

The Revised Basel Capital Accord: The Logic, Content and Potential Impact for Developing Countries

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Abstract

Since capital is the last resort for protection against bank insolvency, regulatory capital requirements are one of the fundamental elements of banking supervision. Basel II is the modified framework of supervisory regulations governing capital adequacy for internationally active banks, published by the Basel Committee of Banking Supervision. This paper features the backdrop and logic, the structure and content, and the implications of the Revised Basel Capital Accord for banking sector stability as well as from the point of view of developing countries' financing needs.

Following the introductory section featuring the logic of capital adequacy standards, the second section of the paper presents the basic features of the original Basel I Accord. This is followed by a section discussing the problems of Basel I. The subsequent section examines the structural transformation of the banking sector and its basic features, and describes the background leading up to the revision of the Basel Framework. As in the case of Basel I, the section on Basel II starts by looking at its scope of application and the definition of regulatory capital, followed by the formulation of risk-weighting methodology for various asset classes for the different approaches under Pillar 1 namely, the Standardised Approach, the IRB Approach, etc. It then goes on to discuss the various new sections introduced in Basel II, such as Credit Risk Mitigation, Securitisation, Equity Exposure, Trading Book Issues, Supervisory Review under Pillar 2, Market Discipline under Pillar 3, etc.

While no country is legally obliged to implement Basel II domestically given that it is meant for only internationally active banks, the paper argues that the new Accord devised by G-10 countries may also become binding on non-G10 countries as in the case of Basel I, for a variety of reasons. These are that: the supervisory review under Pillar 2 is expected to complement the Core Principles for Effective Banking Supervision and thus also enters the IMF's Article IV surveillance; the fact that Basel II offers great flexibility under which banks could adopt a phased rollout of the IRB approach; and that internationally active banks operating in many developing countries would demand the homogenization of capital adequacy standards across their various host countries, etc. Thus, even as the Basel Committee has extended the transition period for implementation of the more advanced approaches for developing countries to the end of 2007, the implementation process will likely take on a momentum of its own. However, this drive towards implementation is in complete disregard of the serious issues that have been raised regarding the adverse implications of Basel II.

There is some broad agreement that the new rating system proposed in Basel II's Standardised approach addresses many of the concerns raised by developing countries about the 1988 Accord (such as the OECD/non-OECD distinction and the reduction in the incentive towards short-term lending) and aligns capital requirements more closely with actual risks. However, while the preferential risk weighting for domestic currency lending by international banks, funded also domestically, should prove beneficial in reducing foreign exchange risk and thus in preventing sudden capital outflows, the downside would be the increased competition for domestic savings between domestic and international banks. Further, the emphasis of the Standardised approach on credit ratings would also imply an increased difficulty in accessing bank financing for unrated corporations, especially for small- and medium-sized companies and poor countries, apart from leading to increased pro-cyclicality and circularity in lending.

The IRB approach is predicted to have more serious implications for many developing country borrowers. Several important concerns raised in this regard are discussed in-depth in the paper. These include: the impact of Basel II on the cost and level of borrowing for smaller and lower rated borrowers including developing countries (for a variety of reasons); the increase in pro-cyclicality of bank lending which the new approach will lead to; decline in banking sector competition; the lack of recognition of portfolio diversification effects that can have serious implications for international bank lending to developing countries, etc. These are in addition to general problems such as the high cost of compliance and implementation, the difficulty that market discipline under Pillar 3 may not work in the desired manner; etc.

In conclusion, the paper argues that while the pressures on developing countries for Basel II implementation will come from different quarters, the underlying thrust, as in all recent efforts towards global harmonisation and homogenisation of economic structures, will be the projection of Basel II as a global "best practice" whose adoption would enable countries to achieve financial stability in the globalised world. But, while Basel II is yet another attempt by the global financial community to remedy the woes associated with unhindered financial liberalization, it appears that apart from an increase in the cost of financing development implied by Basel II for a variety of reasons, ironically, new forms of regulatory biases and resultant systemic instabilities may be generated by its proposed implementation. This will exacerbate the existing conflicts between financial stability and economic growth objectives facing developing countries, with further adverse implications for their development prospects.

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Introduction

Since at least the 1970s, a number of international agreements have been worked out in an attempt to strengthen the international financial system comprising of financial institutions, financial markets and the payment and settlement systems. While financial institutions include banks, investment companies, insurance companies and others, since banks have been the dominant financial intermediaries, a substantial part of earlier as well as ongoing work with this intention has concentrated on banking supervision.

Since some borrowers may fail to honour their financial contracts, losses of interest and principal occur in the banking business all the time.¹ Although it is never possible for a bank to know in advance the exact level of losses it will suffer in a particular year from defaulting borrowers, it can forecast the average level of losses it can reasonably expect to experience. As this expected loss (EL) is considered a standard cost of doing their business, banks account for them through the variable pricing of loans (that is, by applying varying interest rates to different classes of borrowers) and by keeping aside reserves (provisioning) in anticipation of future loan write-offs. But, occasionally, enormous losses may occur that exceed expected levels, the timing and severity of which are unpredictable. Although the varying interest rates charged on credit exposures may absorb some proportion of unexpected losses (UL), banks will not be able to hike interest rates to levels that cover all unexpected losses.

Given that banks routinely mismatch the amounts of lending and borrowing, the terms of lending and borrowing and use loans (and increasingly other assets) as collateral for other loans, etc., when non-payment by a large borrower² or/and sharp changes in the prices of financial assets used for collateralizing loans lead to huge peaks in unexpected losses, there is a risk that they can undermine the solvency of banks. However, apart from this horizontal effect, default by

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¹ This risk of non-payment or default by a debtor is known as credit risk. Credit risk is differentiated from market risk or financial risk. The latter is broadly defined as the loss arising from the effect of general market conditions such as changes in the prices of assets like interest rates or exchange rates on the value of repayment.

² Defaults by a large group of even smaller borrowers simultaneously, as can happen in an economic downturn, could also have the same impact.

a bank can also precipitate runs on other banks and lead to large-scale withdrawal of deposits, due to banking linkages and contagion effect. Such a vertical (across banks) cascading effect would raise the probability of a sector-wide impact. The larger the bank, the larger would be the vertical impact and the systemic risk. Given the impact of this on the provision of credit as well as for the payments mechanism, problems in the banking sector tend to have a ripple effect across the economy, which could prove disruptive to the economy and therefore have adverse implications for public welfare.

It is because of these externalities that the banking sector has seen a variety of regulations relating to entry, location, activities in terms of sub-sectors permitted to enter (for instance, investment banking, insurance, etc.) and instruments allowed to use for borrowing and lending, pricing and balance sheet decisions, etc. In particular, regulations on capital adequacy have been formulated to ensure that banks maintain sufficient levels of capital reserves which could be used to hedge the risk of lending to borrowers with varying creditworthiness and repayment behaviour, and thus cover the gap between estimated and actual value of losses. In terms of the distinction made earlier between expected and unexpected losses facing a bank, capital provides protection against unexpected losses, while the role of provisions is that of providing cover against expected losses. Capital reserves enable banks facing defaults to spread losses over several years and allow them to maintain liquidity, thereby reducing the likelihood of their failures. Thus, apart from aligning the incentives of bank owners and managers with those of the uninsured claimants (the depositors and creditors of the bank), at the macro level capital standards aim at reducing bank insolvencies to safeguard a country's banking system, immunizing taxpayers in the event of bank insolvencies.³

The Backdrop to the Basel Accord

The Basel Committee on Banking Supervision, under the aegis of the Bank for International Settlements (BIS) with a mandate for promoting international monetary and financial cooperation between central bankers, has played the central role in developing capital standards for banks.⁴ The Basel Committee⁵ was established by the central bank governors of the Group of Ten countries⁶ in 1974 in the aftermath of serious disturbances in international currency and banking markets following the failure of the Franklin National Bank in New York and the Herstatt Bank in West Germany, which left many of these banks' counterparties in the foreign exchange market with significant losses. Both events demonstrated that the failure of even a

³ See Rojas-Suarez, 2001 and Raffler, 2006.

⁴ While the Basel Committee deals with banks, the co-ordination of the regulation of other major financial institutions is either carried out by other regulators (e.g. International Organisation of Securities Commissions or IOSCO for securities, and International Association of Insurance Supervisors or IAIS for insurance).

⁵ Henceforth, "the Committee" stands for the Basle Committee on Banking Supervision.

⁶ Currently, the Basel Committee on Banking Supervision consists of senior representatives of bank supervisory authorities and central banks from the G13 (Belgium, Canada, France, Germany, Italy, Japan, the Netherlands, Spain, Sweden, Switzerland, the United Kingdom, and the United States and Luxembourg). It usually meets at the Bank for International Settlements (BIS) in Basel, where its permanent Secretariat is located.

moderately-sized bank could have implications that went far beyond their national boundaries and the competence of national supervisory authorities. Armed thus with the recognition that banks with cross-border operations posed special problems, the two fundamental principles driving the Basel Committee's work since the 1975 Concordat⁷ have been that: no foreign banking establishment should escape supervision; and there should be consolidated supervision of international banking groups. The Basel Committee has thus been working to improve bank supervision at the international level ever since its creation.

However, it was only after the Mexican debt crisis of 1982 that concrete work on formulating capital adequacy standards began in earnest. In the early 1980s, the Committee became concerned that the capital ratios of the main international banks were deteriorating just at the time that international risks, notably those vis-à-vis heavily-indebted countries, were growing.⁸ This resulted in the 1987 Basel Committee guidelines for the measurement and assessment of the capital adequacy of banks operating internationally. A broad consensus emerged that there should be a weighted approach to the measurement of risk, on and off the balance sheet.

Thus the agreement, known as the Basel Capital Accord or Basel I,⁹ set the minimum regulatory capital for banks at 8% of the risk-weighted value of their assets. The accord's objectives have been to ensure the soundness and stability of the banking system and to achieve greater uniformity in capital standards across countries. It was intended that a standard approach applied to internationally active banks in different countries would reduce competitive inequalities between them. The framework was to be implemented by the BCBS member countries by end-1992.

Given that Basel II is a revision of the 1988 Accord, it is imperative to understand the basic features of Basel I.

Basic Features of Basel I

While banks operate under a varied range of risks such as credit risk, interest rate risk,¹⁰ exchange rate risk, liquidity risk,¹¹ operational risk,¹² legal risk,¹³ reputational risk,¹⁴ etc., the

⁷ The 1975 Basel Concordat is the document titled 'Principles for the Supervision of Banks' Foreign Establishments'.

⁸ Formal minimum capital requirements were adopted until then only by the UK and the USA.

⁹ BCBS, 1988.

¹⁰ Interest rate risk and exchange rate risk refer to the exposure of a bank's financial condition to adverse movements in interest rates and exchange rates respectively. Both come under the general category of market risks and impact the earnings of a bank.

¹¹ Liquidity risk arises from the inability of a bank to obtain sufficient funds, either by increasing its borrowing or by converting its assets, promptly and at a reasonable cost. In extreme cases, insufficient liquidity can lead to the insolvency of a bank.

¹² Operational risk refers to any of the numerous risks to which a bank is exposed directly as a result of being in business and is defined as the risk of loss resulting from inadequate or failed internal processes, people and systems or from external events. Operational risk event types include internal fraud, external fraud, employment practices and workplace safety, clients, products, and business practices, damage to physical assets, business disruption and system failures, execution, delivery and process management failures, etc. See BCBS (2003).

framework in Basel I is mainly directed towards assessing the capital requirements for protecting them against credit risk. Further, given that the Accord's intent has been to ensure the soundness of banks that engage in international lending and investment activities, a further aspect of credit risk namely, country transfer risk,¹⁵ is an integral component of Basel I's risk weighting scheme. For addressing country transfer risk, a defined group of countries of high credit standing was adopted as the benchmark for applying different risk weights, and this group was taken to be the OECD or countries which have concluded special lending arrangements with the IMF associated with the Fund's General Arrangements to Borrow.

The capital adequacy ratio (or CAR) is defined as the percentage of a bank's capital to its assets, with assets weighted according to their relative riskiness. The Accord addresses the different levels of credit risk inherent in banks' balance sheet and off-balance sheet activities. The idea is to assess the riskiness of each class of borrowers and to base capital requirement on this risk assessment, in order to dissuade banks from undertaking excessive risks. However, only five risk weights are used, namely, 0, 10, 20, 50 and 100%, and therefore, there are inevitably some broad-based judgements in deciding which risk weight should apply to the different categories of assets.

Regulatory capital, by definition, includes only those components of a bank's capital which are readily available to absorb any losses.¹⁶ Thus, Basel I defines regulatory capital in two tiers, in the order of their ready availability when the need arises. Core capital, or Tier 1, comprises of a bank's permanent shareholders' equity and published (or disclosed) reserves.¹⁷ This should make up at least 50% of a bank's total capital base. Tier 2 or supplementary capital consists of the other elements of capital, which will be admitted up to an amount equal to that of Tier 1. Tier 2 capital can include such capital components as undisclosed reserves,¹⁸ revaluation reserves,¹⁹ general provisions or general loan loss reserves,²⁰ hybrid debt capital instruments,²¹

¹³ Banks are subject to various forms of legal risk. This can include the risk that assets will turn out to be worthless or liabilities will turn out to be greater than expected because of inadequate or incorrect legal advice or documentation. It also covers uncertainties as to the enforceability and other legal aspects of contractual performance.

¹⁴ Reputational risk arises from poor performance, management failures, failure to comply with relevant laws and regulations, and scandals involving banks, etc. Reputational risk is particularly damaging for banks since the nature of their business requires maintaining the confidence of depositors, creditors and the general marketplace.

¹⁵ Country risk refers to the risks associated with the economic, social and political environments of the borrower's home country. There is also a component of country risk called "transfer risk", which arises when a borrower's obligation is not denominated in the local currency, which in turn leads to the risk that the currency of the obligation may become unavailable to the borrower regardless of its particular financial condition.

¹⁶ It is clear that in the case of equity capital, the investment is locked in even if insolvency occurs. However, a bank cannot rely on its debt capital to the same extent, given that under the contractual terms of most types of debt financing, debt service obligations will have to be met even in insolvency. See Cornford, 2005a.

¹⁷ Disclosed reserves are those that are created or maintained by funds from retained earnings or other surplus. Examples are share premiums, retained profit, general reserves, reserves required by law, etc.

¹⁸ Undisclosed reserves arise where a bank has made a profit, which is not included in its normal retained profits or general reserves.

¹⁹ Revaluation reserve is created when there is an increase in the book value of an asset when it is revalued based on the prevailing market value. These arise in two ways. Firstly, in some countries, banks (and other commercial companies) are

and subordinated term debt instruments^{22,23} It is upto the discretion of national banking supervisory authorities to decide which of the elements of supplementary capital may be included. Further, each of the Tier 2 components has individual ceilings.

However, goodwill is to be deducted from Tier 1 capital.²⁴ Also, since the intention is to assess the capital adequacy of banking groups as a whole by capturing their aggregate credit exposure, investments in unconsolidated banking and financial subsidiary companies and investments in the capital of other banks and financial institutions have to be deducted from total capital. Further, each central bank can decide whether to deduct cross-holdings of banks' capital investments in other banks and financial institutions in order to discourage the banking system as a whole from creating cross-holdings of capital, rather than drawing capital from outside investors. This provision is given because such double-gearing (or "double-leveraging") can cause the rapid transmission of problems from one bank to another and have systemic dangers for the banking system.

The simple five-scale weighting scheme, together with the distinction made between OECD and non-OECD countries, has led to the following weighting structure for various loan categories under Basel I.

Given that borrowers from OECD countries are considered to be of the highest creditworthiness, claims on central governments and central banks within the OECD attract only zero weight.

permitted to revalue fixed assets (normally their own premises) from time to time in line with the change in market values. Secondly, banks whose balance sheets traditionally include very substantial amounts of equities held in their portfolio at historic cost, can realise them at current prices and use them to offset losses. Under Basel I, the resultant revaluation reserves can be included in Tier 2 capital base given that they can be used to absorb losses on an ongoing basis.

