à-vis* external rating agencies. The RBI in its comment categorically reiterated that the External Credit Assessment Institutions should not be assigned the direct responsibility for risk assessment of banking book assets. This was primarily to avoid the contagion effect in the eventuality of a financial crisis and the proprietary information that domestic rating agencies have regarding their domestic clients. Furthermore, RBI pointed out that unsolicited ratings by external agencies are generally superficial, and could lead to a potential trade-off between competition and quality in the rating industry. Consequently, it favoured the view that preferential risk weights should be assigned only on the basis of solicited ratings.

In a similar spirit, RBI pointed out that the risk weighting of the banks should be de-linked from the credit rating of the sovereign in which these banks are incorporated. After all, country risk and firm-specific risks could be independent. A related issue is the assigning of weights to sovereign claims. The RBI felt that the national supervisors should be given some discretion to assign lower risk weight in specific cases.

RBI proposed that while internationally active banks may be required to follow the IRB approach, a simplified standardized approach may be evolved for other banks, whereby standardized risk weights in the range of 20 per cent to 150 per cent could be assigned on the basis of internal ratings of banks.

¹¹ Over the last several years, the Monetary and Credit Policy statements announced bi-annually by the Governor have been continuously sensitizing banks on the need to upgrade and improve their risk management and control systems in the move towards the new Accord.

As far as the Internal Rating Based (IRB) approach is concerned, it was argued that the minimum standards set for the same are complex and beyond the reach of many banks. Instead, it suggested that a simplified standardized approach above might be evolved and applied to banks that are not internationally active. These banks may be allowed to use internal ratings for assigning preferential risk weights, on certain types of exposures, after validation of the internal ratings systems by national supervisors. In particular, it noted that the line of demarcation between the six broad classes of exposures (*viz.*, corporate, sovereigns, banks, retail, project finance and equity) could often be quite indistinct. Therefore, without recognising the institutional framework and geographical spreads such segregation could pose serious implementation problems. Furthermore, the RBI felt that national supervisors might have discretion and flexibility in defining the exposure classes, *viz.*, corporate, retail, sovereign, project finance, etc.

In sum, unless suitably modified, the adoption of the New Basel Capital Accord in its present format would result in a significant increase in the capital charge for banks, especially in emerging markets. Besides, The New Basel Capital Accord could enhance the minimum regulatory capital, especially for banks in the developing economies, due to a number of reasons like, (a) withdrawal of uniform risk weight of 0 per cent on all sovereign claims (OECD & non-OECD), (b) explicit capital charge, or (c) imposition of higher risk weights on claims on certain high-risk exposures like venture capital or private equity.

Some recent developments in the run up to the New Basel Capital Accord deserve mention in this context. Subsequent to the publication of the compliance status with the *Basel Core Principles*, the RBI has taken several steps to implement certain important components of Basel Capital Accord. Illustratively, the Risk Based Supervision (RBS) process was effected from April 2003. With a view to assisting banks in setting up appropriate risk management framework, guidelines on credit risk management, market risk management and risk based internal audit were issued. In response to requests made by banks, the Risk Profile Template (RPT) for use in commercial banks was forwarded to them. Side by side, guidelines on country risk management and provisioning have been issued to banks. These guidelines require

banks to formulate appropriate, well-documented and clearly defined Country Risk Management (CRM) policies, with the approval of the respective Boards and address the issues of identifying, measuring, monitoring and controlling country exposure risks. In tandem with these developments, the Third Pillar of Basel Capital Accord is being bolstered by broadening the range of disclosures that banks have to disclose as part of 'Notes on Accounts' to their balance sheet.

With a view to ensuring migration to the new Accord in a non-disruptive manner, the Reserve Bank has adopted a consultative approach. A Steering Committee comprising of senior officials from 14 banks (private, public and foreign) has been constituted where Indian Banks' Association is also represented. Keeping in view the Reserve Bank's goal to have consistency and harmony with international standards it has been decided that at a minimum, all banks in India will adopt Standardized Approach for credit risk and Basic Indicator Approach for operational risk with effect from March 31, 2007. After adequate skills are developed, both in banks and at supervisory levels, some banks may be allowed to migrate to IRB Approach after obtaining the specific approval of Reserve Bank. The RBI has released Draft Guidelines for implementation of the New Capital Adequacy Framework on February 15, 2005.

