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Policy Analysis Unit (PAU)

Policy Note Series: PN 0604

Basel II and Bangladesh: The Challenges Ahead

Md. Kabir Ahmed

December 2005

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Basel II and Bangladesh: The Challenges Ahead

Md. Kabir Ahmed¹

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Abstract

Basel II consists of three pillars such as Pillar I, II and III. Implementation of this New Accord is a challenge for many developing countries including Bangladesh. This study has made an attempt to find the challenges that are likely to be faced and the approaches that are more appropriate for Bangladesh so as to measure and charge capital against credit risk and operational risks under Pillar I. The findings show that lack of domestic rating agencies, in terms of number and depth, may pose a challenge for implementation of the standardized approach for credit risk. However, Bangladesh may follow either the Simplified Standardized Approach (SSA) or the Foundation (Internal Rating-based) IRB Approach. The recent changes in the banking sector in terms of risk management practices signal that the banking system is gradually becoming conducive for the adoption the IRB Foundation Approach. It requires updating of Credit Risk Grading Manual to be consistent with the New Accord and also requires some other preparations such as redesigning the information system of the Credit Information Bureau (CIB) and equipping Bangladesh Bank's respective staff/members with need-based advanced training. In order to charge capital for operational risk, Basic Indicator Approach (BIA) may be more appropriate than either the Standardized Approach (SA) or the Advanced Measurement Approach (AMA). Since charging 15 percent of gross income as capital requirement for operational risk may undermine banks' capital position, phase-wise implementation may be a better alternative for a smooth transition to Basel II.

Keywords: Basel II, Credit Risk, Operational Risk, Simplified Standardized Approach (SSA), Internal Rating-based (IRB) Approach, Basic Indicator Approach (BIA), Standardized Approach (SA), Advanced Measurement Approach (AMA).

JEL Classification: G21, G32, G34.

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Basel II and Bangladesh: The Challenges Ahead **-Md. Kabir Ahmed**

1 Introduction

Capital adequacy is defined as the minimum level of capital, which is required to protect a bank from portfolio losses. However, debate on the quantum of minimum level of capital seems to be never ending. Though different methods and approaches were adopted in different points in time, they were insufficient to capture new dimensions and magnitudes of risk emanated from the continuous innovations in the domestic and international business. Consequently the 1970s and 80s experienced many uncertainties and volatilities that caused serious banking problems. The approach that a bank's capital should be linked to a *fixed* ratio of its time and demand liabilities went under strong criticism on the ground that bank's major risk is derived from the riskiness of its assets. The Basel Committee, based on this idea, designed Capital Regulation in 1988, which is known as the Basel Accord I.

Two fundamental objectives of the Accord were (a) to strengthen the soundness and stability of the international banking system and (b) to obtain a high degree of consistency in its application to banks in different countries with a view to diminishing an existing source of competitive inequality among international banks. To that end, the accord requires that banks meet a minimum capital ratio that must be equal to at least 8 percent of total risk-weighted assets. However, the Accord has been widely criticized for its failure to achieve the stated objectives. Since it introduced risk-based capital requirement, which was adopted by many developed and developing countries as well, it was expected that the Accord would help to strengthen financial system stability and reduce banking and financial crises. On the contrary, banking crises again occurred in 1990s even in some robust economies of East Asia. The Accord was also criticized for the inherent weaknesses in the model as detailed below.

Rodriguez (2002) and others argue that the use of arbitrary risk categories and arbitrary weights that bear no relation to default rates incorrectly assume that all assets within one category are equally risky. For example, a loan to a well-established company such as Beximco Pharma or Square Pharmaceuticals is considered as risky as a loan to a new company established by a new entrepreneur. Loans made to companies in the non-trading sector of the economy are considered as risky as loans made to companies in the trading sector, even though the latter are usually less risky than the former. The risk assessment methodology is flawed in the sense that it assumes a portfolio's total risk is equal to the sum of the risks of the individual assets in the portfolio. No account is taken of portfolio management strategies, which can greatly reduce the overall risk of a portfolio, or of the size of a portfolio, which can greatly influence its total risk profile.

The accord gives preferential treatment to government securities, which are considered risk-free. The sovereign debt defaults of Russia in the summer of 1998 and Argentina in early 2002 demonstrated that government debt is not a risk free investment. Other criticisms include that the accord sets capital standards only for credit risk (i.e., the risk of counterparty failure), but not for other types of risk such as operational risk and market risk. Consequently, capital requirement was not reflective of economic risk. It has not provided enough incentive for risk management, risk mitigation and innovation in risk management such as arbitrage opportunities through securitization.