²⁰ General provisions or general loan-loss reserves are created against the possibility of unidentified losses. Where they do not reflect a known deterioration in the value of particular assets, these reserves qualify for inclusion in tier 2 capital. However, where provisions or reserves have been created against identified or expected losses, they are not freely available to meet unexpected losses. In such a case, they do not qualify as Tier 2 capital. Further, general loan-loss reserves that qualify for inclusion in Tier 2 under the terms described above, do so, subject to a limit of 1.25 percentage points of weighted risk assets.

²¹ These are capital instruments which combine certain characteristics of equity and certain characteristics of debt. Where these instruments have close similarities to equity, in particular when they are able to support losses on an ongoing basis without triggering liquidation of the bank, they may be included in supplementary capital. Examples are convertible bonds and cumulative preference shares.

²² Subordinated term debt is debt which cannot be called upon to be repaid for a particular term (usually long) and ranks lower than (that is, subordinated to) the ordinary depositors of the bank. The latter means that in the event of bank insolvency, it will be paid out only after the depositors. Given that such debt is therefore available to meet a bank's losses, such instruments with a minimum original term to maturity of over five years may be included in supplementary capital, but only to a maximum of 50% of the core capital element.

²³ Hybrid capital such as certain convertible bonds and cumulative preference shares also has funding costs; but since they may be suspended in certain conditions, they do provide a layer of protection for other senior creditors of the bank.

²⁴ When goodwill is placed on a company's (in this case, a bank) balance sheet, it represents the excess price paid by it to acquire another enterprise over the sum of the fair values of all the net acquired assets. That is, the acquirer incurs a cost in purchasing the goodwill of the acquired company and proper accounting requires that it be amortized against or matched against earnings.

However, claims on central governments and central banks outside the OECD attract zero weight only when such loans are denominated in the national currency and funded in the same currency.²⁵

In the case of loans to public sector enterprises (PSEs) owned by state or other local governments,²⁶ each central bank has the discretion to determine the appropriate weighting factors, which could be 0, 10, 20 or 50% for domestic PSEs. But, claims on such PSEs in foreign countries within the OECD attract only a standard 20% weight, again under the assumption of their lower risk. At the same time, given that loans to private-sector commercial enterprises are weighted at 100%, loans to commercial companies owned by the public sector in both OECD and non-OECD are risk weighted at 100%, in order to avoid creating any competitive bias between those owned by public and private sectors.

As for inter-bank claims, a 20% weight has been uniformly applied to all short-term loans²⁷ to banks whether incorporated in or outside the OECD. However, while longer-term loans to OECD incorporated banks are also weighted at 20%, longer-term loans to banks incorporated in non-OECD countries are weighted at 100%. It is obvious that this differentiation in risk weighting between short-term and long-term loans with a higher risk weight attached to long-term loans given to banks incorporated in non-OECD countries creates a bias in favour of short-term bank loans to these countries. We will examine some implications of this in a later section.

Clearly, credit risk applies not only to loans, but to other balance sheet exposures such as collateral, guarantees, and securities investments made by banks as well. The Accord recognizes the risk-reducing effect of the latter by making the risk weight of the collateralised claim²⁸ equivalent to the risk weight of the attached collateral (or the guarantor), which would make it lower than that for non-collateralised debt. However, only certain collateral are recognized in this manner. The limited recognition of collateral applies only for loans secured against cash, and against securities issued by OECD central governments, OECD PSEs, or specified multilateral development banks. Loans fully collateralised by any of these will attract the weight given to cash (0%) or the securities used as collateral. Loans partially collateralised by these assets will also attract the equivalent weights on that part of the loan which is collateralised.

Similarly, in the case of commercial loans or other exposures guaranteed by third parties, the Accord allows loans guaranteed by OECD central governments, OECD PSEs, or OECD incorporated banks to be allocated the risk weight attached to a direct claim on the guarantor. Thus, for example, loans guaranteed by OECD central governments will be risk-weighted at 0%, OECD incorporated banks will be risk-weighted at 20%, etc. Similarly, a 20% risk-weight applies

²⁵ The logic behind this is that if banks fund these loans in the borrowing country's currency, there is no foreign exchange risk, and in such cases, loans to non-OECD countries can also be considered risk free.

²⁶ PSEs owned by central governments get covered under the previous loan category of zero credit risk due to the implicit or explicit sovereign guarantees.

²⁷ Short-term loans are those with a residual maturity of up to and including one year.

²⁸ A collateralised transaction is one in which a credit exposure or potential credit exposure is hedged in whole or in part by collateral posted by a counterparty, or by a third party on behalf of the counterparty.

to loans guaranteed by non-OECD incorporated banks also, but only where the underlying transaction is short-term. This would also create a bias in favour of short-term loans; in this case, those guaranteed by non-OECD banks. In the case of loans covered by partial guarantees, the reduced weight applies to only that part of the loan which is covered by the guarantee.

Since loans fully secured by mortgage on residential property which is rented or is occupied by the borrower has been observed to have a very low record of loss, the Accord assigns only a 50% weight to them. But, in order to prevent the misuse of this lower capital requirement by banks by lending to companies engaged in the business of property development, loans to companies engaged in speculative residential building or property development are specifically excluded from this category of assets. Meanwhile, apart from bank premises, plant & equipment and other fixed investments, investments in real estate, non-consolidated investment participation in other companies and all other on-balance sheet assets bear the highest risk weight of 100%.

The framework also takes account of the credit risk on off-balance sheet exposures undertaken by banks. With the exception of foreign exchange and interest rate-related contingencies, all categories of off-balance sheet engagements are converted to their credit risk equivalents by multiplying the nominal principal amounts by a credit conversion factor (CCF). The CCF for each instrument is derived from the estimated size and likely occurrence of the credit exposure, as well as the relative degree of credit risk. The resulting amounts are then weighted according to the nature of the counterparty. For example, instruments which substitute for loans (for example, general guarantees, bank acceptance guarantees and standby letters of credit serving as financial guarantees for loans and securities) carry a 100% credit risk conversion factor or CCF. On the other hand, short-term, self-liquidating trade-related contingent liabilities arising from the movement of goods (e.g. documentary credits collateralised by the underlying shipments) attract only a 20% CCF, reflecting the reduced risk due to the collateral. Formal standby facilities and credit lines with an original maturity of upto one year or which can be unconditionally cancelled at any time (both implying a very limited risk), attract a zero CCF.

Interest and exchange-rate related derivative contracts²⁹ such as swaps, options, futures, etc. also come under off-balance sheet exposures. At the time of Basel I, it was recognised that the

²⁹ Derivatives are contracts or instruments identified by reference to another obligation and whose value is derived from the price of another instrument, index, or measure of economic value. The main function of derived instruments is to enable buyers and sellers to adjust the degree of risk they wish to carry. They include futures and forwards, options, swaps, etc. An "option" contract gives the beneficiary the right to buy or sell a financial asset or commodity at a specified price within a specified period. The beneficiary can choose to either exercise the option or to disregard it. A "futures" contract allows the holder to purchase or sell a fixed amount of commodities or financial assets at a pre-specified price on a particular future date. A "swap" is a transaction whereby a security is sold to a buyer in exchange for the purchase of another of the same value, to achieve a perceived improvement in the quality of the portfolio held by both parties. There are swaps between different currencies (currency swaps), and between variable and fixed interest loans (interest rate swaps). There are a wide variety of interest rate-related instruments in the market such as single-currency interest rate swaps, basis swaps, forward rate agreements, interest rate futures, interest rate options purchased, etc. Exchange rate contracts include cross-currency interest rate swaps, forward foreign exchange contracts, currency futures, currency options purchased and similar instruments. There are also similar derivative instruments based on gold, equities or equity indices, energy contracts, agricultural contracts, base metals (e.g. aluminium, copper, and zinc), and precious (silver, platinum and palladium) and non-precious metal commodity contracts.

amounts of business involving derivatives, particularly in the newer, more innovative instruments are rather small for most countries to justify a complex analytical approach. Further, in these cases, banks are not exposed to credit risk for the full face value of their contracts, but only to the potential cost of replacing the cash flow if the counterparty defaults. This is the replacement value of outstanding contracts at current market prices where this is positive. The credit risk equivalent amount can therefore be calculated in two ways. The “current” exposure method is to obtain the current market value of the instrument (by marking contracts to market) and to apply an additional factor for the potential future credit exposure calculated on the basis of the total notional principal amount on its book, for the remaining life of the contract. In the simpler original exposure method, a simple CCF is applied as above on the underlying principal amount.

Given that interest rate, exchange rate and gold contracts have been used sparingly at the time, the simpler method has been prescribed for them until market risk-related capital requirements (to be discussed in detail below in the section on Market Risk Amendment) are implemented. However, banks that engage in forwards, swaps, purchased options or similar derivative contracts based on equities, precious metals except gold, or other commodities, are required to apply the current exposure method. Once the bank has calculated the credit equivalent amounts, they are weighted according to the category of counterparty in the same way as in the main framework.

Implementation of Basel I

The general guideline to central bankers under Basel I has been that they must set prudent and appropriate minimum capital adequacy requirements and encourage banks to operate with capital in excess of the minimum.³⁰ It was also suggested that supervisors should consider requiring higher than minimum capital ratios when it appears appropriate due to the particular risk profile of a bank or if there are uncertainties regarding the asset quality, risk concentrations or other adverse characteristics of a bank’s financial condition.

Even though the Basel Committee’s conclusions do not have legal force, and the standards were meant to raise the levels of bank capital in the G-10 countries, most of the agreements reached have been accepted and implemented by non G-10 countries. The acceptance of G-10 standards by non-G-10 countries has come about not only due to efforts made by the Basel committee to disseminate the agreement, but more crucially, due to the role played by the IMF, the World Bank and regional development banks in spreading the standards adopted by the BIS committees, through their surveillance and through the conditions attached to their loans. Basel capital adequacy norms have been implemented in many developing and less developed countries while financial sector reforms were carried out as part of the structural adjustment programs or later on through the economic liberalisation measures promoted under the Washington Consensus. In fact, as part of its financial sector assessment program (FSAP), the

³⁰ For instance, the Ugandan central bank has chosen to mandate a core capital of not less than 8% and a total capital of not less than 12% of the total risk adjusted assets plus risk adjusted off-balance sheet items.

IMF currently assesses members' compliance with financial sector codes and standards, of which the Basel Accord is one of the three Basel core principles.³¹ Further, market pressure has also played a role in the rapid acceptance and diffusion of the Basel capital adequacy standards, because private rating agencies consider meeting Basel capital adequacy standards as an important element in rating financial institutions.

The guidelines proposed in Basel I have thus become the de facto global standards and have been progressively introduced in virtually in all countries with active international banks. Overall, a total of 125 countries have adopted the Basel Accord.³² In some countries, significant adjustments were required to reach the 8 per cent capital adequacy ratio, either by limiting the growth of risky assets or by raising new capital. Banks which were already close to or above the minimum requirements were clearly less subject to these pressures. However, it has been pointed out that they too were affected by an increased awareness by creditors, analysts, shareholders and the financial press of the nature of risks in banking and the need for capital to protect against these risks.³³ Indeed, it has been observed that banks on average maintain CARs well above the regulatory minimum.

Meanwhile, several amendments have been made to Basel I since the early 1990s either to further refine the categories of capital base and assets, or to incorporate better sophistication in risk weighting.

What Has Happened Since Basel I?

Criticism of Basel I

Several studies of the experience in the US and elsewhere, both pre- and post-Accord, suggest that firmly applied capital standards do induce weakly capitalised banks to rebuild their capital ratios in various ways, more rapidly than otherwise.³⁴ However, the series of financial crises in the 1990s reveals that while CAR as a technical standard may have been met across banks, the ultimate objective of preventing bank failures or reducing systemic fragility has been elusive. Although this has to fundamentally do with increased financial liberalisation and globalisation which has resulted in increased freedom for unregulated capital movements, at least some of the banking sector weaknesses have been linked to problems in the regulatory framework of Basel I by critiques.

³¹ The other two are the core principles for securities issued by IOSCO and for insurance by IAIS.

³² There are only 11 countries across the world, which have not adopted the Basel Accord. Source: Barajas, Chami and Cosimano, 2005.

³³ It has been pointed out that since capital adequacy standards have increased transparency, they enable financial markets to "punish" poorly capitalized banks and reward banking systems with higher capital levels (by affecting share prices). Rating agencies are therefore said to have been instrumental in promoting national and international capital adequacy regulations and driving up the overall capital adequacy ratio. See Ghosh and Das, 2005.

³⁴ BIS, 1999, Capital Requirements and Bank Behavior: The Impact of the Basle Accord, Basle Committee on Banking Supervision Working Paper.

One of the general criticisms of the 1988 Basel Accord has been that the increased capital requirements were responsible for the greatly diminished lending by banks in the US and other countries in the late 1980s and early 1990s. The inability of the world economy to rebound from a recession in the 1990s has thus been blamed on the systematic curtailment of lending induced by higher capital requirements. This view is, however, in complete disregard of the underlying structural problem, which arises specifically from the obsession of liberalised financial markets with short-term profiteering, and the imbalances in sectoral lending practices which this leads to. Indeed, this has had everything to do with the boom and bust financial cycles associated with business cycles.

It should be stressed that developed countries had seen widespread financial liberalisation since the 1980s, driven by the neoclassical paradigm that financial deepening and financial sector reforms will lead to faster economic growth. There has been an associated paradigm shift in the role perceived for financial sector in the economy, which changed from financial intermediation especially geared to meet the productive sectors' need for financing, towards concern with only increase in the "efficiency" of financial institutions as the main objective. Under this paradigm, the definition of optimal investment allocation underlying financial liberalisation is based on profit maximising investments.

There has been ample evidence that this paradigm shift has led to a change in the priorities of financial investors, including banks. A shift towards market-driven investment allocation decisions by banking and capital market segments leads to an overall concentration of financial flows into selective sectors. This happens because of the competition pressures (within and outside the banking sector) as well as because of a tendency for herd behaviour and speculation that drive investments into particular sectors at particular phases of a boom, which divert capital away from where it is much required.³⁵ Many of the problems underlying the lack of economic momentum in the 1990s can thus be derived not to a shortage of credit, but to excessive credit flowing to speculative sectors which have led to financial bubbles and associated stock market and real estate booms. Such overextension in the financial system, in the form of rapid credit expansion accompanied by unusually sharp increases in asset, especially property, prices during the economy's upswing, tends to sow the seeds for subsequent strains in the financial system, once the movements reverse. Empirical evidence is generally consistent with the view that this procyclicality of the financial system³⁶ has been at the root of financial instability. It has been shown that this was the case to varying degrees in the industrial world, in those countries that experienced banking system problems in the early 1990s, including the United States, Japan, the United Kingdom, Australia, Sweden, Norway and Finland. Similar evidence has been observed

³⁵ See Dhar and Kallummal, 2002, Pettifor, ed., etc.

³⁶ The movement in a financial indicator is said to be "procyclical" if it tends to amplify business cycle fluctuations. According to this definition, for instance, bank provisions behave procyclically if they fall in economic upswings and rise in downswings. See Crowe, Furfine and Lowe, 2000.

in the more virulent episodes of financial instability in emerging market countries in the 1990s, where boom and bust cycles tended to be more pronounced.³⁷

It has been shown that while risk-weighted assets fell in the aftermath of the banking crises given that developed country banks shifted their portfolios away from commercial lending (which has a relatively high risk weight) towards residential mortgages and public sector securities (both of which have relatively low risk weights in Basel I), total assets did not fall proportionately.³⁸ That is, while there was some curtailment in credit, there was significant shuffling of portfolios by banks to bring down their risk-weighted assets (so as to increase their CARs to the Basel I level).