What are the implications for the New Capital Accord for India? Following Leeladhar (2005) one may discern the following broad implications.

First, there is a strong possibility that the new Accord will lead to increased capital requirement in all banks across the board. Although capital requirement for credit risk may go down due to adoption of more risk sensitive models - such advantage will be more than offset by additional capital charge for operational risk and increased capital requirement for market risk. This could have profound implications for consolidation in the banking industry.

Second, competition among banks for highly rated corporates needing lower amount of capital may exert pressure on interest spread. Further, huge implementation cost may also influence profitability for smaller banks adversely.

Third, the level of rating penetration in India is still very low.¹² Furthermore, rating being a lagging indicator of the credit risk, the agencies often have poor track record. There is a possibility of rating blackmail through unsolicited rating. Moreover rating in India is restricted to issues and not issuers. Rating of issuers would be a challenge in India for years to come.

Fourth, competitive advantage of IRB approach may lead to domination of this approach among big banks. Banks adopting IRB approach will be more sensitive than those adopting standardized approach. This may result in high-risk assets flowing to banks on standardized approach, as they would require lesser capital for these assets than banks on IRB approach. Leeladhar (2005) rightly observed, “It is to be considered whether in our quest for perfect standards, we have lost the only universally accepted standard”.

Fifth, absence of historical database is going to be an obstacle for computation of probability of default, loss given default, migration mapping and supervisory validation require creation of historical database, which is a time consuming process and may require initial support from the supervisor.

Sixth, in case of unrated sovereigns, banks and corporates, the prescribed risk weight is 100%, whereas in case of those entities with lowest rating, the risk weight is 150%. This may create incentive for the category of counterparties, which anticipate lower rating to remain unrated.

Seventh, the New Basel Accord is going to have implications for corporate Governance Issues. The proposals of the new Accord underscore the interaction between sound risk management practices and corporate good governance. The bank’s board of directors has the responsibility for setting the basic tolerance levels for various types of risk. It should also ensure that management establishes a framework for assessing the risks, develop a system to relate risk to the bank’s capital levels and establish a method for monitoring compliance with internal policies.

Eighth, the new Capital Accord may turn out to be disadvantage for Smaller Banks. For its complexity, implementation of the new Accord calls for revamping

¹² Leeladhar (2005) reported a study revealing that in 1999, out of 9640 borrowers enjoying fund-based working capital facilities from banks, only 300 were rated by major agencies.

the entire management information system and allocation of substantial resources. Therefore, it may be out of reach for many smaller banks.¹³

Ninth, The new Basel Capital Accord may create a rift between external and internal auditors. The working Group set up by the Basel Committee to look into implementational issues observed that supervisors may wish to involve third parties, such a external auditors, internal auditors and consultants to assist them in carrying out some of the duties under the new Accord. The precondition is that there should be a suitably developed national accounting and auditing standards and framework, which are in line with the best international practices. A minimum qualifying criteria for firms should be those that have a dedicated financial services or banking division that is properly researched and have proven ability to respond to training and upgrades required of its own staff to complete the tasks adequately. With the implementation of the new framework, internal auditors may become increasingly involved in various processes, including validation and of the accuracy of the data inputs, review of activities performed by credit functions and assessment of a bank's capital assessment process.