When the Accord was formalized, no consensus and consultation were taken from the representatives of the developing nations. Therefore, it is sometimes criticized as OECD Club-rule. McDonough (2000) argues that as banks have developed innovative techniques for managing and mitigating risk, credit risk now exists in more complicated, less conventional forms than is recognized by the 1988 Accord, thus rendering capital ratios, as presently calculated, less useful to banking supervisors. The financial world has changed dramatically over the past dozen years, to the point that the Accord efficacy has eroded considerably (McDonough, 2000).

The Basel Committee tried to address some of these criticisms over the years, modifying the Accord through out the years from 1990s to 2004 and Basel Accord II (included representatives from G10 and

non-G10 countries) is the result of such efforts. The primary objective of the New Accord is to make it more risk-sensitive so that financial institutions will be able to sustain even in periods of financial crisis. Consequently, the new proposal moves ahead of the “one-size-fit-all” approach. Another objective of the Accord is to continue to enhance competitive equality among the internationally active banks throughout the world.

The Accord has provided many areas of national discretions, which require an extensive study to guide policy actions in appropriate directions. This study has made an attempt to analyse the prevailing status and conditions of the banking sector in line with Basel II requirements. In order to deepen and widen understanding in a specific area, this study has mainly concentrated on the implementation aspects of Pillar I, which has three components such as *credit risk*, *operational risk* and *market risk*. In fact, this study has further narrowed down its scope to focus on different approaches for the measurement of capital charge against credit risk and operational risk and seeks to answer the following questions: (a) What kinds of challenges are likely to be faced by both the Bangladesh Bank and the scheduled banks in adopting different approaches to credit risk and operational risk? (b) Which approaches are likely to be more appropriate for Bangladesh to measure and charge capital against those risks?

The rest of the paper is structured as follows. Section 2 outlines the conceptual framework of Basel Accord II. Section 3 highlights different approaches of credit risk measurement, discusses current status of the banking sector in the context of those approaches and examines their appropriateness under prevailing market conditions. Section 4 presents a comparative discussion of different approaches of operational risk measurement in terms of their sophistication, complexity and standards that will be required by banks to qualify for their adoption. It also highlights the global trends in adopting different approaches. Section 5 concludes by indicating the approaches that may be adopted in the banking sector of Bangladesh.

2 Conceptual Framework of the New Accord

The New Accord has defined a structured framework comprising three pillars such as Pillar I, II and III. Pillar I sets out minimum capital requirements. Pillar II defines the process of supervisory review of a financial institution’s risk management framework. Pillar III determines market discipline through improved disclosure.

Pillar I- Minimum Capital Requirement

In Pillar I, three kinds of risk such as credit risk, market risk and operational risk are considered to determine the minimum capital requirement. The definition of eligible regulatory capital remains the same as outlined in the 1988 Accord i.e., *the ratio of capital to risk-weighted asset remains unchanged at 8%*.