Drawing from a data set comprising 2,893 banks and 152 countries over the period 1987 to 2000, Barajas, Chami and Cosimano (2005) tested whether the adoption of the Basel Accord by Latin American and Caribbean countries was responsible for the serious slowdowns in credit growth experienced by these countries. They found that the Basel Accord was associated with an average increase in capital and lending activities in Latin America as well as throughout the world. With regard to the “credit crunch” hypothesis, there was little evidence that either the loan-asset ratio or the average growth rate of loans declined after Basel I adoption. However, there was again some evidence of greater sensitivity of loan growth to certain risk factors, as one might expect from a “risk retrenchment” behaviour of banks subjected to greater regulatory scrutiny. In Latin America, this effect was observed primarily through a greater sensitivity of banks’ loan growth to past shortfalls in their equity capital.

However, a related important criticism of Basel I has been that its categories for risk weighting bank assets do not correspond to actual risks across various loan categories, as measured by banks’ own internal models, and that this situation has created perverse incentives leading to distorted lending practices. A number of instances have been highlighted. For example, Griffith-Jones and Spratt (2002) have pointed out that in Basel I, capital requirements for lending to highly rated borrowers are in excess of that which the banks would choose to hold, which puts them at a commercial disadvantage with respect to non-bank institutions. Again, given that local-currency public liabilities have been treated with a zero risk weight, Rojas-Suarez (2002) has stressed that unlike in developed countries, bank capital fails to send warning signals ahead of crises in developing countries due to the regulatory distortions in the 1988 Accord that encouraged bank lending to the public sector. Both these are supported by the evidence presented above in terms of the credit portfolio shift.

Thus, while pro-cyclicality is an integral feature of liberalised financial systems and markets, it seems that Basel I with its simple five-scale risk weighting scheme led to particular imbalances in bank lending, which exacerbated the boom-bust cycles in the financial systems in several countries.

³⁷ See Borio, Furfine and Lowe, 2000, p. 17.

³⁸ Ibid.

Another example of regulatory bias is pointed out as the incentive towards short-term lending created by Basel I, which has been brought out compellingly in the analysis of the late 1990s' financial crisis. As we saw above, the current BIS recommended risk weight for claims on non-OECD institutions with a residual maturity of less than and up to one year is 20 per cent, whereas claims over one year have a recommended risk weight of 100 per cent. Clearly, for international banks, this makes short-term lending to banks outside the OECD region more profitable than long-term lending, and it has been pointed out by a number of economists that this may have contributed to the heavy build-up of short-term debt in some East Asian countries immediately prior to the late 1990s' crisis.³⁹

While this pro-cyclicality in lending and bias towards short-term lending needs to be addressed, it has also been increasingly recognised that Basel I has turned out to be too simplistic to address the needs of the banking system which has witnessed enormous structural transformation as well as an evolution of its risk management practices.

Transformation of the Financial Sector

The financial sector has undergone several changes since at least the late 1980s. First of all, liberalisation of the domestic banking sectors in developed countries had increased the flexibility of banking and financial institutions when creating credit and making investments. While at one level this led to the emergence of securitisation,⁴⁰ at another level, this led to financial innovation involving the creation of a range of new financial instruments or derivatives such as swaps, options and futures.⁴¹

Secondly, financial sector deregulation meant that the regulatory walls that separated the banking sector from the stock market were removed, with banks allowed to invest in equities, provide loans against shares as collateral to both individuals and stock-brokers, and offer guarantees to the broking community. Thus banks' investment in securities of various kinds has gained in importance, increasing their exposure to stock markets. This meant that depending on whether their involvement is in the form of direct investment in shares, advances against shares,

³⁹ Raffer (2006) points out an important micro-macro dimension of this problem. Clearly, for any individual loan, a shorter maturity means, *ceteris paribus*, lower risk than one of longer maturity. But if "all loans to Thailand are with three months' maturity" there is a problem, and their effect becomes highly destabilising. But as rules and norms are made for all lenders rather than for single individual loans, this macro-effect should have been foreseen.

⁴⁰ Securitisation is the complete or partial transfer of the risks of assets on a bank's balance sheet to outside investors, most often through the establishment of a special purpose entity (SPE), which receives the assets in question (and the associated risks) and then issues securities as claims against them. The securities issued to investors are frequently divided into tranches carrying successively higher levels of risk and correspondingly higher rates of return. The lower-risk tranches have priority in the allocation of cash flows from the underlying securitised assets. Banks themselves may retain the highest-risk tranche (the first-loss position) and perhaps part of the other more junior tranches, for the purpose of credit enhancement. Source: Cornford, 2005.

⁴¹ Even though Basel I has taken account of banks' use of derivatives, banks' involvement in the derivatives trading markets and the associated market risks have grown manifold since then.

or guarantees, the impact of stock price fluctuations began to impinge on the value of banks' assets, directly or indirectly.

Another aspect of financial liberalisation has also seen the breaking down of institutional barriers between banking and non-banking financial institutions. Deregulation of the areas of bank operations has resulted in increased activities of banks in the securities and insurance sectors, both as competitors across institutional boundaries, or by the formation of links with other intermediaries forming financial conglomerates.⁴²

All these different dimensions of financial sector liberalisation has had the effect of increasing competition, which in turn drove developed country banks to search out new recipients for loans and investments in economic regions (and sectors) that were hitherto considered to be too risky, in order to earn the associated higher returns. The massive increase in international liquidity that followed has found banks and non-bank financial institutions desperately searching for means to keep their capital moving in order to deliver returns. This was instrumental in the booms in consumer credit and housing finance in the developed nations, which we saw in the earlier section. Later, the same pattern of financial overextension occurred in a number of developing countries discovered as "emerging markets". Debt and equity capital investments began to flow *en masse* especially into countries that were quick to liberalize their own rules relating to cross-border capital flows and foreign exchange convertibility, and who liberalised their domestic financial sectors. As a result of these developments, there has been a host of new financial assets in emerging markets characterized by higher interest rates, ostensibly because of greater investment risks in these areas. The greater "perceived risk" and higher returns associated with financial instruments in these countries also provided the basis for a whole range of new derivatives that bundled these risks and offered hedges against risk in different markets.

Currently, risk management in the financial (as well as non-financial) sphere comprises of a range of possible instruments and contracts for the control and redistribution of risks. In particular, there has been a rapid spread in the practice of credit-risk transfer (CRT) techniques, which are used to repackage and transfer risk from banks' balance sheets. Contractual transfers of credit risk such as financial guarantees and credit insurance have been around since quite some time in the financial markets. In the past few years, however, the range of credit risk transfer (CRT) instruments and the circumstances in which they are used have widened considerably.

Increasingly, banks go about their work on the basis that loans will not be held on their balance sheets until maturity. Rather, they think about credit exposures as a tradable commodity, shifting loans off their balance sheet either individually or as part of a package through loan transfers and securitisation. The techniques used and the conditions associated with securitisation have been the subject of substantial development and innovation in recent years. Securitisation now involves not only the transfer of the underlying assets such as commercial loans and credit-card

⁴² The discussion on various aspects of financial liberalisation is drawn from Chandrasekhar, 2003.

receipts to special purpose entities or SPEs (“traditional securitisation”), but also the transfer to SPEs of guarantees or credit derivatives linked to these assets (“synthetic securitisation”).⁴³

Arbitrage⁴⁴ in the pricing of these financial instruments used for risk management (derivatives, etc.) has also been playing a crucial role in the functioning of their markets. These instruments, together with developments in communications technology linking different markets more closely, have made possible an enormous expansion in the use and trading of hedging instruments. Complex products of financial engineering have been constructed from the combinations of such instruments. The network of organised markets for the trading of futures and options is now global with trading centres in both developed countries and emerging financial markets.⁴⁵

By the end of the 1990s, it was thus becoming evident that the risk profile of banks has undergone a sea change. While the swapping of assets and obligations between two parties could help banks in managing their balance sheet risk exposures, the financial crises of the late 1990s were an eye opener of the fact that such financial innovations also helped in concealing the true nature of transactions from regulators.

The 1990s also saw a significant increase in both intra-industry (across banks) and cross-industry mergers and acquisitions (M&As straddling both banking and non-banking financial firms) within the financial sector. This has intensified not only concentration in the financial sector as a whole, but has also intensified the tendency towards entanglement of banks (& non-banks) in sectors characterised by differential risk and substantially differential returns, thereby increasing the share of high-risk assets in the portfolio of large financial entities.⁴⁶ From the perspective of financial stability, the limited number of market makers has raised concerns about whether liquid markets could be maintained in the event a single large dealer stopped trading for any reason.

Thus, the growing globalisation of financial institutions combined with the structural changes in banking and greater sophistication in communication technologies have contributed to the emergence of new risks and to the intensification and rapid transmission of risks. As banking has become globalized and not just internationalized,⁴⁷ cross-border regulatory and supervisory issues have also grown. It was therefore recognized by the Basel Committee that Basel I has become inadequate to actually define or measure the extent of “capital” following the transformation of banking business.

⁴³ Cornford, 2005b.

⁴⁴ Arbitrage involves buying an asset that is perceived to be undervalued and simultaneously selling a similar asset that is expected to fall in price.

⁴⁵ See Cornford, 2005b.

⁴⁶ See Chandrasekhar, Ghosh and Francis, 2004.

⁴⁷ Internationalization of banking generally refers to cross-border lending and globalization refers to banks setting up subsidiaries and branches in multiple countries. Globalization increased significantly in the 1990s.

The Market Risk Amendment

The developments in credit and equity markets along with the impact of e-commerce mean that market risks have become more significant for banks and have to be monitored on an on-going basis. Even though derivatives were considered under Basel I, the amounts of such business, particularly in the newer, more innovative instruments, were only small for most countries, and at the time, only a simple approach was followed as discussed in the earlier section, that too only for the exposures on banks' banking books. However, it is clear that all internationally active banks are likely to be involved in trading to some extent. The increased exposure by banks to market risks, arising from the changes in the culture of banking with their involvement in derivatives and CRT markets means that the risk of loss due to unfavourable movements in securities prices, interest rates, and exchange rates has grown immensely. Thus, it was recognised by the Basel Committee that it is imperative to refine the framework for measuring capital adequacy by incorporating market risk explicitly. Since established accounting principles cause these risks to be typically most visible in a bank's trading activities⁴⁸ (whether they involve debt or equity instruments, or foreign exchange or commodity positions), it was therefore considered appropriate to provide an explicit capital cushion for the price risks to which banks are exposed on their trading books.

Thus in January 1996, the Committee issued an amendment⁴⁹ which measures and applies capital charges in respect of the market risks arising from banks' open positions in equities, traded debt securities,⁵⁰ foreign exchange, commodities and options. This sets the capital requirements for banks' exposures to certain trading-related activities, including counterparty credit risk, and the treatment of double default effects.⁵¹ In the same way as for credit risk, the capital requirements for market risk apply on a worldwide consolidated basis. The capital charge under the standardised measurement method will be the measures of risk obtained from interest rate, equity position, foreign exchange and commodities, along with price risk from options, summed arithmetically.

An important aspect of this amendment is that as an alternative to a standardised measurement method, banks are permitted to use internal models as a basis for measuring their market risk capital requirements, subject to strict quantitative and qualitative standards. This was the first time that the Basel Committee would acknowledge the changes in commercial banks' risk assessment approaches with the development and implementation of internal grading systems,

⁴⁸ The trading book consists of positions in financial instruments and commodities held either with trading intent or in order to hedge other elements of the trading book. To be eligible for trading book capital treatment, financial instruments must either be free of any restrictive conditions on their tradability or able to be hedged completely. Financial instruments include both primary financial instruments (cash instruments) and derivative financial instruments. Positions held with trading intent are those held intentionally for short-term resale and/or with the intent of benefiting from actual or expected short-term price movements or to lock in arbitrage profits.

⁴⁹ BIS, 2005, Amendment to the Capital Accord to Incorporate Market Risks, Basel Committee on Banking Supervision, Updated November 2005.

⁵⁰ Covers all fixed-rate and floating-rate debt securities, and instruments that behave like them such as non-convertible preference shares, convertible bonds, etc., for all of which interest rate risk applies.

⁵¹ Double default risk is the risk that both the borrower and the protection provider will default on the same obligation.

which classify loans into specific risk categories or ratings. These internal ratings are used by banks as inputs into decisions regarding pricing, capital allocation and provisioning.

The principal form of eligible capital to cover market risks consists of shareholders' equity and retained earnings (Tier 1 capital) and supplementary capital (Tier 2 capital) as defined in the 1988 Accord. But banks may also, at the discretion of their national authority, employ a third tier of capital ("Tier 3"), consisting of short-term subordinated debt, for the sole purpose of meeting a proportion of the capital requirements for market risks. For short-term subordinated debt to be eligible as Tier 3 capital, it needs to be capable of becoming part of a bank's permanent capital and thus be available to absorb losses in the event of insolvency. However, eligible Tier 3 cannot exceed 250 per cent of the difference between total Tier 1 capital and Tier 1 capital assigned to credit risk, that is, 250 per cent of the Tier I capital available to meet market risk.

With the incorporation of market risks, total capital requirement is calculated as follows. First, the measure of market risk has to be multiplied by 12.5 (i.e. the reciprocal of the minimum capital ratio of 8%), to create trading book notional risk weighted assets. By doing this, the bank creates a numerical link between the calculation of the capital requirement for credit risk, where the capital charge is based on the risk-weighted assets, and the capital requirement for market risk, where instead the capital charge itself is calculated directly. The resulting figure is added to the sum of risk-weighted assets calculated for credit risk. The capital ratio will then be calculated in relation to the sum of these two, using eligible capital as the numerator. The quoted capital ratio will thus represent capital that is available to meet both credit risk and market risk.⁵²

The Revised Capital Accord or Basel II

The systemic impact of the combination of the new challenges presented by financial innovation, the breakdown of barriers between different sectors of the financial world, and the growth of financial conglomerates, all of which have given rise to longer-term changes in the structure of financial markets came out starkly in the series of emerging market crisis in the late 1990s, with regulators caught unaware of the hidden risks and the pyramiding of risks in the system. Meanwhile, as already mentioned, more sophisticated technology and telecommunications, as well as market innovations, have enabled the larger banks to better measure and manage their risks. This has meant that industry developments in risk measurement and management have widened the gap between the regulatory capital measure under the 1988 Accord and the internal capital measures used at many internationally active banks. As a result, the Basel Committee determined that a new capital framework was needed that would address these developments for the most complex and sophisticated banks, but that, it hopes, would also be appropriate for less complex banks.

⁵² Part C of the Market Risk Amendment document gives worked out examples of the calculation of capital ratio for different instruments.

The Outline and the Scope of Application

Originally mooted in 1999, the underlying objective in revising the 1988 capital adequacy framework has therefore been to develop more risk-sensitive capital requirements by taking into account changes in the banking and risk management practices of banks. Thus, two significant innovations of the Revised Basel Capital Accord or Basel II⁵³ are: the greater use of banks' own internal assessments of risk as primary inputs in the calculations for regulatory capital,⁵⁴ and the expansion of capital coverage to include operational risk,⁵⁵ in addition to credit risk and market risk. But, overall, Basel II retains key elements of the 1988 Accord, including the general requirement for banks to hold aggregate capital equivalent to at least 8% of their risk-weighted assets; the basic structure of the 1996 Market Risk Amendment regarding the treatment of market risk; and the definition of eligible capital.

The Revised Accord is a 284 page document divided into three sections centred on three pillars namely, minimum capital requirements, supervisory review process and market discipline. The first Pillar describes the alternative approaches available for the calculation of capital requirements for credit risk and operational risk. The second Pillar addresses the supervisory review process by national regulators for ensuring comprehensive assessment of the risks and capital adequacy of their banking institutions. The disclosure standards provided under the third Pillar require banks to publicly disclose key information regarding their risk exposures and capital positions, and aims at improving market discipline. Because Basel II gives banking institutions greater discretion in calculating their own capital requirements, it is anticipated that the disclosure statements will allow market participants to better assess the safety and soundness of the banking environment and thus exert stronger market discipline.