In the light of the above, the question remains: what are the regulatory and supervisory challenges envisaged by the RBI in the implementation of the new Accord. Udeshi (2004) sums up the position as under:

- India has three established rating agencies in which leading international credit rating agencies are stakeholders and also extend technical support. However, the level of rating penetration is not very significant as, so far, ratings are restricted to issues and not issuers. While the new Accord provides some scope to extend the rating of issues to issuers, this would only be an approximation and it would be necessary for the system to move to ratings of issuers. Encouraging ratings of issuers would be a challenge.
- The new Accord provides scope for the supervisor to prescribe higher than the minimum capital levels for banks for, among others, interest rate risk in the

¹³ As Moody's Investors Services puts it, "It is unlikely that these banks will have the financial resources, intellectual capital, skills and large scale commitment that larger competitors have to build sophisticated systems to allocate regulatory capital optimally for both credit and operational risks."

banking book and concentration of risks / risk exposures. As already stated, we in India have initiated supervisory capacity building to identify slackness and to assess / quantify the extent of additional capital which may be required to be maintained by such banks. The magnitude of this task to be completed by December 2006, when we in India have as many as 100 banks, is daunting.

- Cross border issues have been dealt with by the Basel Committee on Banking Supervision recently. But, in India, foreign banks are statutorily required to maintain local capital and the following issues would therefore, require to be resolved.

- Whether the internal models approved by their head offices and home country supervisor adopted by the Indian branches of foreign banks need to be validated again by the Reserve Bank or whether the validation by the home country supervisor would be considered adequate?
- Whether the data history maintained and used by the bank should be distinct for the Indian branches compared to the global data maintained and used by the head office?
- Whether capital for operational risk should be maintained separately for the Indian branches in India or whether it may be maintained abroad at head office?
- Whether these banks can be mandated to maintain capital as per SA / BIA approaches in India irrespective of the approaches adopted by the head office?

The new Accord could actually imply that the minimum requirements could become pro-cyclical. No doubt prudent risk management policies and Pillars II and III would help in overall stability. We feel that it would be preferable to have consistent prudential norms in good and bad times rather than calibrate prudential norms to counter pro-cyclicality.

The existence of large and complex financial conglomerates could potentially pose a systemic risk and it would be necessary to put in place supervisory policies to address this.

In the event of some banks adopting IRB Approach, while other banks adopt Standardised Approach, the following profiles may emerge:

- Banks adopting IRB Approach will be much more risk sensitive than the banks on Standardised Approach, since even a small change in degree of risk might translate into a large impact on additional capital requirement for the IRB banks. Hence IRB banks could avoid assuming high risk exposures. Since banks adopting Standardised Approach are not equally risk sensitive and since the relative capital requirement would be less for the same exposure, the banks on Standardised Approach could be inclined to assume exposures to high risk clients, which were not financed by IRB banks. As a result, high risk assets could flow towards banks on Standardised Approach which need to maintain lower capital on these assets than the banks on IRB Approach.
- Similarly, low risk assets would tend to get concentrated with IRB banks which need to maintain lower capital on these assets than the Standardised Approach banks.
- Hence, system as a whole may maintain lower capital than warranted.
- Due to concentration of higher risks, Standardised Approach banks can become vulnerable at times of economic downturns.

4. Capital Adequacy and Bank Behaviour: An Empirical Exercise

Absence of historical data does not allow us to have full-fledged quantitative impact of the new Capital Accord on India. Nevertheless, with a view to assess the impact of capital requirements on the Indian banking system, we develop an econometric model in this section. Before embarking on the empirical model, we provide some evidence as regards the behaviour of capital ratios and their asset profile over the sample period. The average capitalisation position of state-owned banks over the sample period increased from 8.72 per cent to 13.20 per cent with a concomitant lowering in the number of banks not complying with the stipulated ratios (RBI, 2004). The asset profile of state-owned banks reveals that the growth in loans virtually coincided with the growth in asset with investments witnessing a higher growth rate over the sample period (Table 2).