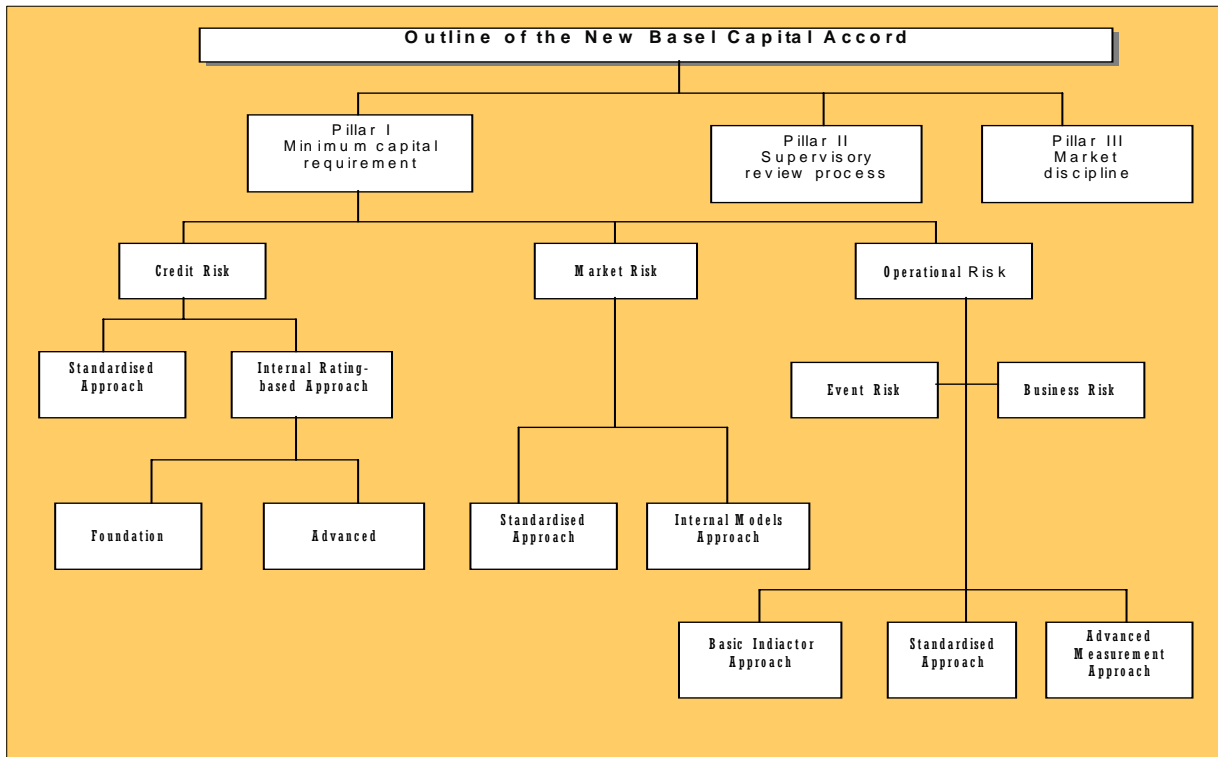
Pillar II-Supervisory Review

Pillar II ensures that not only do banks have adequate capital to cover their risks, but also that they employ better risk management practices so as to minimize the risks. Supervisors will be expected to evaluate the board and management of banks, to look into strategic decisions and to evaluate portfolio diversification as well as the ability to react to future risks in a rapidly changing environment. In particular, issues of transparency, corporate governance and efficient markets can be considered as additional challenges in pillar II enforcement.

Pillar III- Market Discipline

Banking operations are becoming complex and difficult for supervisors to monitor and control. In this context, Basel Committee has recognized the importance of market discipline and has suggested to implement it by asking banks to make adequate disclosures. The potential audiences of these disclosures are supervisors, bank's customers, rating agencies, depositors and investors. With frequent and material disclosures, outsiders can learn about the bank's risks.

Chart 2.1: Outline of the New Basel Accord



3 Credit Risk

Credit Risk is defined as the possibility that the borrower will fail to repay the loan obligation as per agreed terms. The new Accord has provided a choice between two broad methodologies to calculate minimum capital requirement for credit risk: (a) standardised approach and (b) internal rating-based approach.

3.1 Standardized Approach (SA)

Under standardized approach, credit assessment will be conducted by external credit assessment institutions (ECAI) as eligible for capital purposes by the *national supervisors*. Risk-weight against each rating will be applied to individual credit exposure to arrive at risk-weighted asset. Before allowing ECAs such as the rating agencies, *national supervisor* will have to ensure that they fulfill the following standards set by Basel Committee (2004):

- (i) **Objectivity:** The methodology for assigning credit assessments must be rigorous, systematic and subject to some form of *validation based on historical experience*. Before being recognized by *supervisors*, an assessment methodology for each market segment, including *rigorous back testing*, must have been established for at least **one year and preferably three years**.
- (ii) **Independence:** An ECAI should be independent and should not be subject to political or economic pressures that may influence the rating. The assessment process should be as free as possible from any constraints that could arise in situations where the composition of the board of directors or the shareholder structure of the assessment institution may be seen as *creating a conflict of interest*.
- (iii) **International access/Transparency:** The individual assessments should be available to both domestic and foreign institutions with legitimate interests and at equal terms. In addition, *the general methodology used by the ECAI should be publicly available*.
- (iv) **Disclosure:** An ECAI should disclose the information on its assessment methodologies, including the definition of default, the time horizon and the meaning of each rating, the actual default rates experienced in each assessment category, and the transitions of the assessments i.e., the likelihood of AA ratings becoming A over time.
- (v) **Resources :** An ECAI should have sufficient resources to carry out high quality credit assessments.

These resources should allow for substantial ongoing contact with senior and operational levels within the entities assessed in order to add value to the credit assessments.

In addition, *supervisors* will be responsible for assigning eligible ECAIs' assessments to the risk weights available under the standardized risk weighting framework, i.e., deciding which assessment categories correspond to which risk weights.