Basel II proposes to permit banks three options for evaluating their capital requirements for credit risk and operational risk, with increasing degrees of complexity. The options for calculating credit risk are the Standardized approach and two Internal Ratings-Based (IRB) approaches with progressive degrees of sophistication - the foundation approach and the advanced approach. The Standardized approach is similar to the current approach for categorizing bank assets according to their risk and then weighing them using fixed weights; however, the calibration of risk is based on the assessments by external credit assessment

⁵³ BIS, 2005, International Convergence of Capital Measurement and Capital Standards, A Revised Framework, Updated November 2005, available at <http://www.bis.org/publ/bcbs118.pdf> The Revised Framework was originally published by the BCBS in July 2004. Prior to that, three Consultative Papers were circulated. For a useful detailed discussion of the evolution of proposals and the changes that were made in the run upto the Revised Framework, see Cornford, 2005a.

⁵⁴ As we saw already, the Basel Committee began incorporating internal risk models with the 1996 Market Risk Amendment.

⁵⁵ Operational risk is defined as the risk of loss resulting from inadequate or failed internal processes, people and systems or from external events. The definition includes legal risk but excludes strategic and reputational risk. It is clear that operational risk differs from other banking risks in that it is typically not directly taken in return for an expected reward, but exists in the natural course of bank activity. Operational risk event types include internal fraud, external fraud, employment practices and workplace safety, clients, products, and business practices, damage to physical assets, business disruption and system failures, execution, delivery and process management failures, etc. See BCBS, 2003, Sound Practices for the Management and Supervision of Operational Risk.

institutions (ECAIs), with an important role being given to credit rating agencies. There are also alternative options for taking account of techniques for reducing exposure through credit risk mitigation. By contrast, the IRB approaches allow banks to use their internal rating systems for credit risk.

Similarly, there are three options for calculating operational risk: the basic indicator approach, the standardized approach, and the advanced measurement approach, with varying degrees of bank-provided versus regulator-provided inputs in the calculations of operational risk. While operational risk has always been a concern for bankers and has been sought to be mitigated by banks' internal control system and internal audit function, Basel II will require banks to address operational risk as a distinct class of risk similar to their treatment of credit and market risks. There is a distinct set of methods for estimating capital requirements for securitisation exposures also, which involve these exposures' own Standardised and IRB approaches, three different variants being available under the latter. The Basel Committee intends that alternative approaches would enable banks and national regulators at different levels of sophistication to choose methods that are appropriate to them.

Basel II framework will be applied on a consolidated basis to internationally active banks, continuing the application of the principle adopted since 1978 for the consolidated supervision of international banking groups. Any holding company that is the parent entity within a banking group will be included on a fully consolidated basis, to ensure that it captures the risk of the whole banking group. All banking, securities and other⁵⁶ financial activities (both regulated and unregulated, but excluding insurance) conducted within a group containing an internationally active bank will be captured through consolidation. However, significant minority investments in banking, securities and other financial entities, where control does not exist, will be excluded from the banking group's capital by deduction of the equity and other regulatory investments. But, individual banks (within a banking group), whether they are consolidated or not, are required to be adequately capitalised on a stand-alone basis. Under the revised framework, reciprocal crossholdings of bank capital designed to artificially inflate the capital position of banks will be deducted for capital adequacy purposes, by definition.

An expansion in the scope of application of Basel II arises from the consideration of banks' significant minority and majority investments in commercial entities which exceed certain threshold levels, which will also be deducted from banks' capital. Threshold levels of 15% of the bank's capital for individual significant investments in commercial entities and 60% of the bank's capital for the aggregate of such investments, or stricter levels, will be applied.

⁵⁶ Examples of the types of activities that financial entities might be involved in include financial leasing, issuing credit cards, portfolio management, investment advisory, custodial and safekeeping services and other similar activities that are ancillary to the business of banking.

Minimum Capital Requirements and Risk-weighted Assets

The definition and requirements for capital are unchanged from the original Accord. As under Basel I, the minimum required capital adequacy ratio (set at 8%) is calculated as regulatory capital divided by risk exposure, where the latter is measured by risk-weighted assets.

The definition of eligible regulatory capital, as outlined in the 1988 Accord and clarified in 1998 to include innovations in Tier I, remains the same except for some modifications. Innovative instruments will be limited to 15% of Tier I capital, net of goodwill. Tier 2 capital is limited to 100% of Tier 1 capital. The definition of Tier 3 capital as set out in the Market Risk Amendment also remains unchanged.

However, while general loan-loss reserves can be included in Tier 2 capital subject to the limit of 1.25% of risk-weighted assets under the Standardised approach to credit risk as in Basel I, this treatment is withdrawn under the IRB approach.⁵⁷ The calculation of risk weights involves fuller recognition of provisions before estimation of capital under the IRB approach. Thus, banks using the IRB approach for securitisation exposures or the PD//LGD approach for equity exposures must first deduct the expected loss (EL) amounts. Banks using the IRB approach for other asset classes must compare (i) the amount of total eligible provisions, with (ii) the total expected loss amount as calculated within the IRB approach. Where the total expected loss amount exceeds total eligible provisions, banks must deduct the difference on the basis of 50% from Tier 1 and 50% from Tier 2. When expected loss is less than eligible provisions, the excess provisions may be recognised as part of Tier 2 capital up to a specified proportion of risk-weighted assets.

A major difference under Basel II is that the risk exposure will be the aggregation of credit risk, market risk and operational risk of the bank, with more refined measures incorporated for calculating credit and operational risks. Total risk-weighted assets are determined by multiplying the capital requirements for market risk and operational risk by 12.5 (i.e. the reciprocal of the minimum capital ratio of 8%) and adding the resulting figures to the sum of risk-weighted assets for credit risk.

As for credit risk, under both the Standardized as well as the IRB approaches, the Accord describes and lists the risk weights prescribed for individual claims such as sovereign claims, non-central government PSEs, banks, securities firms, retail portfolios,⁵⁸ residential and

⁵⁷ While in standard treatments of banks' financial management, expected loss (EL) is covered by provisions and capital provides protection against unexpected losses (UL), Basel I avoided this distinction and allowed provisions to be included in capital (Tier 2). However, Basel II has adopted the refined approach where capital is meant to cover only UL. EL is to be covered by provisions specified as eligible for this purpose.

⁵⁸ Retail portfolio consists of exposures to an individual person or persons or to a small business that take the any of the following forms: revolving credits and lines of credit (including credit cards and overdrafts), personal term loans and leases (e.g. installment loans, auto loans and leases, student and educational loans, personal finance) and small business facilities and commitments. Mortgage loans are excluded to the extent that they qualify for treatment as claims secured by residential property. The expansion of retail loans in the portfolio of banks has been one of the greatest changes in banking. Excess exposure to the retail sector can affect the viability of banks because of the increased possibility of defaults.

commercial real estate, past due loans, off-balance sheet items, higher-risk categories, etc. The revised approach to credit risk mitigation (CRM) under Basel II allows a wider range of credit risk mitigants to be recognised for regulatory capital purposes than is permitted under the 1988 Accord. Thus, collateralised transactions, on-balance sheet netting, guarantees and credit derivatives, maturity mismatches,⁵⁹ etc. are all covered under CRM techniques.⁶⁰

The Standardised Approach

As opposed to the simple 5-grade scale for risk weighting under Basel I, the risk weights in the Standardised approach vary from zero for the highest creditworthy claims to 150 per cent (or more in certain cases) for the lowest-rated. The national supervisory authority will be responsible for assigning eligible external credit assessment institution's (ECAI)⁶¹ assessments to the risk weights available under the Standardised framework, i.e. deciding which assessment categories correspond to which risk weights. However, banks should use the ratings provided by a single chosen ECAI for all their claims. That is, they will not be allowed to “cherry-pick” the assessments provided by different ECAs for different exposures

Table 1: Risk Weights for Claims on Sovereigns and their Central Banks under Basel II

Credit Assessment	AAA to AA-	A+ to A-	BBB+ to BBB-	BB+ to B-	Below B-	Unrated
Risk Weight	0%	20%	50%	100%	150%	100%

As seen in Table 1, rather than the OECD-non-OECD distinction in Basel I, risk weights are assigned based on investment-grade/non-investment grade ratings. However, at national discretion, a lower risk weight may be applied to banks' exposures to their sovereign (or central bank) of incorporation, when it is denominated and funded in the domestic currency. Where this discretion is exercised, other central banks may also permit their banks to apply the same risk weight to domestic currency exposures to this sovereign (or central bank) funded in that currency.

Again, rather than the short-term/long-term distinction which Basel I makes for risk weighting inter-bank claims and between claims on OECD/non-OECD incorporated banks, Basel II offers two options.⁶² Under the first option, all banks incorporated in any given country will be assigned a risk weight one category less favorable than that of the sovereign of its incorporation.

⁵⁹ A maturity mismatch occurs when the residual maturity of the CRM is less than that of the underlying credit exposure. Where there is a maturity mismatch and the CRM has an original maturity of less than one year, the CRM is not recognised for capital purposes.

⁶⁰ However, it is recognized that while the use of CRM techniques reduces or transfers credit risk, it simultaneously may increase other risks (residual risks). Residual risks include legal, operational, liquidity and market risks. Therefore, the Accord points out that it is imperative for banks to employ robust procedures and processes to control these risks.

⁶¹ ECAs could be either credit rating agencies fulfilling certain conditions or export credit agencies (ECAs).

⁶² National supervisors will apply one option to all banks in their jurisdiction.

However, for claims on banks in sovereigns rated BB+ to B- and for banks in unrated countries, the risk weight is capped at 100%. The second option bases the risk weighting on the external credit assessment of the bank itself, with claims on unrated banks being risk-weighted at 50%. Under this option, a preferential risk weight that is one category more favorable may be applied to inter-bank claims with an original maturity⁶³ of three months or less, subject to a floor of 20%, except for banks that are risk weighted at 150%. That is, some preference is still given for very short-term inter-bank loans; even though this preference is linked to the bank's credit rating in Basel II, rather than discriminating against all non-OECD banks.

Claims on securities firms can be treated as claims on banks provided these firms are subject to supervisory and regulatory arrangements comparable to those under this Framework (including, in particular, risk-based capital requirements). Otherwise, such exposures are to follow the rules for claims on corporates.

While the standard risk weight for unrated claims on corporates will be 100%,⁶⁴ the risk weighting of rated corporate claims, (including claims on insurance companies) will be as follows:

Table 2: Risk Weights for Rated Corporate Claims under Basel II

Credit Assessment	AAA to AA-	A+ to A-	BBB+ to BB-	Below BB-	Unrated
Risk weight	20%	50%	100%	150%	100%

At a simpler level, supervisory authorities may, at national discretion, permit banks to risk weight all corporate claims at 100% without relying on external ratings.

Retail exposures are to be risk weighted at a special rate of 75 per cent. This is because such exposures offer a potentially high level of risk diversification if they are sufficiently small and uncorrelated. Two conditions are imposed in order to ensure the latter: No aggregate exposure to a single counterpart can exceed 0.2% of the overall retail portfolio; and the maximum aggregated retail exposure to one counterpart cannot exceed an absolute threshold of €1 million.

In contrast to the 50 per cent risk weight in Basel I, lending secured by mortgages on residential property will now be risk weighted even lower, at 35 per cent. On the other hand, loans secured by mortgages on commercial real estate will receive a specific risk weighting of 100%.

Meanwhile, the following high-risk exposures will be risk weighted at 150% or higher: claims on sovereigns, PSEs, banks, and securities firms rated below B-; claims on corporates rated

⁶³ This specifically means that once the loan is rolled over/extended, it is no longer eligible for this favourable treatment.

⁶⁴ This relatively low risk weight has been assigned to unrated corporations in the Standardised approach, in order to avoid an excessive increase in the cost of borrowing for SMEs.

below BB-; past due loans; other high risk assets, such as venture capital and private equity investments. Securitisation tranches that are rated between BB+ and BB- will be risk weighted at 350%.

Under the Standardised approach, off-balance-sheet items will be converted into credit exposure equivalents through the use of credit conversion factors (CCF), as defined in the 1988 Accord. Counterparty risk weightings for OTC derivative transactions will not be subject to any specific ceiling. However, there are some additional points to be noted. For example, a CCF of 100% will be applied to the lending of banks' securities or the posting of securities as collateral by banks, including instances where these arise out of repo-style transactions (i.e. repurchase/reverse repurchase and securities lending/securities borrowing transactions). Further, with regard to securities, commodities and foreign exchange transactions that have failed, as well as unsettled securities, commodities and foreign exchange transactions, banks must calculate a capital charge according to specified rules. Thus, it is evident that by accounting for banks' involvement in the securities and other financial and non-financial markets, the capital charge under Basel II is bound to be much higher than under the previous one.

The risks due to banks' role as sellers of CRM instruments are treated under the heading of off-balance sheet items, which include contingent claims and such derivatives as are held in the banking book. Contingent claims are converted into their asset equivalents by using a credit conversion factor, which are then treated in the same way as on-balance-sheet exposures. On the other hand, derivatives in the banking book are mostly valued by means of the "current exposure method" as described in Basel I.

Regarding the effect of CRM instruments on banks' own exposures for collateralised transactions, Basel II specifies two alternative approaches to risk weighting, "simple" and "comprehensive". Under the former, the risk weight of the issuer of collateral is substituted for that of the obligor (as in the 1988 Basel Capital Accord); and under the latter, the underlying risk exposures are reduced by a conservative estimate of the value of the collateral. Risks under the "comprehensive" approach due to price volatility and the time needed for liquidation are handled through "haircuts" (reductions in the collateral's value) in accordance with supervisory rules or by banks themselves. After taking account of "haircuts", upto 100 per cent of the collateral can be deducted from the nominal value of the exposure. Meanwhile, the definition of eligible collateral is extended to include certain debt securities not rated by a recognised ECAI. It has been pointed out that since banks in developing countries often give more weight in lending decisions to the provision of collateral than those in advanced economies, with greater flexibility in their categories of assets acceptable as collateral, the increased flexibility in the use of collateral provided in Basel II may be beneficial to them.⁶⁵

⁶⁵ Cornford, 2005a.

The approach to guarantees and credit derivatives⁶⁶ involves substitution of the risk weight of the guarantor or issuer of credit derivatives for that of the obligor. Only credit default swaps and total return swaps that provide credit protection equivalent to guarantees are eligible for the purpose of credit risk mitigation under credit derivatives. The following entities of eligible guarantors (counter-guarantors)/protection providers will be recognised: sovereign entities, PSEs, banks and securities firms with a lower risk weight than the counterparty; other entities rated A- or better. Credit protection provided by parent, subsidiary and affiliate companies when they have a lower risk weight than the obligor is also included. The protected portion is assigned the risk weight of the protection provider. The uncovered portion of the exposure is assigned the risk weight of the underlying counterparty. Where the credit protection is denominated in a currency different from that in which the exposure is denominated — i.e. there is a currency mismatch — the amount of the exposure to be protected will be reduced by the application of a haircut.