Table 2: Asset Profile and Capitalisation of Public Banks-1996 to 2004

Variables	Total Assets	Loans	Investments	(Amount in Rs. crore)	
				of which Government Securities	Overall CRAR (%)
1995-96	5,05,845	2,07,539	1,62,667	1,12,705 (69.3)	8.72
1996-97	5,56,261	2,20,251	1,91,055	1,34,550 (70.4)	10.00
1997-98	6,49,186	2,59,903	2,27,103	1,55,772 (68.6)	11.53
1998-99	7,70,321	2,97,350	2,76,802	1,91,150 (69.1)	11.20
1999-00	8,90,952	3,52,109	3,33,414	2,37,825 (71.3)	10.66
2000-01	1,029,770	4,14,628	3,94,107	2,92,178 (74.1)	11.20
2001-02	1,155,737	4,80,680	4,54,008	3,44,690 (75.9)	11.80
2002-03	1,285,411	5,48,436	5,45,636	4,32,243 (79.2)	12.3
2003-04	1,471,428	6,32,740	6,25,678	5,10,232 (81.5)	13.2
<i>Average Growth (%)*</i>	<i>5.96</i>	<i>6.24</i>	<i>7.59</i>	<i>8.54</i>	

Stipulated CRAR was a minimum of 8 per cent upto end-March 1999 and 9 per cent, effective end-March 2000.

Figures in brackets indicate percentage to investments.

*Compound growth rate over the sample period

It can also be observed from the table that of the two major components of assets, *viz.*, loans and investments, while loans have grown in tandem with asset growth, investments, and in particular, investments in Government securities has far outpaced overall asset growth with a consequent rise in its share in total investments over the period.

The Model

Building on the work of Dietrich and James (1983) and earlier models and extending these to reflect recent capital adequacy developments, the following capital augmentation equation has been estimated:

$$dK_t/K_t = f(RoE, PK, LQ, KR, IRR, NPL, MQ, OBS) \quad (1)$$

where,

- dK_t/K_t = Percentage growth in bank capital in a given year t ;
- RoE = Return on bank equity (proxy for the return on bank capital);
- PK_t = Ratio of government securities to total assets (measure of portfolio risk);
- LQ_t = Ratio of banks' cash in hand plus balances with RBI to total assets (liquidity indicator);
- KR_t = Basel (1988) type RAR of actual bank capital to computed regulatory required capital (measure of bank CAR compliance);

- IRR_t = Ratio of interest sensitive assets to interest sensitive liabilities (measure of interest rate risk);¹⁴
- NPL_t = Ratio of gross non-performing loans to gross advances (measure of credit risk);
- MQ_t = Ratio of bank's earning assets (i.e., loans plus marked to market portion of investments) to total assets (measure of bank's managerial quality);
- OBS_t = Ratio of off-balance sheet business to total assets (proxy for innovation by management);

The dependent variable (dK/K) and the largest group of independent variables (RoE, PK, LQ, KR and NPL) are similar to those employed by previous researchers.

The first bank-specific characteristic focuses on changes in capital determined by its cost. The *cost of capital* is measured by the return on equity (RoE). According to theory, higher the cost of capital, the more expensive capital augmentation and *ceteris paribus*, the lower the change in CAR. One potential problem is the possibility of a different relationship between RoE and capital augmentation. Berger (1995), in a different setting, argues that either a positive or negative relationship between RoE and the bank's capital-asset ratio (and, therefore, presumably, capital augmentation) can be defended on *a priori* grounds.

PK is a proxy for bank portfolio diversification risk; which is expected to be negatively related to changes in capital: the lower a bank's portfolio risk (i.e., higher PK), the less is the need to augment capital.

LQ is a liquidity variable; although Mayne (1972) employed a similar control variable; other researchers like Mingo (1975) and Dietrich and James (1983) did not. In essence, LQ is another key banking risk not factored explicitly into the regulatory capital adequacy formula. Intuitively, LQ is expected to be negatively related to changes in capital: the more liquid ((i.e., higher LQ) the bank, the lower the need to augment capital.

¹⁴ This variable has been calculated as [(1-proportion of non performing loans)*Loans/Deposits]. Investment portfolio, which is subject to a market risk, has been ignored in the calculations.