Fitness of the Standardized Approach under existing market conditions

It is argued that in many countries, low rating penetration and a lack of domestic rating agencies may pose a challenge for implementation of the standardized approach, particularly in respect of corporate claims. This is not untrue for Bangladesh where the rating industry is not advanced enough and the majority of the individual claims of bank loans remain unrated. Currently two rating agencies, namely CRISL and CRAB, are operative in the financial market. If the standardized approach is adopted, it is highly likely that regulation may force the banks to rush to them. Since banks in Bangladesh are linked with tens of thousands of borrowers, the capability of these two rating agencies in terms of credit assessment of those borrowers within the regulatory timeframe may not be sufficient. Adopting SA without having sufficient number and depth of rating agencies may also cause other problems. For example, cost of credit assessment may be substantially increased due to high regulatory demand for this service. This, in turn, may increase lending price and may affect banks' profitability.

The Accord requires that the assessment process should be as free as possible from any constraints that could arise in situations where the composition of the board of directors or the shareholder structure of the assessment institution may be seen as *creating a conflict of interest*. However, the existing Credit Companies Rules that was enacted in 1996 to regulate the business of credit rating agencies has not considered this issue in line with Basel's new standard. It is understood that directors of the existing rating agencies are directors of the scheduled banks as well as directors of other public and private companies. This type of conflict of interest may cause for rating-biases and need to be addressed urgently through legal changes before adopting the standardized approach. High default culture in the financial market of Bangladesh indicates that existing weak regulatory framework for rating agencies may influence borrowers' behavior to obtain good rating inappropriately. Therefore rating regulations need to be updated to address such potential problems. A conference (Effects of Implementing Basel II in Emerging Markets) was held in Panama on 13 April 2004 where it was concluded that the "Full" Standardized Approach cannot function properly without an adequate regulatory framework for credit rating agencies. On the other hand, it expressed concern on the role of credit rating agencies for two major reasons: (i) the track record of these agencies in their region in assessing risks was not satisfactory and (ii) the use of credit rating for the purpose of determining required capital might result in biased ratings of borrowers.

It can be noted that credit risk modeling, back-testing and forecasting require high level knowledge of probability statistics, financial econometrics and times series analysis. It is yet to be ascertained whether the existing rating agencies have sufficient qualified human resources who can perform those activities in a professionally competent manner. Since rating greatly depends on long historical data, given that the industry is of recent origin², it can be assumed that they may not have sufficient database to validate their models.

3.2 Internal Rating-based (IRB) Approach

The proponents of the IRB approach argue that increasing reliance on rating agencies in the regulatory process under standardized approach would undermine the initiatives of banks in enhancing their risk management policies, practices and internal control systems. However, adoption of IRB approach will bring new challenges for supervisor as well as banks in developing economies like Bangladesh. The details are discussed below:

In the IRB approach, the four risk parameters that need to be estimated are PD (i.e., probability of default of borrower in each risk grade over a one year time horizon), LGD (i.e., loss in the event of a default),

² The CRISL started its business in 2002 and the CRAB began to work since late 2004.

EAD (i.e., exposure amount at the time of default) and Maturity (i.e., remaining effective maturity of the exposure at default). The Accord has provided two types of IRB approach: (a) Foundation IRB Approach and (b) Advanced IRB Approach.

Under the **Foundation IRB approach** banks provide their own estimates of PD and rely on supervisory estimates for other risk components such as LGD, EAD and M. Under the advanced approach, banks provide more of their own estimates of PD, LGD and EAD, and their own calculation of M, subject to meeting the minimum standards. For both the foundation and advanced approaches, banks must always use the risk-weight functions provided in the New Accord for the purpose of deriving capital requirements.