Implications of the Standardised Approach

There is consensus that the new rating system proposed in the Standardised approach addresses many of the concerns raised by developing countries about the 1988 Accord and aligns capital requirements more closely with actual risks. In particular, the removal of the OECD/non-OECD distinction is considered a definite improvement and the reduction in the incentive towards short-term lending a step in the right direction.⁶⁷

However, while the preferential risk weighting for domestic currency lending by international banks, funded also domestically, should prove beneficial in reducing foreign exchange risk and thus in preventing sudden capital outflows following a drop in confidence in the country, the downside would be the increased competition for domestic savings between domestic and international banks. This could also both arise from, and lead to, an accentuation of the trend in cross-border mergers and acquisitions (M&As) in the banking sector, with international banks buying local subsidiaries and branches, from which they then lend at smaller risk in local currency, and thus do less cross-border or international lending to developing countries.⁶⁸

⁶⁶ The most common credit derivatives are credit default swaps, total return swaps, and credit-linked notes. A *credit default swap* is a contract under which the buyer of risk (protection seller) receives a premium in return for the obligation to compensate the seller of risk (protection buyer) for financial losses incurred following a “credit event” affecting a financial obligation such as a bond or loan or some other “reference amount”. Under a *total return swap* the seller pays to the buyer of risk, the economic returns and also the risks associated with a set of assets, in return for an amount linked to the cost of funding. This is now a frequently used technique to transfer assets from the balance sheet of the risk buyer (for example, by Enron) which still retains the returns and capital gains on them. The buyer of risk in the case of a credit-linked note is an investor which pays its face value in exchange for a return high enough to take account of the exposure to the risk of a fall in its value due to a “credit event”. Such notes are frequently issued through special purpose entities (SPEs) and linked to the securitisation of assets. Ibid.

⁶⁷ Griffith-Jones, Spratt and Segoviano, 2002, opcit.

⁶⁸ This trend for increased domestic currency lending by international banks has been highlighted by Lubin 2002, Hawkins, 2002, quoted by Griffith-Jones, Spratt and Segoviano, 2002.

Also, the removal of the ceiling (which was 100% across-the-board for all corporate exposures in Basel I) is expected to be of benefit to highly rated corporates in less highly rated countries, regardless of OECD membership. However, the emphasis of the Standardised approach on credit ratings would also imply an increased difficulty in accessing bank financing for unrated corporations, especially for small- and medium-sized companies. In many countries, hardly any external ratings exist for a large part of corporate loans, especially SMEs who most often do not have the wherewithal to obtain ratings from credit assessment agencies; hence, the 100 percent weight will apply to them, making their borrowing more expensive. However, to the extent that loans to SMEs can be classified under retail exposures, which are now subject to reduced risk weights of only 75 percent, SMEs can benefit from lower capital requirements and lower cost of borrowing.

However, Basel II makes the risk weighting for claims on banks, corporates, etc. dependent on the credit rating of their sovereign of incorporation. For example, banks in unrated countries will be risk weighted at not less than 100% (under option 1 for claims on banks), making international financial access for even good banks from unrated countries difficult. Similarly, under option 2 for claims on banks, no claim on an unrated bank may receive a risk weight lower (more favourable) than that applied to claims on its sovereign of incorporation. Given this huge importance of the ratings given to the borrowing countries, one aspect of the standardised approach that has rightly attracted much attention is the proposal to use external credit rating institutions to assign sovereign ratings.

Consequently, there is a concern that instead of mitigating the pro-cyclicality observed under Basel I, Basel II may only exacerbate it. If credit risk responds to indicators correlated with cyclical movements in lending, regulatory capital requirements may exacerbate these movements (through their effects on the price and other terms of lending). Rojas-Suarez (2002) argues that the lateness and the cyclical determination of credit rating agencies' ratings means that ratings improve and capital charges decline during booms, while credit ratings are lowered during the bust, implying higher capital requirements during a recession. Thus, the major credit rating agencies have had a rather poor record in forecasting crises, and there have been widespread instances where ratings downgrades coincided with or even followed deteriorations in creditworthiness which were sometimes associated with crises.⁶⁹ Thus, the Standardised Approach's reliance on credit rating agencies for the assessment of credit risk and for the setting of risk weights does give rise to potential pro-cyclicality.

Powell (2004) points out that the use of external credit ratings can also create potential circularity. This arises from the fact that even as the decision to increase bank lending to a particular sovereign is based on external ratings, the latter themselves are reflections of perceptions of the country's access to international markets to roll over its debts. If the circularity is serious enough, this could spell the difference between being able to roll-over and buying time to adjust, and a very costly default. Given that there are so few international rating

⁶⁹ See Cornford, 2005c, Rojas-Suarez, 2005, Borio, Furfine and Lowe, 2000, etc.

agencies, the change in rating of one agency that moved a country from one rating category to another, may have significant effects. Moreover, by the same token, there may also be a significant cost to one simply getting it wrong.

While the introduction of the ratings by export credit guarantee agencies and their publication have been viewed as helpful in this regard by expanding the range of options available for external ratings, Powell (2004) suggests that an alternative would be to introduce a simplified IRB approach for sovereign credits, whereby banks would simply be asked to use their own ratings but according to a standardized scale. He suggests that as the OECD is doing for the export credit agency ratings, the BIS could collect those ratings across Basel Committee countries and publicize the median ratings for countries and other statistics. This would increase the number of “opinions” still further and possibly lessen the concern on procyclicality. Following similar concerns, Griffith-Jones and Spratt (2002) have also argued that given that international financial stability is a public good, there should be a public element involved in credit rating, rather than private credit agencies. Of the major international financial institutions, the BIS has the best track record in terms of spotting potential crises as well as having financial stability as its main objective, and would be well placed to fulfil this role.

The IRB Approach

Capital Requirements

Under the IRB approach, banks which meet certain minimum conditions and disclosure requirements can obtain supervisory approval to use their internal estimates of risk components to determine the capital requirement for a given exposure. For each of the asset classes covered under the IRB framework, there are three key elements:

- Risk components — estimates of risk parameters provided by banks, some of which are given by the national supervisory authority;
- Risk-weight functions — the means by which risk components are transformed into risk-weighted assets and therefore capital requirements; and
- Minimum requirements — the minimum standards that must be met in order for a bank to use the IRB approach for a given asset class.

The risk-weight functions produce capital requirements for the unexpected loss (UL) portion and are built upon the following risk parameters:

- Probability of default (PD) per rating class, which gives the average percentage of borrowers that default in this rating grade in the course of one year;
- Exposure at default (EAD), which gives an estimate of the amount outstanding in case the borrower defaults; and;
- Loss given default (LGD), which gives the percentage of exposure the bank might lose in case the borrower defaults.

The derivation of risk-weighted assets is dependent on estimates of the PD, LGD, EAD and, in some cases, effective maturity (M), for a given exposure. As already mentioned, for many of the asset classes, the Committee has made available two broad approaches: a foundation and an advanced. Under the foundation approach, as a general rule, banks provide their own estimates of PD and rely on supervisory estimates for the other risk components. Under the advanced approach, banks provide more of their own estimates of PD, LGD and EAD, and their own calculation of effective maturity (M), subject to meeting minimum standards.

The lengthy risk weight formula used for the derivation of supervisory capital charges for unexpected losses (UL) in Basel II is based on a specific model developed by the Basel Committee subject to an important restriction in order to fit supervisory needs. The model is portfolio invariant, i.e. the capital required for any given loan only depends on the risk of that loan and does not depend on the portfolio it is added to.⁷⁰ Given this portfolio invariance, when banks apply such a model type, they use exactly the same risk parameters for EL and UL, namely PD, LGD and EAD. The underlying logic is that when a portfolio consists of a large number of relatively small exposures, idiosyncratic risks associated with individual exposures tend to cancel out one-another and only systematic risks that affect many exposures have a significant effect on portfolio losses.

The expected loss (EL) of a portfolio is assumed to equal the proportion of borrowers who might default (PD) within a given time frame (1 year in the Basel context), multiplied by the outstanding exposure at default (EAD), and once more multiplied by the loss given default (LGD) rate. When LGD is expressed as a percentage of EAD, this works out to be PD multiplied by LGD.

However, in the formula for capital requirement (for UL) or K is calculated as the product of three components: Loss given default (LGD); a second expression related to the conditional probability of default at a specified threshold value *minus* the expected loss at default (PD multiplied by LGD),⁷¹ and a third expression designed to take account of the effect of exposures' maturity.⁷²

The first component, LGD is usually shown as a percentage of EAD, and depends, amongst others, on the type and amount of collateral as well as the type of borrower and the expected proceeds from the work-out of the assets. The second component, conditional PD reflects default

⁷⁰ According to the Basel Committee, this characteristic has been deemed vital in order to make the new IRB framework applicable to a wider range of countries and institutions. In the context of regulatory capital allocation, portfolio invariant allocation schemes are also called ratings-based. Essentially, only so-called Asymptotic Single Risk Factor (ASRF) models are portfolio invariant and the IRB approach is derived based on ASRF. See BCBS, 2005.

⁷¹ Expected loss is to be deducted because there was a consensus in the consultation process in the run up to Basel II that capital adequacy will need to take care of UL alone.

⁷² Capital requirement (K) = [LGD * N [(1 - R)^{-0.5} * G (PD) + (R / (1 - R))^{0.5} * G (0.999)] - PD * LGD] * [(1 - 1.5 x b (PD))⁻¹ × (1 + (M - 2.5) * b (PD))]

rates given an appropriately conservative value of the systematic risk factor. But, all systematic (or system-wide) risks, which affect all borrowers to a certain degree, like industry or regional risks, are modelled with only one systematic risk factor. Diversification or concentration aspects of an actual portfolio are not specifically treated within the model. The degree of the borrower's exposure to the systematic risk factor is expressed by asset correlation. The asset correlations show how the asset value (e.g. sum of all asset values of a firm) of one borrower depends on the asset value of another borrower. The asset correlations are asset class dependent, because different borrowers and/or asset classes show different degrees of dependency on the overall economy. Thus, conditional PD is itself determined by LGD, PD and a term reflecting the correlation (R) of asset values in the exposure category.

The third component represents full maturity adjustment as function of PD and M. Given that long-term credits are riskier than short-term credits, the capital requirement should increase with maturity. Economically, maturity adjustments may also be explained as a consequence of mark-to-market (MtM) valuation of credits. That is, loans with high probability of default (PD) have a lower market value today than loans with low PDs with the same face value, as investors take into account the expected loss, as well as different risk-adjusted discount factors. Thus, the maturity effect would relate to potential down-grades and loss of market value of loans. Consistent with these considerations, the Basel maturity adjustments are a function of both maturity and PD, and they are higher (in relative terms) for low PD than for high PD borrowers.

In order to derive risk weighted assets, K or the capital requirement must be multiplied by EAD and the reciprocal of the minimum capital ratio of 8%, i.e. by a factor of 12.5. Thus,
Risk weighted assets = 12.5 * K * EAD

Asset Classes

Under the IRB approach, banking-book exposures are classified into five broad classes of assets with different underlying risk characteristics: (a) corporate; (b) sovereign; (c) bank; (d) retail; and (e) equity.

Within the corporate asset class, five sub-classes of specialised lending (SL) are identified, which are project finance, object finance,⁷³ commodities finance,⁷⁴ income-producing real estate, and high-volatility commercial real estate (HVCRE). For all these lending classes, the primary source of repayment of the obligation is the income generated by the asset(s) itself, rather than the independent capacity of a broader commercial enterprise. Under the IRB approach for corporate credits, banks are permitted to separately distinguish exposures to SME borrowers from those to large firms. SMEs are defined as corporate exposures, where the reported sales for

73 In this case, the physical assets financed – such as ships, aircraft, or satellites – are expected to be the principal source of debt service.

74 This refers to structured short-term lending to finance reserves, inventories, or receivables of exchange-traded commodities (e.g. crude oil, metals, or crops), where the exposure will be repaid from the proceeds of the sale of the commodity and the borrower has no independent capacity to repay the exposure.

the consolidated group of which the firm is a part, is less than €50 million. A firm-size adjustment is made to the corporate risk weight formula for exposures to SME borrowers.⁷⁵

The sovereign asset class includes sovereigns (and their central banks), certain PSEs identified as sovereigns in the standardised approach, MDBs that meet the criteria for a 0% risk weight under the Standardised approach, the BIS, the IMF, the European Central Bank and the European Community. On the other hand, the bank asset class covers exposures to banks and those securities firms that are subject to supervisory and regulatory arrangements comparable to those under this Framework (including, in particular, risk-based capital requirements). Bank exposures also include claims on domestic PSEs that are treated like claims on banks under the standardised approach, and MDBs that do not meet the criteria for a 0% risk weight under the Standardised approach.

For corporate, sovereign and bank exposures, under the foundation approach, banks must provide their own estimates of PD associated with each of their borrower grades, but must use supervisory estimates for the other relevant risk components LGD, EAD and M.⁷⁶ Under the advanced approach, banks must calculate the effective maturity (M) and provide their own estimates of PD, LGD and EAD. There is an exception to this general rule for the five sub-classes of assets identified as SL. HVCRE exposures are singled out for a separate risk-weight function under both foundation and advanced approaches, given the role often played by speculative property development in financial booms and busts. In the case of banks which do meet the requirements for estimating PD under the IRB approach, the correlation term in the factor K is increased for HVCRE, thus raising its risk weight owing to HVCRE's lower risk diversification.

Equity exposures include both direct and indirect ownership interests, whether voting or non-voting, in the assets and income of a commercial enterprise or of a financial institution that is not consolidated or deducted from regulatory capital. While risk-weighted assets for equity exposures in the trading book are subject to the market risk capital rules, there are two broad approaches to calculate risk-weighted assets for equity exposures not held in the trading book: a market-based approach and a PD/LGD approach.

⁷⁵ Following widespread criticism that the IRB approach in an earlier version would have led to an increase in the cost of funding for SMEs, the formula for K was adjusted. Thus, in addition to being an exponentially decreasing function of PD, correlations are adjusted to firm size, which is measured by annual sales. For borrowers with €5 mn or less annual sales, the size adjustment takes the value of 0.04, thus lowering the asset correlation from the existing 24% to 20% (for best credit quality) and from 12% to 8% (for worst credit quality). However, the asset correlation function for bank and sovereign exposures is the same as for corporate borrowers, without the size adjustment.

⁷⁶ LGD must be measured as the loss given default as a percentage of the EAD. There are two approaches for deriving this estimate: a foundation approach and an advanced approach. Under the foundation approach, senior claims on corporates, sovereigns and banks not secured by recognised collateral will be assigned a 45% LGD. All subordinated claims on corporates, sovereigns and banks will be assigned a 75% LGD. Under the advanced approach, supervisors may permit banks to use their own internal estimates of LGD for corporate, sovereign and bank exposures, subject to certain additional minimum requirements.

Under the market-based approach, institutions are permitted to calculate the minimum capital requirements for their banking book equity holdings using one or both of two separate and distinct methods: a simple risk weight method or an internal models method. Under the simple risk weight method, a 300% risk weight is to be applied to equity holdings that are publicly traded and a 400% risk weight is to be applied to all other equity holdings. IRB banks may also use, or may be required by their supervisor to use, internal risk measurement models to calculate the risk-based capital requirement. However, capital charges calculated under the internal models method may be no less than the capital charges (at the individual exposure levels) that would be calculated under the simple risk weight method using a 200% risk weight for publicly traded equity holdings and a 300% risk weight for all other equity holdings.

The PD/LGD approach to equity exposures is to be used by banks that adopt the advanced approach for other exposure types. The minimum requirements and methodology for the PD/LGD approach for equity exposures (including equity of companies that are included in the retail asset class) are the same as those for the IRB foundation approach for corporate exposures subject to certain specifications.⁷⁷

Importantly, to promote specific sectors of the economy, supervisors may exclude from the IRB capital charges, equity holdings made under legislated programmes that provide significant subsidies for the investment to the bank and involve some form of government oversight and restrictions on the equity investments. For example, restrictions such as limitations on the size and types of businesses in which the bank is investing, allowable amounts of ownership interests, geographical location and other pertinent factors that limit the potential risk of the investment to the bank, etc. However, such equity holdings can only be excluded from the IRB approaches up to an aggregate of 10% of Tier 1 plus Tier 2 capital, and therefore may not provide much of an incentive.