The relationship between KR and dK is the primary focus of the study. KR is the ratio of a bank's actual capital adequacy in each year to the regulatory prescribed capital ratio. In other words, KR is constructed as a close approximation to the Basel-type RAR formula: it corresponds closely to Peltzman (1970) specification. If regulation is effective, the expected sign of KR is positive.¹⁵

NPL is an accounting measure of credit risk. It can be argued that a bank with a high NPL will be incentivised to improve its capital augmentation, since downside credit risk potential (i.e., unforeseeable and unforeseen credit losses) may be correlated with a high NPL. As a consequence, the NPL variable can be expected to be positively related to changes in capital augmentation changes.

The next group of independent variables (IRR, MQ and OBS) are additional control variables employed within the current exercise. IRR is a rough measure of a bank's interest rate gap and is expected to be positively related to capital augmentation. The higher IRR, the greater the incentive for a bank to increase its capital.

MQ is a proxy for the managerial quality of the bank: higher the MQ, the better is bank management's assumed quality (i.e., managerial skills) since management is able to operate with a higher level of earning assets. The better these managerial skills, the lower is the assumed pressure to augment capital; consequently, MQ is expected to have a negative sign.

OBS proxies for management's innovation skills; higher the OBS, the more innovatory the management is assumed to be. As with managerial skills, the pressure for capital augmentation are assumed to be less pressing for a more innovative bank management, which would imply an expected negative sign for OBS.

In addition, the capital regulation was tightened in 2001. Illustratively, with effect from April 2000, banks had to comply with a revised (minimum) capital adequacy stipulation of 9 per cent, from the earlier 8 per cent. Accordingly, a dummy variable was inserted for the year 2001 (DUM_2001) to ascertain whether the

¹⁵ Dietrich and James (1983) defined the KR variable as a negative inverse in order to permit a non-linear response to regulatory pressure. We sidestep such complications for the present exercise.

tightening of capital adequacy norms had any impact on bank capital augmentation process.

Empirical Results

Table 3 reports the regression results; the panel results for the entire period is exhibited as Model 1. First, it is observed that capital augmentation increases significantly following a rise in the return on equity. This suggests that state-owned banks use profits partially to augment their capital, because the return on equity is not only a proxy for capital cost, but also for bank profitability and retained earnings can be used for capital augmentation. Second, the sign on LQ is positive and sign, suggesting that liquidity is not a constraint for state-owned banks.

Table 3: Fixed Effects Regression Results on Capital Augmentation

Variable	Model 1	Model 2	Model 3
Constant	41.33 (97.85)	39.67 (103.19)	-32.88 (104.56)
RoE	5.24 (2.34)**	5.30 (2.32)**	5.48 (2.33)*
PK	0.35 (1.27)	1.84 (1.42)	1.87 (1.42)
LQ	2.25 (1.17)**	2.24 (1.16)*	2.15 (1.119)***
KR	8.07 (4.29)***	5.46 (4.41)	5.53 (2.42)**
IRR	1.64 (1.12)	-0.65 (1.49)	-0.64 (1.49)
MQ	-2.13 (1.19)	-0.58 (1.36)	-0.64 (1.37)
OBS	0.67 (0.48)	0.42 (0.49)	0.43 (0.49)
NPL		2.77 (1.20)**	2.73 (1.21)**
DUM_CAR			-4.96 (11.45)
Adjusted R-square	0.16	0.17	0.18
Time period	1996-2004	1996-2004	1996-2004
Hausman test	60.5	58.3	50.2
H ₀ :RE vs FE			

Note: (1) Standard errors are in brackets.

(2) *, **, *** indicate significance at 1%, 5%, and 10%, respectively.

Of particular interest from the point of view of the present exercise is the sign on the KR variable, the proxy measure of bank capital adequacy compliance.

KR turned out to be significant at conventional levels, and it had its predicted sign over the sample period, supporting the efficacy of the regulatory process. When the model was augmented to include the non-performing loans as an additional explanatory variable (Model 2), this variable turned out to be significant, although the KR variable turned insignificant at conventional levels. Finally, in the fully expanded version of the model, when we incorporated the dummy variable (DUM_2001), KR turned out to be positive and statistically significant. These results support the view that CAR was effective. Regulatory pressure for improved capital adequacy is reflected in increased bank capital augmentation: the full panel results support this contention.