Estimation of the parameters

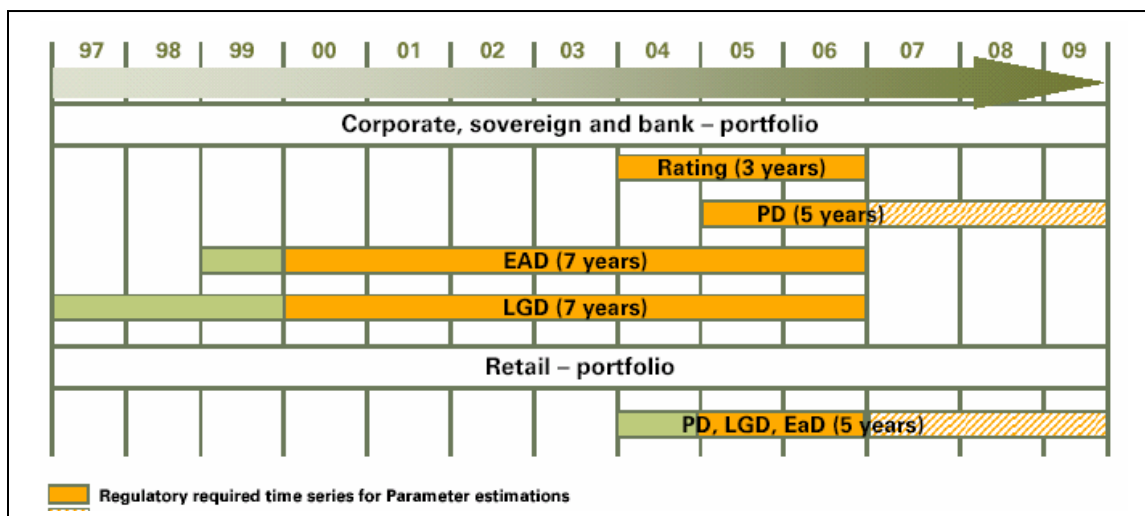
The critical issues that both supervisor and the banks will face in implementing IRB approach are:

- Historical data to estimate PD
- Historical loss database to estimate LGD
- Historical exposure data to estimate EAD

Various types and characteristics of data are necessary to estimate each of these parameters. Some of them are discussed below from Artigas's (2004) famous article 'A Review of Credit Registers and their Use for Basel II'.

Historical data to estimate PD: In order to calculate each bank's minimum capital requirements under Basel II, banks need to have ready access to an essential information set. As regards, PD estimation, the development of an overall borrower rating system requires default information. In addition, the development of an appropriate rating system would require information on certain loan characteristics that could be used, either directly or through transformation (data refinement), to construct variables that are sufficient for determining each borrower's credit quality or, in other words, its probability of default. Among other items, desirable information would be on guarantees, duration of borrower's existence in the system, default history of each borrower (number of times that they have defaulted previously, or proportion of defaults in terms of how long they have been in the system), history of an obligor's rating migrations (upgrades or downgrades), number and type of banks with which obligors deal, past due debt without reaching default status (delinquency status), industry to which obligors belong, type of credit instrument and maturity date. Others financial variables such as leverage ratios, debt burden, efficiency, productivity and profitability in the case of firms, and employment status and indebtedness profile in the case of individuals, along with the stage of the business cycle of the economy, could form the core group of variables needed to estimate a rating system. As per Basel standard, estimation of PD needs to be based on 5 years' historical data.

Chart 3.1: Required time series of risk parameters to be in compliance with the IRB approaches



Source: KPMG International (2004)

Historical loss database to estimate LGD

In the case of LGD, certain readily identified characteristics would be needed to estimate its determinants empirically via a regression model. Calculating LGD properly requires knowledge of type of collateral, percentage of collateral coverage, credit operation's interest rate, age of operation (time elapsed since loan origination), industry; loan size, loan maturity date, the amount finally recovered, the time taken to recover it, all the costs incurred in the process (from legal costs to the opportunity cost of money), all possible intermediate recoveries and the discount rate to be applied. Since the Accord leaves open the option of making use of external data, LGD can be estimated using market data such as market prices of defaulted loans or bonds. The above information along with other qualitative variables furnished by the departments entrusted with recovery management could also be used for LGD validation. It can be noted that *for validation of the LGD the required information structure basically depends on characteristics of the credit operations themselves whereas for PD validation the required data mostly refer to intrinsic characteristics of borrowers.*

Historical exposure data to estimate EAD

Regarding EAD validation, information on drawn and un-drawn exposures, particularly in the period of time prior to a default event, is necessary. An analysis of how borrowers make use of their commitments (particularly the unknown part) over time would be a good first approximation for validating EAD. Other items such as the number of banks with which a borrower deals, past default history, size of the loan, industry and guarantees appear to be items, which, in principle, may seem to explain EAD. Moreover, an assessment based on qualitative elements could also be a reasonable validation solution.

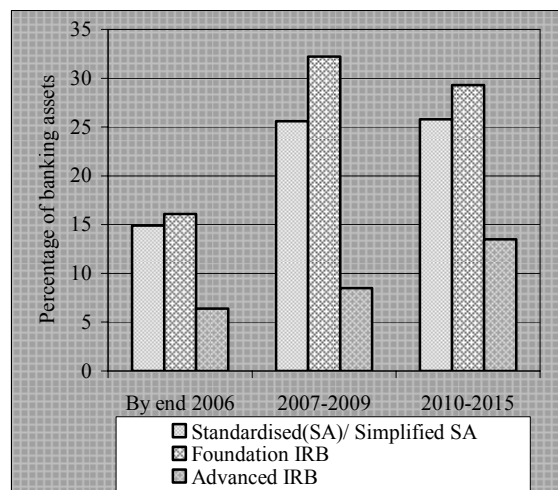
It is argued that data quality is an important factor that could affect the quality of risk measures generated by the model. Incomplete, imprecise and archaic data may rather increase the risk and the losses faced by banks.