Holdings in funds containing both equity investments and other non-equity types of investments can be either treated, in a consistent manner, as a single investment based on the majority of the fund's holdings or, where possible, as separate and distinct investments in the fund's component holdings.

Retail exposures are classified into three subclasses: (1) residential mortgage loans, (2) qualifying revolving retail exposures (QRREs) (revolving, unsecured exposures to individuals with a value up to €100,000, which would include much credit-card business), and (3) other retail exposures (which can include loans to SMEs up to a ceiling of €1 million). It has been pointed out that to the extent that banks in developing countries use the IRB approach, a higher proportion of lending to SMEs than in developed countries may be covered under the category, "other retail", than under the SME version of corporate exposures.⁷⁸ There are three separate risk-weight functions for retail exposures. However, there is no distinction between a foundation and advanced approach for retail exposures.

⁷⁷ An LGD of 90% would be assumed in deriving the risk weight for equity exposures.

⁷⁸ See Cornford, 2005a.

Credit Risk Mitigation

There are two approaches for recognition of credit risk mitigation techniques in the form of guarantees and credit derivatives in the IRB approach: a foundation approach for banks using supervisory values of LGD, and an advanced approach for those banks using their internal estimates of LGD. Eligible collateral includes commercial and residential property meeting certain restrictions, but it has also been extended to other receivables and physical collateral for which easily identifiable prices exist.

For banks using the foundation approach for LGD, the approach closely follows the treatment under the Standardised approach. The focus of the treatment of credit risk mitigation under the IRB approach is on the effects of risk transfer associated with different techniques on banks' underlying exposures. In the advanced approach for estimating LGDs, the risk mitigating effect of guarantees and credit derivatives are reflected through either adjusting PD or LGD estimates. As such, to the extent that the CRM is recognised by the bank, the adjusted risk weight will not be less than that of a comparable direct exposure to the protection provider.

Contingent claims or positions due to banks' sale of instruments for credit risk mitigation to other counterparties (to the extent that they are carried in the banking as opposed to the trading book) are converted by multiplication of their nominal value by a credit conversion factor in order to estimate the asset equivalents.

After setting out the definitions of the various classes of assets and describing the formula for the derivation of risk-weighted assets for each of those classes, the Accord sets forth in detail the minimum requirements for banks adopting the IRB approach. The minimum requirements are set out in 12 separate sections concerning: (a) composition of minimum requirements, (b) compliance with minimum requirements, (c) rating system design, (d) risk rating system operations, (e) corporate governance and oversight, (f) use of internal ratings, (g) risk quantification, (h) validation of internal estimates, (i) supervisory LGD and EAD estimates, (j) requirements for recognition of leasing, (k) calculation of capital charges for equity exposures, and (l) disclosure requirements.

Securitisation

Recognising the growing role played by securitisation in bank operations, Basel II requires banks to hold regulatory capital against all of their securitization exposures, including those arising from the provision of credit risk mitigants to a securitisation transaction, investments in asset-backed securities, retention of a subordinated tranche, and extension of a liquidity facility or credit enhancement,⁷⁹ etc. However, the attempt by the Basel Committee to ensure that the

⁷⁹ A credit enhancement is a contractual arrangement in which the bank retains or assumes a securitisation exposure and, in substance, provides some degree of added protection to other parties to the transaction.

capital requirements for securitisation exposures reflect their credit risks has led to a set of highly complex rules corresponding to such transactions and structures. The section dealing with securitisation includes an extended treatment of definitions, which then serves as the basis for setting conditions defining the degree of risk transfer achieved. It considers both “traditional” and “synthetic” securitisations, as well as similar structures that contain features common to both. Securitisation exposures can include but are not restricted to the following: asset-backed securities, mortgage-backed securities, interest rate or currency swaps, credit derivatives, etc. Again, the underlying instruments in the pool being securitised may include, but not exclusively, the following: loans, commitments, asset-backed and mortgage-backed securities, corporate bonds, equity securities, and private equity investments. The underlying pool may include one or more exposures.

Banks applying the Standardised approach to categories of underlying exposures must also apply the Standardised approach to securitisation exposures for these categories. The rules for many securitisation exposures are similar to those for the attribution of risk weights under the Standardised approach for non-securitised positions, though the weights corresponding to the ratings of the ECAIs differ. Banks applying the IRB approach to categories of underlying exposures must also apply the IRB approach to securitisation exposures for these categories. For a bank using the IRB approach to securitisation, the maximum capital requirement for the securitisation exposures it holds will not be more than the IRB capital requirement that would have been assessed against the underlying exposures, had they not been securitised.

Under the IRB approach, there is a hierarchy of options. The first in the hierarchy, Ratings-Based Approach (RBA), is used when the exposures are rated by an ECAI or when a rating can be inferred in accordance with certain requirements. Where an external or an inferred rating is not available, either the Supervisory Formula (SF) or the Internal Assessment Approach (IAA) must be applied. The IAA is only available to selected exposures (e.g. liquidity facilities and credit enhancements) linked to asset-backed commercial paper, which lack external credit ratings but to which banks attribute internal ratings equivalent to investment grade. These internal assessments would then be used to assign risk weights corresponding to the equivalent RBA-based weight. The third in the hierarchy, the SF, is also intended for cases when external or inferred ratings are not available or possible. Under the SF, the capital charge for a securitisation tranche depends on five bank-supplied inputs: the IRB capital charge, had the underlying exposures not been securitised; the tranche’s credit enhancement level and thickness; the pool’s effective number of exposures; and the pool’s exposure-weighted average loss-given-default (LGD). The risk-weighted assets generated through the use of the SF are calculated by multiplying the capital charge by 12.5.

Operational Risk

As mentioned already, the setting of capital charges for operational risk has been one of the significant new features of the revision of the 1988 Basel Capital Accord. Under the simplest (Basic Indicator) approach, the capital charge for operational risk would be equal to 15 per cent of the bank’s positive annual gross income averaged over the previous three years. While there

is no specific criteria for the use of this approach, banks using this approach are encouraged to comply with the Committee's guidance on *Sound Practices for the Management and Supervision of Operational Risk*, February 2003.

Under the second option, the Standardised approach, a bank's activities are divided into eight business lines, namely, corporate finance, trading and sales, retail banking, commercial banking, payment and settlement, agency services, asset management, and retail brokerage. Each of these is assigned a factor, β_i , which relates the operational risk of line i to its gross income. The capital charge is then the sum over i of β_i multiplied by gross income of business line i .

Under the most sophisticated Advanced Measurement Approach (AMA), the capital charge is generated by the bank's internal system for measuring operational risk (subject to its meeting specified supervisory criteria). Banks will be allowed to adopt AMA for some parts of its operations and the Basic Indicator or Standardised approach for the rest. Under the AMA, a bank will be allowed to recognise the risk mitigating impact of insurance in the measures of operational risk used for regulatory minimum capital requirements. The recognition of insurance mitigation will be limited to 20% of the total operational risk capital charge calculated under the AMA.

In order to utilize two of the more advanced approaches in measuring risk, banks will be required to meet certain criteria such as: establishing an independent operational-risk unit responsible for design and implementation of internal controls, reporting results to management, documenting the bank's risk-management system, and actively involving the board of directors and senior management. Supervisors will be required to conduct independent evaluations of banks' operational-risk management frameworks. These measures required under Basel II are, in essence, measures to protect and enforce the internal integrity of banking organizations.

Trading Book Issues

The section on trading book issues covers definitions, guidance on valuation of items in the trading book, and revisions of the provisions of the 1996 Market Risk Amendment regarding the specific market risk and the credit risk of certain items in the trading book. Under the heading of specific market risk, it sets the rules for specific-risk capital charges for positions hedged with credit derivatives. Trading book is defined in Basel II as financial instruments and commodities held either with a trading intent or to hedge other elements of the trading book. This definition is expected to help prevent regulatory arbitrage through shifting items between the trading and banking books to minimise capital charges and to assist supervisors in assigning new financial instruments such as credit derivatives to one or the other. Further consideration of these issues is to be expected in the Trading Book Review being undertaken jointly by the BCBS and the International Organisation of Securities Commissions (IOSCO).

Overall, Pillar 1 of Basel II proposes a much more sophisticated and detailed structure, not only in the types of risks incorporated for calculating capital requirements, but also in the range of asset classes as well as risk weighting. A large part of the complexity has also been due to the

menu of options provided with different approaches for the measurements of credit risk, operational risk, securitization, etc., in an attempt to set global standards for the regulatory capital of banks at different levels of sophistication. It has also reflected the Basel Committee's response to continuing rapid financial innovation and evident weaknesses of existing regulations, which has led, as Cornford (2005a) points out, to some proposed rules whose variety and complexity sometimes match those of the practices they are intended to regulate. As such this makes ensuring minimum CAR a much more complicated exercise for central banks than in the original Accord.

Pillar 2: Supervisory Review

The supervisory review process of the Framework is intended not only to ensure that banks have adequate capital to support all the risks in their business, but also to encourage banks to develop and use better risk management techniques in monitoring and managing their risks. The Committee has identified four key principles of supervisory review, which are to complement those outlined in the extensive supervisory guidance that has been developed by the Committee, the keystone of which is the Core Principles for Effective Banking Supervision and the Core Principles Methodology.⁸⁰ The four principles are:

Principle 1: Banks should have a process for assessing their overall capital adequacy in relation to their risk profile and a strategy for maintaining their capital levels.

Principle 2: Supervisors should review and evaluate banks' internal capital adequacy assessments and strategies, as well as their ability to monitor and ensure their compliance with regulatory capital ratios. Supervisors should take appropriate supervisory action if they are not satisfied with the result of this process.

Principle 3: Supervisors should expect banks to operate above the minimum regulatory capital ratios and should have the ability to require banks to hold capital in excess of the minimum.

Principle 4: Supervisors should seek to intervene at an early stage to prevent capital from falling below the minimum levels required to support the risk characteristics of a particular bank and should require rapid remedial action if capital is not maintained or restored.

There are three main areas that are pointed out by the Committee as particularly suited to treatment under Pillar 2: risks considered under Pillar 1 that are not fully captured by the Pillar 1

⁸⁰ The Financial Stability Forum (FSF) was established by BIS and the Basel Committee in 1999, in the aftermath of the East Asian financial crisis, to assist financial supervisors around the world. One of its mandates has been to provide a body of "best practices" pooled from different international standard setting bodies and regulatory frameworks related to the institutional framework of financial systems. Of these, the Core Principles for Effective Banking Supervision has become the most important global standard for prudential regulation and supervision in the financial sector, with a vast majority of countries endorsing them. The Basle Core Principles comprise twenty-five basic Principles that need to be in place for a supervisory system to be effective. The Principles relate to: Preconditions for effective banking supervision, Licensing and structure, Prudential regulations and requirements, Methods of ongoing banking supervision, Information requirements, Formal powers of supervisors and Cross-border banking. See BCBS, 1997.

process (e.g. credit concentration risk)⁸¹; those factors not taken into account by the Pillar 1 process (e.g. interest rate risk in the banking book,⁸² business and strategic risk); and factors external to the bank (e.g. business cycle effects). The treatment here is devoted to particular problems under the different headings which may in some cases indicate the need for capital charges in addition to those assessed in accordance with the rules of Pillar 1. A further important aspect of Pillar 2 is the assessment of compliance with the minimum standards (for example, stress tests) and disclosure requirements of the more advanced methods in Pillar 1, in particular the IRB framework for credit risk and the Advanced Measurement Approaches for operational risk. Supervisors must ensure that these requirements are being met, both as qualifying criteria and on a continuing basis. The enormous supervisory capabilities in terms of physical and human resources such compliance assessment calls for, implies that premature adoption of Basel II in countries with limited capacity could inappropriately divert resources from more urgent day-to-day supervisory priorities, ultimately weakening rather than strengthening supervision.

Other aspects of the supervisory review process include supervisory transparency and accountability, enhanced cross-border communication and cooperation, supervisory review process for securitization, etc. The latter include ensuring the significance of the risk transfer carried out through securitization, monitoring market innovations, residual risks, etc. Importantly, it has been pointed out by the Basel Committee that as the minimum capital requirements for securitisation may not be able to address all potential issues, supervisory authorities are expected to consider new features of securitisation transactions as they arise. Such assessments would include reviewing the impact of new features on credit risk transfer and, where appropriate, supervisors will be expected to take appropriate action under Pillar 2. A Pillar 1 response may be formulated to take account of market innovations and may take the form of a set of operational requirements and/or a specific capital treatment.

Recognising that cross-border supervision of complex international banking groups require enhanced cooperation between various national supervisors, Pillar 2 sets out the following division of labour between home and host supervisors. While the home country supervisor is responsible for the oversight of the implementation of the Framework for a banking group on a consolidated basis; host country supervisors are responsible for supervision of those entities operating in their countries.

⁸¹ Risk concentration arises when any single exposure or group of exposures with the potential to produce losses large enough (relative to a bank's capital, total assets, or overall risk level) to threaten a bank's health or ability to maintain its core operations. In the course of their activities, supervisors should assess the extent of a bank's credit risk concentrations, how they are managed, etc.

⁸² The revised guidance on interest rate risk recognises banks' internal systems as the principal tool for the measurement of interest rate risk in the banking book and the supervisory response. To facilitate supervisors' monitoring of interest rate risk exposures across institutions, banks would have to provide the results of their internal measurement systems.

Pillar 3: Market Discipline

Given that the reliance on internal methodologies under the Revised Framework gives banks more discretion in assessing capital requirements, the Basel Committee intends market discipline under Pillar 3 to complement the supervisory review process in contributing to a safe and sound banking environment. The Committee has gone about this by developing a set of disclosure requirements which will allow market participants to assess key pieces of information on the capital adequacy of the institution. Banks are required to have a formal disclosure policy approved by the board of directors, which addresses the bank's approach for determining what disclosures it will make and the internal controls over the disclosure process. In addition, banks should implement a process for assessing the appropriateness of their disclosures, including validation and the frequency of them.

The framework sets out qualitative and quantitative disclosure requirements for the scope of application, capital structure and capital adequacy, general disclosures for all banks for credit risk, disclosures for portfolios subject to the standardised approach and supervisory risk weights in the IRB approaches, disclosures for portfolios subject to IRB approaches, credit risk mitigation, counterparty credit risk, securitisation, market risk, operational risk, banking book equity positions, and interest rate risk in the banking book. Pillar 3 applies at the top consolidated level of the banking group to which this Framework applies. However, disclosures related to individual banks within the groups would not generally be required to fulfil the disclosure requirements set out.

Implications for Developing Countries

With the release of the Basel II text, national authorities in the G10 countries are now working to adopt the Basel II text through domestic rule-making and approval processes, as they are bound to implement the Revised Framework from 2007 onwards. However, while no country is legally obliged to implement it locally since it is meant for only internationally active banks, the new Accord devised by G-10 countries may also become binding on non-G10 countries for a variety of reasons given below.