It needs to be observed that the aforesaid analysis has been conducted in terms of Basel-I- type approach. While it doesn't throw much light on the possible impact of the New Basel Capital Accord, it does highlight the importance of bank-specific factors in influencing capital ratios of banks and significance of regulatory compliance by banks. Judged thus, the analysis points to two important policy aspects. Firstly, capital ratios seem to have an influence on bank's decision-making. This fact assumes all the more relevance in view of the growing concerns about banking stability. Secondly, banks would need to rethink their strategy of investment banking, as had happened during some part of this period. These observations gain prominence in view of the fact that the economy seems to have entered a high growth trajectory, which would necessitate a higher demand for loans. Combining the two aforesaid points, it seems fair to state that the Indian evidence makes capital requirements an attractive regulatory instrument: enhancing regulatory compliance while serving to reinforce the stability of the banking system.

6. Emerging Concerns

Bank capital is directed at the risk of unexpected losses. In principle, all categories of banking risk that can lead to such losses needs to be covered by capital, and any of them, if left unattended, are capable of eroding the capital base of the institution. Those concerned with the management of banks are inevitably

confronted with the interrelationships among different categories of banking risks. Banks' internal controls reflect awareness of this and are designed to deal with the problems which these inter-linkages pose. Recent periods of financial turbulence have brought forth the connections between different categories of banking risks, in particular, between credit and market risks. These connections have been highlighted in academic as well as policy publications.

Not surprisingly, the efforts of major banks to upgrade their risk management function in response to the increased complexities of banking business are characterised by an increasingly integrated approach to risk management. While there are certain nitty-gritties that still need to be tackled as far as the robustness of these new methods and their ability to predict financial vulnerability are concerned, one might envision further improvements in this area in the near future. Moreover, in various forms, these methods are likely to spread from the larger, more sophisticated institutions to the less-complex rungs of the industry.

The increasingly heterogeneous banking sector with which the BIS is concerned is a source of growing difficulty for global standard-setting, since the objectives of the BIS include a reasonable measure of regulatory uniformity for the institutions covered and thus the reduction in differing competitive advantages accruing from differences in national regulatory regimes. Efforts at harmonisation of banking regulation and supervision have, therefore, been rendered overtly complex by the diverse range of practices in loan classification and provisioning, differences in the legal and institutional frameworks and the varied accounting standards and fiscal regimes to which banks are subject to in different countries. One basic duality is the broad division of the international banking system into those banks, which have been following such standards (and thus, those which conform to 'international best practice') and those that have only recently begun aspiring towards such standards. This duality has, in its wake, led to the call for development of differential standards for sophisticated and less sophisticated banks, for internationally active and domestically active banks and as a corollary, to banks in developed and developing/emerging/transition economies. Mention may be made that the forerunner of banking standards, the 1988 Accord made a distinction between internationally active banks and other banks, while the New Basel Capital Accord

speaks, in addition, of a class of sophisticated banks to which international standards could be applicable (Narain and Ghosh, 2002).

Second, the progressive shift in the nature of banking supervision away from reliance on relatively simple rules and procedures is placing greater demand on supervisors, and in particular, on quantitative skills. The trend is already widespread and likely to gain momentum in the near future. While not all countries will be affected uniformly by these changes, emerging markets with developing banking sectors are likely to be significantly affected, as supervisory skills begin to command a premium. This might engender a migration of supervisory resources to places where it receives the highest remuneration.