Fitness of the IRB Approach under existing market conditions

To make a choice between the two IRB Approaches, their appropriateness in the existing market conditions need to be assessed. Both of these approaches, in fact, require risk modeling by the banks themselves. Since risk modeling is a new concept for the banking sector of Bangladesh, it can therefore be assumed that banks do not have adequate trained human resources in this regard. Between these two approaches, Advanced Approach is more sophisticated than the Foundation Approach. Adoption of the Advanced Approach requires the banks to have some years of practical experience in exercising risk modeling and forecasting. Accuracy of these models in calculating risk needs to be examined and validated. In this matter, another important point needs to be considered. Advanced Approach will allow the banks to determine LGD and EAD independently. Since these two variables are inputs in the calculation of minimum capital requirement for credit risk, manipulation of these two variables by the banks may significantly change their capital requirement. Considering the above factors, it can be argued that the Foundation Approach seems to be more appropriate than the Advanced Approach in the banking sector of Bangladesh.

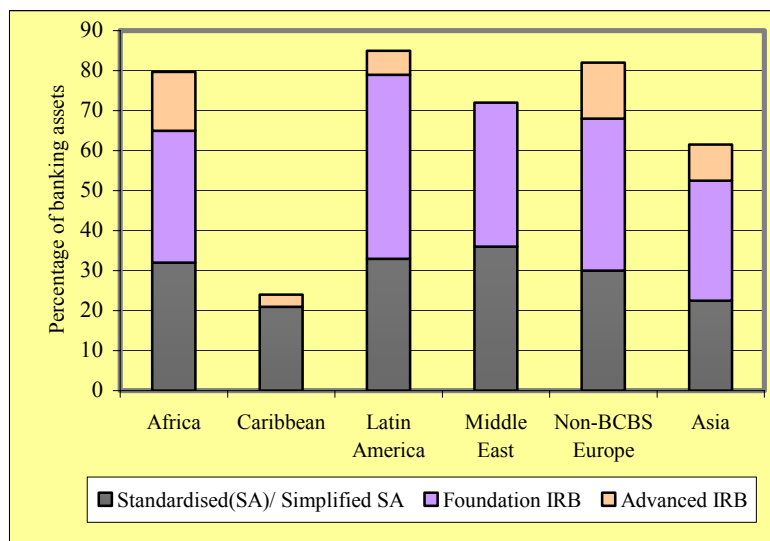
Since other countries, like Bangladesh, will face some common challenges, it would be better to look into the examples of other nations. A survey conducted by Financial Stability Institute (FSI, 2004) has indicated that globally more than 100 countries are going to implement new Basel Accord. However, in measuring credit risk and calculating minimum capital requirement against it, the highest percentage of banking asset will be subject to IRB Foundation Approach followed by Standardised/ Simplified Standardised Approach (see Chart 3.2).

Chart 3.2 : Percentage of banking assets expected to be subject to credit risk approaches in Basel II (weighted average)



The above trend has also been observed across different regions. The survey has revealed that except the Caribbean, the highest percentage of banking assets in different regions will be subject to IRB Foundation Approach followed by Standardised/ Simplified Standardised Approach (see Chart 3.3).

Chart 3.3: Percentage of banking assets expected to be subject to credit risk approaches in Basel II during 2007-09, by region (weighted average)



It can be mentioned that if some economies have greater banking asset and they follow a common approach, the entire survey result may be biased in favor of that approach and may not properly indicate what approaches are likely to be adopted by major nations. Therefore, Asia's result has been again disaggregated by excluding the jurisdiction with the highest banking assets. The result indicates that though IRB Foundation Approach is likely to be subject to the highest percentage of banking asset (see chart 3.4), standardized/simplified standardized approach is more likely to be adopted by the major nations in Asia (see chart 3.5).