Given that the supervisory review under Pillar 2 is expected to complement the Core Principles for Effective Banking Supervision and that the IMF's Article IV surveillance assesses the compliance of countries with the Core Principles, Basel II will also become a part of the review. Similarly, as earlier mentioned, conditionalities for multilateral official development assistance for developing countries and LDCs as well as pre-qualification conditions for Contingent Credit Lines are also made conditional upon the prior implementation of these inflexible "core" codes and standards. However, the IMF has recently sought to clarify that in their assessments of a country's compliance with the Basel Core Principles, the Fund and the World Bank will not assess compliance based on whether or not a country has implemented Basel II. It is emphasised that the choice of which capital standard to adopt must be made by national authorities. Bank/Fund assessments of supervision will be against the capital standard (Basel I, Basel II, or

other forms) chosen by the country in the context of the country's capacity and sound international practice.⁸³ In this regard, the Fund has noted the weak compliance across countries with many of the existing Basel Core Principles that are important to the effective implementation of Basel II and have suggested that many countries may benefit more in the short term from a strengthening of supervisory practices as set out under Pillar 2, and from an enhancement of banks' disclosure practices under Pillar 3 to facilitate the exercise of market discipline. Even so, the emphasis put by the Fund on capacity building, technical assistance and infrastructure build up towards gradual phasing-in points towards the impending pressure on developing and less developed countries to progressively move over to Basel II.⁸⁴

The Basel Committee has offered great flexibility, under which banks could adopt "a phased rollout of the IRB approach", for example, adopting the IRB approach across asset classes within the same business unit or across business units within the same banking group, or moving from the foundation to the advanced version only for some inputs to risk-weighted assets, etc. Some analysts expect that this flexibility will facilitate adoption of the IRB approach by less sophisticated banks and is thus likely to be applied in several developing countries. Indeed, according to a survey carried out by the Financial Stability Institute (FSI), by 2009, that is, in less than three years, banks representing 50 per cent or more of total assets in all regions (except the Caribbean) covered by the questionnaire, expect to be using the foundation version of the IRB approach. However, by 2015, 25 per cent or more of banking assets are expected to be covered by banks using the advanced version of the IRB approach in Africa, Latin America and non-BCBS Europe.

At another level, even as the Basel Committee offers the flexibility between the Standardised and the IRB approaches, the mutual recognition for internationally active banks as a key basis for international supervisory co-operation under Pillar 2 specifically means, in its own words, "recognising common capital adequacy approaches when considering the entities of internationally active banks in host jurisdictions, as well as the desirability of minimising differences in the national capital adequacy regulations between home and host jurisdictions so that subsidiary banks are not subjected to excessive burden" (Paragraph 783). The home country supervisor is to lead this coordination effort in cooperation with the host country supervisors.⁸⁵ This implies that more crucially, the drive towards Basel II implementation under the current

⁸³ Conscious of its reputation, the IMF directors have actually cautioned that "Fund staff should avoid conveying the perception that countries will be criticized for not moving to adopt the Basel II framework". See IMF, 2005, Executive Board Discusses Implications of the New Basel Capital Adequacy Framework for Banks, available at <http://www.imf.org/external/np/sec/pn/2005/pn05154.htm>

⁸⁴ For countries seeking to implement Basel II, the division of labour has been laid out: technical assistance provided by the IMF will be closely coordinated with the members of the Basel Committee on Banking Supervision and other relevant standard setters. On the other hand, the Fund will bear primary responsibility for financial stability issues and the supervisory framework and practices, while the World Bank will be primary responsible for financial sector infrastructure and institutional development. *Ibid.*

⁸⁵ However, this very emphasis towards homogenization is bound to create serious problems in achieving coordination of home- and host-country supervisors regarding cross-border implementation of Basel II, due to the variation in regulatory capital requirements mandated under different approaches, as we will discuss in a following section.

globalised financial sectors will likely come from the multinational banks' demand for homogenization of standards and approaches across their various host countries. Many emerging economies have foreign banks from Basel Committee countries operating in their jurisdictions. These are precisely the internationally active banks that will be implementing the more advanced approaches of Basel II on a worldwide, consolidated basis. Indeed, the FSI survey draws special attention to the role of foreign banks in the implementation of Basel II, going so far as to characterise them as "major drivers" of the process in several regions.⁸⁶ It points out that much of the initial impetus for the adoption of Basel II is expected to come from foreign-controlled banks, with one-third of the banking assets in non-BCBS Europe, the Middle East and Latin America and almost all of those in the Caribbean moving to Basel II by the end of 2009 being those of foreign-controlled banks.

Thus, even as the Basel Committee has extended the transition period for implementation of the more advanced approaches for developing countries to the end of 2007, the implementation process will likely take on a momentum of its own. The drive towards implementation will also come from the negotiations on financial services under the WTO GATS. Given the growing presence of foreign banks in many developing countries, it is likely that the new Accord will therefore enter into the Mode 3 negotiations in financial services.

However, this drive towards implementation is in complete disregard of the serious issues that have been raised regarding the adverse implications of Basel II. Even though there are problems with the Standardised approach especially with the use of external credit ratings discussed earlier, the IRB approach is predicted to have more serious implications for many developing country borrowers. On balance, as Griffith-Jones and Spratt (2002) have opined, the net impact of the new Accord on developing countries would be determined by the extent to which the IRB approach comes to dominate the banking industry's relations with the developing world.

Several important concerns have been raised regarding the impact of Basel II on the cost and level of borrowing for smaller and lower rated borrowers including developing countries (for a variety of reasons); the increase in pro-cyclicality of the financial system which the new approach will lead to; decline in banking sector competition; etc. These are in addition to general problems such as the high cost of compliance and implementation, the difficulty that market discipline under Pillar 3 may not work in the desired manner; etc. The most important lacuna will be that the basic problem of ensuring banking sector soundness and financial stability may not be addressed, in spite of the Basel Committee's attempt to catch up with industry practices. We address these issues in some detail below.

⁸⁶ The data from a survey conducted by the Financial Stability Institute (FSI) indicate that within a period of less than a decade, the regulatory authorities of the countries responsible for most global banking activity expect to implement Basel II. Eighty-eight of the 107 respondents, which represent 87 per cent of the total banking assets of these countries, intend to implement Basel II. If BCBS countries are added to this total, this means that over 100 countries expect to implement Basel II. For region-wise discussion of the results of the survey, see Cornford, 2005c.

Cost of Borrowing

There has been widespread criticism that the calibration of high-risk grades in the IRB approach causes regulatory minimum capital requirements to increase to inappropriately high levels when compared to existing rules or even in comparison to banks' internal risk models. The logic of this argument is that if the regulatory requirements are above those indicated by the banks' own models, to the extent that higher regulatory capital requirements feed through into the pricing of loans, these changes will cause the pricing of loans to lower-rated borrowers – disproportionately concentrated in developing countries – to rise significantly from their current levels. Thus, Basel II creates the risk of a sharp reduction in bank lending to developing countries and of an increase in the cost of a significant part of the remaining lending, particularly in the case of low-rated borrowing countries, which also have a limited or costly access to international bond markets. This is supported by simulation exercises which show that the bulk of emerging and developing countries who would fall under the speculative-grade, will suffer from a dramatic rise in debt costs under the IRB approach.⁸⁷

A counter argument has been that bank lending rates to emerging market and developing countries already incorporate the risk premium. But, it is likely that the said risk premium will go up further. Based on a selection of countries in Latin America for which Emerging Market Bond Index (EMBI) spreads and (Standard & Poor's) ratings were available, Powell (2004) has shown that the effect of Basel II on emerging markets' cost of capital are very sensitive to the values for default probability (PD) and LGD (loss given default) assigned for each sovereign. Indeed, for two countries in the sample with the lowest credit rating (Venezuela and Ecuador), the IRB approach resulted in much higher spreads.

It has also been pointed out that although the size adjustment made to the risk weight formula to reduce the regulatory disincentive towards SME lending would be beneficial for cheaper (compared to an earlier IRB version) domestic lending to SMEs in developed countries (because the majority of their banks are likely to move to an IRB approach), it would not affect international lending to developing countries positively, unless international banks lend to developing countries' SMEs on a cross-border basis, which is highly unlikely.⁸⁸

In fact, in the Indian context, Sen and Ghosh (2005) has shown that higher risk weight for SMEs has already been one of the central factors explaining the decline in credit to SMEs, which have potentials for repayment capacity as well as growth.⁸⁹ Supplementary finance, as available from outlets like the Small Industries Development Bank of India (SIDBI), cooperative banks or even fiscal measures have not filled in the void that is left in terms of the unfulfilled demand for finance on the part of SMEs. Based on this, they have argued that since Basel II would further

⁸⁷ See Reisen, 2001 quoted in Rojas-Suarez, Liliana, 2002, Griffith-Jones and Spratt, 2002, etc.

⁸⁸ See Griffith-Jones, Spratt and Segoviano, 2002.

⁸⁹ See Sen and Ghosh, 2005.

bias the sectoral deployment of credit in the country in favour of higher-rated borrowers, its implementation in the Indian banking industry points to possible contractionary effects.

Clearly then, as Griffith-Jones, Spratt and Segoviano (2002) have argued, it is very important to allow international banks' subsidiaries in developing countries to continue to use the Standardised Approach on a permanent basis, and not be compelled to move to the IRB approach. This would diminish uncertainty about the capital requirements such banks would face, and remove the possibility of a large proportion of the banking system in poorer countries having an incentive to concentrate their lending on higher-rated borrowers.

Another channel through which Basel II will increase the cost of borrowing for developing countries is by way of its impact on trade and commodity financing. Upto 95 per cent of international commodity trade finance is currently provided in the form of bank lines to mid-sized trading houses. Since very few of these have any formal debt ratings and those that have are rarely investment-grade, many banks base their lending decisions on long-standing relationships and domain knowledge. But, this will no longer be sufficient under Basel II. According to an UNCTAD (2006) report, even though trade finance has an extremely low risk profile historically, it will become more expensive under Basel II because of: the new operational risk capital (since processing and handling of trade documents carry higher operational risk); the heavier weighting of the outstanding capital-at-risk of short-term lines of credit under the Advanced IRB approach (since short-term self-liquidating lines of credit will be riskweighted at 100 per cent as opposed to 20 per cent under Basel I); and the higher credit risk capital requirements (since Basel II requires at least 2.5 as much capital as Basel I for sub-investment grade exposure). In addition, the manner in which commodity finance (under specialised lending) is restricted to exchange-traded commodities will eliminate many well-structured deals for products such as fruits, vegetables, flowers, fisheries or diamonds from a "commodity finance" treatment. The UNCTAD study has rightly pointed out that this will hinder developing countries' diversification efforts. Further, Basel II is also likely to disrupt the syndicated loan market, which is now quite significant for a number of developing country commodity exporters. This would arise from the serious difficulties which banks would face in coming to an agreement on interest rates and deal structure, when each of the banks involved may have different provisioning requirements depending on whether they follow the Standardised or the IRB approaches.

The emphasis on disclosures under Pillar could also lead to risk-averse behaviour on the part of banks. It has been observed that banks that are perceived as riskier because they hold larger amounts of non-performing loans are "punished" by the market with higher borrowing costs. In fact, banks that have greater fee-based income, as reflected in higher off-balance sheet activities, are perceived to be less risky and consequently, face lower borrowing costs.⁹⁰ Thus, "market discipline" may also motivate banks to select high capital adequacy ratios as a means of

⁹⁰ See Ghosh and Das, 2005.

lowering their borrowing costs. This would also translate into reduced access or/and higher cost of borrowing for lower-rated borrowers.

No Portfolio Diversification Benefits

A second problem is that under the IRB approach, the benefits of international diversification are not taken into account at the portfolio level, and therefore, capital requirements for loans to developing countries will be significantly higher than is justified on the basis of the actual risks attached to this lending.

As we discussed earlier, the underlying models used for the calibration of risk weight function under the IRB approach assumes that there is a single systematic risk factor, and that this factor is the same across all loans. While the underlying assumption is that the risk weight functions are standardised for well diversified banks, perhaps only one or two banks can be described as fully internationally diversified. However, the correlation terms of the IRB approach can only take account of diversification effects within the categories of assets specified and not across different borrower classes.

Domestically and internationally, diversification benefits could play a major role for banks concentrating in below investment-grade borrowers – either SMEs or developing countries. Griffith-Jones, Spratt and Segoviano (2004) have shown on the basis of empirical testing that credit risk models that incorporate these effects produce capital requirements that are on average 20% lower than those produced by the IRB approach, where diversification effects are not taken into account. If a correcting factor of around 20% was introduced into the IRB approach, there could be an error of around 4% maximum; but if it is not introduced, the error could be as high as 24%. Thus, if diversification benefits were to be sufficiently recognised, there might be incentives – in terms of lower overall capital requirements - for portfolio diversification: for example, between developed and developing countries internationally. Clearly a well-diversified bank is also likely to be a more stable bank than one that is more geographically focused. It is also likely that more extensive diversification will have a dampening effect on pro-cyclicality. Thus, the incorporation of the benefits of diversification would also have the positive effect of mitigating pro-cyclicality in lending patterns.⁹¹ For the reasons outlined above, it would have been appropriate to make a similar adjustment to the IRB function for international diversification, to take account of lower correlation, for example between developed and developing countries' risk.

The concerns expressed by politicians in certain developed countries and by one category of borrowers (SMEs in certain developed countries, especially Germany) about the high levels of capital requirements delivered by the IRB risk functions for SMEs encouraged modifications in this area. Indeed, as Griffith-Jones, Spratt and Segoviano (2004) have been right to point out, if special treatment is being given to SMEs mainly because of political pressure from those

⁹¹ Griffith-Jones, Spratt and Segoviano, 2004.

developed countries where SMEs generate important employment effects, some special treatment should be given for lending to developing countries, which generate such a high proportion of global employment.

However, the Basel Committee's justification is that taking into account the actual portfolio composition when determining capital for each loan - as is already done in more advanced credit portfolio models - would have been too complex a task for most banks and supervisors alike. Given the fact that the IRB approach has been designed and intended, in the first place, to be adopted only by the largest and the most sophisticated banks with the advanced credit risk models, this reasoning does not stand. Further, incorporating the benefits of international diversification would not have been more complex than the flattening of the IRB curve for SMEs. That the Basel Committee has not chosen to do this and has maintained a model that is economically damaging for developing countries has therefore been linked to the fact that developing countries do not have any formal representation in the Committee, which is an ad hoc voluntary body with a non-transparent governance structure. As a result, the large financial institutions domiciled in the developed countries represented on the Committee seem to have exerted excess influence in the decision making process to their own benefit.⁹²

The Committee has left the issue to be addressed under Pillar 2 of the framework, where the supervisory review process is expected to adjust capital requirements in the light of the degree of diversification in a bank's loan portfolio. However, the lack of recognition of portfolio diversification effects directly in the model remains a serious fault of the Revised Accord which was supposed to more accurately align regulatory capital with the actual risks faced by banks. This could have a significant adverse impact on international lending to developing countries and lead to negative economic consequences. The lack of recognition of portfolio diversification effects could also have negative implications for systemic stability.

Competitive Effects on the Banking Sector

It has been pointed out that the asymmetric treatment of small and large banks implied by the coexistence of the standardized and the IRB approaches and banks' ability to choose between them also has a cost increasing effect on small borrowers, as well as has the potential effect of reducing competition within the banking sector.

In general, a bank must adopt either the Standardised or IRB approach for most of its exposures, including its securitisation exposures. As incentives for adopting the more advanced approaches for credit and operational risks, banks are anticipated to experience lower capital requirements and therefore lower costs under these approaches.⁹³ However, except for the largest banks

44 See Griffith-Jones and Persaud (2004) Kregel (2006).

⁹³ In order to guard against the misuse of the advanced approaches, the Committee believes that prudential capital floors should be applied to ensure that individual bank implementations of the advanced approaches are sound. For instance, during the first year following implementation (2007), the IRB capital requirements may not fall below 90% of the current minimum required for credit and market risks. Similarly, during the second year following implementation (2008), the IRB capital requirements may not fall below 80% of the current minimum required for credit and market risks.

especially in developed countries, there is limited experience in assessing the risks on IRB similar lines. Indeed, the United States has announced that it was going to limit Basel II's application to the country's major international banks, the remainder of the sector being permitted to continue to operate under the rules based on the 1988 Basel Accord.