Does this mean that banks from developing countries are likely to be put at a further competitive disadvantage *vis-à-vis* large, internationally active banks from the industrialised world? Several commentators have been skeptical of the efficacy of the New Basel Capital Accord to strengthen banks in emerging countries (Rojas-Suarez, 2001; Ward, 2002). Their argument is based on the premise that such countries can be divided into two groups according to their capacity to enforce regulatory capital: (a) those with inappropriate accounting standards and reporting systems and (b) those with high concentration of asset ownership, that allows a degree of maneuverability for market-based financing. Under such circumstances, capital ratios cease to play their desired role since there exists no capital markets to validate the “real” value of capital, as distinct from its accounting value. However, it seems fair to say that an answer to this question at the present juncture can, at best, be tentative. First, the existing proposals of New Basel Accord are still in the process of being *actually* implemented: different countries might face different constraints in implementing them. Secondly, and more fundamentally, in so far as the proposals are applicable to internationally active banks and to the extent such banks are less dominant in developing country markets, developing countries and emerging markets are *possibly* likely to be less affected by the New Basel Capital Accord.

In India, the most important facet of risk, or for that matter, in most emerging markets, remain credit risk. Banks in India have typically had their operations centred on their branches. The system had historical appeal, given the wide branch network and the absence of technology networking. In the deregulated

environment, the system has become of limited relevance, since it squarely places the responsibility on the branch manager for both marketing (employer of capital) and credit functions (protector of capital), which could engender potential conflicts of interests. What is important is to ensure consistency of risk grading system across the entire organization and ensure that such policies are consistently applied across all geographical areas. The envisaged introduction of 'core banking' solutions would enable banks to segregate the credit sourcing (front office) and appraisal (back office) functions, which can, over time, build up expertise and monitor credit migrations on a bank-wide basis, a key factor behind the application of the new Accord (Nachane *et al*, 2005). The use of dynamic credit scoring models coupled with the full-fledged operationalisation of the credit bureau would enable banks to switch from traditional proprietary models to newer methods of credit evaluation to reflect the repayment and recovery experience across asset class, geographies and demographics. The improvements in the legal framework and the secular decline in distressed assets point to an improvement in the recovery climate, although it may be a while before the market for such distressed assets fully takes shape.

The Basel Committee has recently come out with the final version of the Document which provides the roadmap for countries seeking to align their regulatory capital with the revised standards.¹⁶ While the RBI has clarified its position on the new Accord, there is much work clearly ahead for banks, including evaluating their own readiness, training supervisory staff and more importantly, estimate their own abilities to identify, measure and manage their risks. A crucial feature of the new Accord is to enable banks to 'unbundle' different kinds of risks so that they can differentiate between, and manage separately, their exposures to credit, market and operational risks. It is, therefore, opportune that banks focus their attention on the role of capital, capital levels and targets and how they relate to strategic plans and objectives. Although the capitalisation position of Indian banks at end-March 2004 at 13 per cent was well above the stipulated minimum levels, clearly there is little headroom for complacency. Banks would also need to spend more time assessing their own risk profiles and evaluating the amount of capital they need to cope with

¹⁶ Basel Committee on Banking Supervision (2004), *International Convergence of Capital Measurement and Capital Standards: A Revised Framework*, June.

adverse outcomes in normal times and under reasonable stress scenarios. A Steering Committee has been constituted drawing upon members from banks, IBA and our own staff. The Steering Committee would constitute sub-groups which would provide inputs for preparing draft guidelines for implementation of Basel Capital Accord norms. Keeping in view the limited headroom available to banks to fund long-term projects, the RBI has recently allowed banks to raise long-term bonds for funding their long-term commitments.

Capital is the basic pillar of strength for banks against unforeseen losses. Recognising this, the Basel Committee has brought out a document that clearly serves to promote greater international convergence in capital standards as also incentivise banks to hold regulatory capital aligned closely with their economic capital. However, it needs to be recognised that banking regulation and supervision are extremely complex areas where the regulator has to tread a careful middle path between the *ex-cathedra* overzeal for intervention and a complacent belief in the ability of the banking system to self-rectify its deficiencies. As Caprio and Honohan (1999) remind us, in a recent contribution, 'bank regulation must be seen as a evolutionary struggle and regulatory innovation will remain a constant challenge'.

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