Chart 3.4 :Banking assets expected to be subject to Basel II credit approaches (weighted average) in Asia

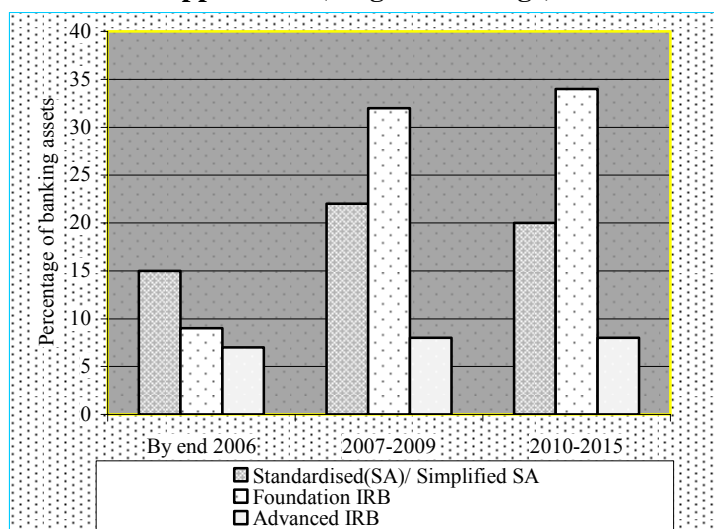
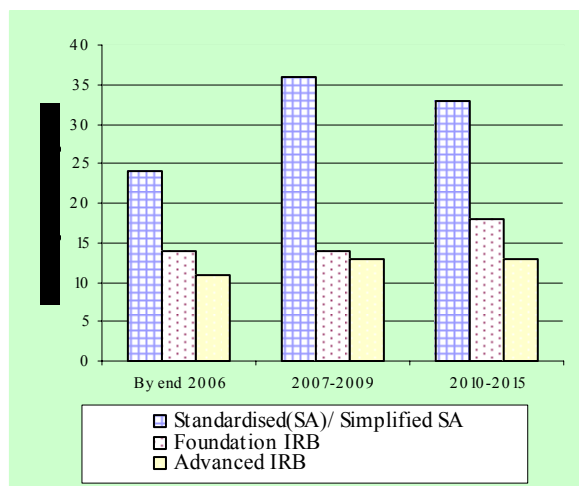


Chart 3.5 : Banking assets expected to be subject to Basel II credit risk approaches in Asia, excluding the jurisdiction with the greatest banking assets (weighted average)



If examples of other nations are considered, it can be argued that Advanced IRB is not a suitable option for Bangladesh, which leads a choice between Standardized/Simplified Standardized Approach and Foundation IRB Approach. As mentioned earlier (see section 3.1.1), Standardized Approach may not be a suitable option for Bangladesh due to the lack of adequacy of rating agencies, weak legal framework and possibility of cherry picking of rating biases. However, Bangladesh may follow either Simplified Standardized Approach (SSA) or Foundation IRB Approach.

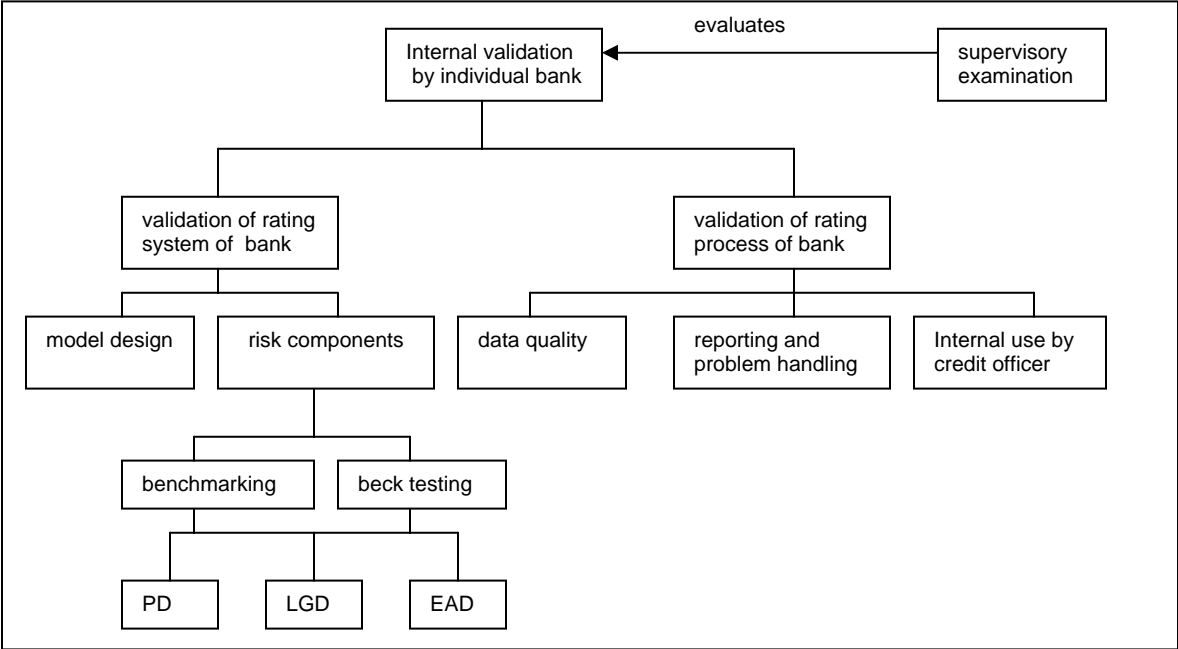
Again, between the SSA and IRB Foundation Approaches, which approach is likely to be more appropriate for Bangladesh? Answer to this question is not straightforward. SSA does not require any major preparation by banks and the supervisor. In this case, as like as Basel Accord I, banks will have to arrange their assets into different categories and multiply them by the corresponding risk-weight provided in the New Accord in order to find risk-weighted asset. However, recent changes in the banking sector in terms of risk management practices signal that banking system is gradually becoming conducive to the adoption of IRB Foundation Approach. For example, Bangladesh Bank vide BRPD(Banking Regulation and Policy Department) Circular No. 18, dated December 11, 2005 has introduced Credit Risk Grading