Further, for most developing country banks, a complex analytical approach and detailed and frequent reporting systems cannot easily be justified when the amounts of such business, particularly in the newer, more innovative instruments, are only small. The lack of sufficient historical data may also make the use of the IRB approach unfeasible for smaller banks. The implementation of the IRB approach also requires large initial investments in sophisticated risk management technologies. All these factors may deter smaller and less sophisticated banks from using the IRB approach. In this situation, small banks will not benefit from the decrease in capital requirements for relatively safe exposures, while large banks will profit from the reduction in capital requirements (and hence marginal costs) for safe loans in the IRB approach. This gives the latter a competitive advantage over small banks. This distorts competition, benefiting the larger banks, which may increase deposit rates to attract more deposits and exploit the higher profitability of investments.⁹⁴ The fiercer competition for deposits may induce the small banks to raise their deposit rates as well, in order to recapture some of their market shares. At this higher rate, small banks may prefer a risky investment strategy over a safe one.

There are three implications arising from this according to Hakenes and Schnabel (2006). Starting from a situation where all banks choose a safe investment strategy, this implies an increase in aggregate risk. Hence, the new accord may actually destabilize the banking system, contrary to the regulators' intention and lead to an increase in aggregate risk in the economy. Secondly, if small banks are specialized in extending loans to small firms, the shrinking market shares of small banks implies a cutback in the lending to these borrowers, especially to the more creditworthy ones among them. Thirdly, this could also create incentives for bank mergers, between small banks as well as between small and large banks. This will have the effect of reducing competition in the banking sector further.

In addition, possible problems can also arise in cross-border supervisory cooperation in cases where the host countries of foreign banking entities are unwilling to accept their use of the IRB approach sanctioned in their home countries, owing to the consequent competitive disadvantage for domestic banks using the Standardised approach. These can become a source of long-standing problems for consolidated financial reporting and supervision.

Pro-cyclicality

We have already seen in an earlier section how the use of market sensitive measures of risk is inherently procyclical. By determining capital according to risk models that respond to market indicators, there is a danger that this inherent pro-cyclicality in markets will be magnified by the IRB approach. In this approach, procyclical variation in risk weights can result from variations

⁹⁴ See Hakenes and Schnabel, 2006.

of both PD and LGD. This is because, a deterioration of economic conditions leads not only the probability of default (PD) but also loss given default (LGD) to rise, given that recovery rates on defaulted loans decline for reasons such as falls in the value of collateral. As PD and LGD rise in response to a cyclical downturn, this can lead to a potential increase in the capital charge for borrowers.

A very important work by Borio, Furfine and Lowe (2000) has argued that an important source of the amplification of financial cycles is the inappropriate responses by financial market participants to changes in the time dimension of risk, especially in its systematic component. These responses primarily reflect the mismeasurement of changes in the absolute level of risk over time. The latter arises partly from the short horizons that underlie most risk measurement methodologies and partly from insufficient attention being paid to the correlations across borrowers and institutions.

Most internal rating systems have a “point-in-time” focus and thus are designed around the idea of measuring the probability of default over the next year. This nature of the internal rating systems means that the average rating of a bank’s loan portfolio is likely to change over the course of the business cycle. When economic conditions are strong, loans are likely to move up the rating scale (to lower-risk ratings) given that the probability of default in the next year is relatively low. Conversely, in an economic downturn the average rating is likely to decline, given the increased probability of default in the short run. As a result, measured risk as revealed by average internal ratings is likely to be negatively correlated with the economic cycle - that is, it falls in booms and increases in recessions.⁹⁵

The correlation issue is not relevant for simple rating schemes, although it is critical in assessments of overall portfolio risk. Given that the focus of internal and external ratings is on measuring the risk of individual instruments or borrowers, such systems do not explicitly consider the correlations *between* ratings and how these correlations change over time. Thus, such ratings by themselves cannot easily be used to address the credit risk of large and complicated portfolios. Combined, these two shortcomings mean that changes in risk associated with the economic cycle tend to be assessed wrongly. In particular, risk is often underestimated in booms and overestimated in recessions.⁹⁶ This implies that capital requirements based on

⁹⁵ But the approach used by most credit rating agencies attempts to rate borrowers “through the cycle”. This means that ratings are less likely to move over the course of the business cycle, with borrowers being rated on their probability of defaulting in a constant hypothetical downside scenario. Ratings will only change over time if the rating agency changes its assessment of the probability of default in the downside scenario, or changes the scenario itself. Even so, external ratings, while arguably less sensitive to the cycle, are not immune from procyclical movements, with many more downgrades occurring in recessions than in booms. In addition, when downgrades happen, they may well occur in larger steps and only after the materialisation of risk. This might lead to larger discrete jumps in capital requirements than would be the case with internal ratings. Historically, the agencies have been relatively successful at measuring the cross-sectional dimension of risk. However, they have been less successful in downgrading ratings prior to a borrower defaulting. See Borio, Furfine and Craig, 2000.

⁹⁶ Empirical evidence is generally consistent with the view that measures of risk behave as if risk declined during the upswing phase and rose only close to the peak or as the downswing set in. The behaviour of credit and asset prices, of credit spreads on bonds traded in financial markets, credit ratings and bank provisions are all strongly procyclical, being highly negatively correlated with the business cycle. See Borio, Furfine and Lowe, 2000.

these internal ratings are bound to amplify the business cycles, by feeding a boom with higher lending and vice versa.

The current proposals envisage risk being assessed either by external credit ratings or by internal ratings. Of these two approaches, the internal ratings approach could be more exposed to the possibility of procyclical risk assessments, as capital requirements come to depend more closely on banks' own assessment of risk. There are at least two reasons for this. First, as discussed banks' internal measures of risk almost universally have a "point-in-time" focus and a one-year horizon, meaning that changes in current economic conditions are likely to generate a change in the measured riskiness of loans. Second, under the internal ratings approach, the capital charge will depend not only on the probability of default, but also on the loss given default, with the loss depending in part on the collateral that underpins the loan. The drive for riskweights to more accurately reflect probability of default (PD) is inherently pro-cyclical in that, during an upturn, average PD will fall – and thus incentives to lend will increase.⁹⁷ Conversely, during a downturn, average PD will increase (due to more difficult economic circumstances) and, in consequence, a credit crunch may develop with all but the most highly rated borrowers having difficulty attracting funds. In addition, deteriorating economic conditions would cause existing loans to "migrate" to higher risk categories, therefore raising overall capital requirements and deepening the downturn further. Powel (2004) has indeed shown that as Latin America adopts Basel II, it might cause credit to become more procyclical as loan supply becomes more sensitive to risk factors that vary with the business cycle.

Rojas-Suarez (2002) also argue that Basel II will raise the volatility of private capital flows to speculative-grade developing countries, and hence their vulnerability to currency crises. These concerns are based on four aspects of the New Accord.⁹⁸ First, the rigidity of the 8% minimum capital ratio and the linking of bank lending to bank equity acts as an automatic amplifier for macroeconomic fluctuations: banks lend more when times are good, and less when times are bad. Rigid capital requirements reinforce that habit. Second, the cyclical nature of the probability of default and of yield spreads, which determine regulatory capital needs and debt costs under the IRB approach; during the 1970-1999 period, one-year default rates for speculative-grade borrowers oscillated between 1% in tranquil times and 10% in crisis years, largely as a result of global, not idiosyncratic, shocks. Such fluctuations in default probability would translate into corresponding pro-cyclical shifts in risk weights, from 100 to 500% for speculative-grade borrowers. Finally, given the ongoing incentives for short-term rather than long-term inter-bank lending embedded in the Basel Accord, the regulatory incentives continue to tilt the structure of capital imports for speculative-grade developing countries towards short-term debt and make them vulnerable to capital-flow reversals.

⁹⁷ See Griffith-Jones and Persaud, 2004, Griffith-Jones, Segoviano and Spratt (2002), Claudio Borio, Craig Furfine and Philip Lowe (2000), Powel (2004), etc

⁹⁸ See Rojas-Suarez, 2002, *opcit.*

Thus, while Basel II purportedly intends to improve financial stability by depending on banks' internal rating systems that are better aligned to actual risks, this would only prove to have the contrary systemic impact, because of the increased propensity towards pro-cyclicality. Therefore, capital requirements designed to protect the stability of the financial system might differ from those designed to protect individual institutions. As Borio, Furfine and Lowe (2000) rightly point out, only longer horizons and a greater appreciation of correlations would contribute to better risk measurement, both at the level of individual institutions and for the system as a whole.

During the course of consultation, the Basel Committee has maintained that various features of the risk weights of the IRB approach under Pillar 1 can be expected to mitigate its pro-cyclical impact. For example, the length of the observation period mandated for estimating PD is at least five years and that for LGD and EAD seven years, with the qualification that if the observations for any of the sources used span a longer period, then the latter should be used. The greater allowance for eligible provisions can also be expected to reduce the importance in risk-weighted assets of defaulted loans during cyclical downturns when such loans increase as a proportion of banks' portfolios. The Committee further recommends that national supervisors could also promote the use of internal models leading to lower procyclicality, such as those used by external credit rating agencies. However, as we already saw, these ratings themselves are subject to pro-cyclicality.

As Borio, Furfine and Craig (2000) have argued, the worst excesses of financial cycles can only be mitigated by increased recognition of the build up of risk in economic booms and the recognition that the materialisation of bad loans in recessions need not imply an increase in risk. Capital and provisions should both rise during periods in which imbalances are developing in the financial system. Under such "dynamic provisioning", a protective cushion of loss reserves is built up in good times so that it is available to be drawn down in bad times, thus mitigating pro-cyclical pressures on bank lending. Recently, there has been much interest in rules embodying dynamic provisioning adopted in Spain in July 2000 and the Basel Committee expects that as this experience is more widely studied, such measures which are either consistent with Basel II or may contribute to its effectiveness could be adopted at national level by other countries. In this context, it is worth highlighting the proposal to make loan loss reserves tax-deductible. Encouraging higher provisions, tax-deductibility is a built-in stabiliser and economically not less sound than weighted capital requirements.⁹⁹

Conclusion

It is clear that the right regulatory and supervisory regime for banks is fundamental to ensuring economic growth and stability, given that banks continue to be the financing lifeline for most businesses and entrepreneurs in spite of the rapid promotion and expansion of stock markets

⁹⁹ See Raffer (2006).

worldwide. Since capital is the last line of defence against bank insolvency, regulatory capital requirements are one of the fundamental elements of banking supervision. Banks have an incentive to minimise the capital they hold, because reducing capital frees up economic resources that can be directed to profitable investments. On the other hand, the less capital a bank holds, the greater is the likelihood that it will not be able to meet its own debt obligations, i.e. that losses in a given year will not be covered by profit plus available capital, and that the bank will become insolvent. Thus, banks and their supervisors must carefully balance the risks and rewards of holding capital.¹⁰⁰ However, after the detailed and complex exercise undertaken by the Basel Committee in the last several years to strengthen the international banking system, it appears that the emphasis on bank stability without adequate consideration of developing country financing needs has tilted regulatory capital requirements against developing country interests, both from the point of view of financing for development as well as systemic stability of the international financial system.

Even though the history of the Basel Accord goes back by several decades, ever since the 1997-98 Asian crisis there has been widespread acknowledgement of the heightened vulnerability in the international financial system as a result of financial sector deregulation and liberalization. In subsequent efforts aimed at improving financial system stability, standards and codes have been put forward as core elements and therefore, as playing an overarching role in crisis prevention. However, standards and codes designed to discipline debtor countries distract attention from the capital supply side which has contributed to the 1997-98 crises and contagion, notably bank credit reversals; and thus slow down actual progress towards a crisis-resistant global financial architecture. For example, ignorance of investors' herding behaviour in standards design, notably for market sensitive risk management and transparency, risks raising rather than reducing the crisis proneness of the global financial system.

Further, stronger prudential standards, enhanced risk management and improved transparency, although necessary, are not sufficient to provide an assurance of financial stability in globalised financial markets. All regulators are confronted with the challenge that enhanced risk transfer capability in conjunction with financial engineering techniques can generate financial instruments with novel risk characteristics which do not easily fit into conventional instrument classes. Known ways of evading capital adequacy only serves to further the pyramiding of risks within the financial system.¹⁰¹ Even so, the enormous supervisory capabilities in terms of physical and human resources that is called for under Basel II's supervisory review, implies that premature adoption of the Revised Accord in countries with limited capacity could inappropriately divert resources from more urgent day-to-day supervisory priorities, ultimately weakening rather than strengthening supervision. It is also likely that the authorities' actions would push financing into unregulated sectors. If this were to occur on a large enough scale, the stability of the system as a whole might even be reduced by the regulators' actions, even if the stability of the regulated entities was improved.

¹⁰⁰ BCBS, 2005.

¹⁰¹ See BCBS (2003), Credit Risk Transfer.

It is clear that if the proposed implementation of Basel II is not to lead to severe adverse impact on lending patterns and financial stability, serious attention should be given to counter-cyclical mechanisms that might mitigate the procyclical elements of the IRB approach. Public policy should, and could, respond to cycles in financial system risk that threaten financial stability or significantly amplify the business cycle.¹⁰² Such policy options include, with the appropriate response depending very much on the particular circumstances: the promotion of improved measurement of risk; discretionary countercyclical adjustments in supervisory requirements;¹⁰³ the establishment of supervisory rules that make the system more robust to erroneous risk assessments; and the use of monetary policy to contain the development of financial imbalances. When prudential regulations fail to achieve the intended objective, the single most important instrument to achieve financial stability to prevent the build of financial stress or to achieve financial stability in the eventual occurrence of a crisis remains the use of capital controls.¹⁰⁴

While the pressures on developing countries for Basel II implementation will come from different directions as we discussed earlier, the underlying thrust, as in all recent efforts towards global harmonisation and homogenisation of economic structures, will be the projection of Basel II as a global “best practice”, whose adoption would enable countries to achieve financial stability in the globalised world. But, while Basel II is yet another attempt by the global financial community to remedy the woes associated with unhindered financial liberalization, it appears that apart from an increase in the cost of financing development implied by Basel II (for a variety of reasons discussed above), ironically enough, new forms of regulatory biases in bank lending and resultant systemic instabilities may be generated by its proposed implementation. This will exacerbate the existing conflicts between the objectives of financial stability and economic growth facing developing countries, with further adverse implications for their development prospects.

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102 See UN (2005) for a discussion on counter-cyclical financing instruments to deal with the cyclicity of international private capital flows to developing countries.

103 See Borio, Furfine and Lowe (2000) for some examples.

104 See Epstein, Grabel and Jomo (2004) and Raffer (2006) for detailed discussions and case studies of dynamic capital management techniques that have been effectively used as countercyclical instruments as well as for crisis management.

Annex Table 1: Alternative Approaches under Basel II

The Approaches	Basic Credit Risk Measurement Technique	Credit Risk Mitigation	Securitization Risks	Operational Risk
Simplified Standardized Approach (SSA)	Export Credit Agencies (www.oecd.org , Trade Directorate, ECA page)	Simple: risk weight of collateral substitutes that of claim.	SSA banks can only invest (cannot offer enhancements or liquidity facilities). Riskweight=100%	Basic Indicator. Capital=15% of Gross Income
Standardized Approach	Export Credit Agencies or Credit Rating Agencies (eg: S&P, Moody's, Fitch)	Simple: (as above). Comprehensive: exposure amount reduced subject to claim and collateral haircuts.	Standardized: uses export credit agency ratings (only investing banks can use below BB+)	Basic Indicator. Or Standardized Approach where Bank Capital=weighted sum of gross income across activities
IRB Foundation	Banks' internal ratings for default probability and Basel II formula sets capital requirement (Loss Given Default 45% for Senior debt and 75% for Subordinate debt).	Comprehensive, then LGD adjusted given reduction in exposure and capital requirement given by Basel formula	IRB Approach: Investing banks may use bank Ratings according to a standard scale. Originators may use Supervisory Formula	More sophisticated banks will be expected to graduate to the Advanced Measurement Approach where capital requirement given by own risk measurement system
IRB Advanced	Banks set internal rating (default probability), LGD, Exposure at Default and Maturity. Capital requirement still given by Basel formula	Own model determines LGD and EAD and capital requirement given by formula	As IRB Foundation	As IRB Foundation

Source: Powell (2004)

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