Manual for all the scheduled banks in Bangladesh. It will enable the banks to be familiar with risk modeling. Notwithstanding a lot of work needs to be done. For instance, the Manual provides some qualitative grading depending on some quantitative measurements. These qualitative criteria need to be translated into different risk categories. The modeling methodology needs to be updated to be consistent with the New Basel Accord. As per IRB Foundation Approach, borrower’s past default information such as default history of each borrower (number of times that they have defaulted previously, or proportion of defaults in terms of how long they have been in the system), history of an obligor’s rating migrations (upgrades or downgrades), past due debt without reaching default status (delinquency status) are prime inputs for risk grading which are not properly considered in the above Manual. Likewise international bank guarantee has been included in the category of superior risk grading such as 100 percent cash cover and government guarantee. In the Basel Accord II, minimum risk-weight for a AAA to AA⁻ rated bank is 20 percent. These kinds of inconsistencies need be revised. Besides, risk rating mapping process as per Basel norm needs to be developed.

As a supervisor, the Bangladesh Bank will require to provide supervisory formula to determine LGD and EAD depending on the types of credit and their sectoral exposures. In this case, the role of Credit Information Bureau (CIB) in storing and disseminating credit information needs to be redefined. For example, estimation of PD requires 5 (five) years' previous data and estimation of EAD and LGD require 7 years' past data. At present, Credit Information Bureau (CIB) of Bangladesh Bank stores information on borrowers of the banks and non-bank financial institutions. Once a borrower repays its past default debt, its status is updated a never-defaulted good borrower. The new Accord requires storing such default behavior of the borrower. In order to estimate risk components such as LGD, EAD and M, Bangladesh Bank, as a supervisor, will require getting information on sector-wise credit exposures and their default trend. It can further be mentioned that borrower’s credit information from CIB has been made compulsory only for big loans; adoption of Foundation IRB Approach requires credit information even for small borrowers. Consequently, adoption of IRB approach will require CIB to redesign its information system.

Since adopting the Foundation Approach requires the supervisor to examine and validate banks’ internal credit risk models (see Chart 3.6), adoption of this approach requires equipping Bangladesh Bank’s relevant staffs.

Chart 3.6: Components of a validation methodology



Source: BIS (2005)

4.0 Operational Risk

Operational risk is defined by the Basel Committee as “ the risk of loss resulting from inadequate or failed internal processes, people and system or from external events including legal risk but excluding strategic and reputational risk.” Legal risk includes, but is not limited to, exposure to fines, penalties, or punitive damages resulting from supervisory actions, as well as private settlements.

In order to charge capital requirement for operational risk, three approaches suggested by the New Accord are (i) Basic Indicator Approach (BIA) (ii) Standardized Approach (SA) and (iii) Advanced Measurement Approach (AMA). National supervisor will allow the banks to adopt a particular approach. It can be noted that the New Accord will require the banks to charge a significant percent (for BIA, 15 percent of gross income and for SA, minimum 12-18 percent of gross income of each business line) of their gross income as capital requirement. If banks are compelled to comply with this high requirement, would it not likely to undermine the capital adequacy of the banking industry as a whole. If so, what may be the mode of application for implementation of Operational Risk? This study seeks to find possible answers to these questions.

4.1 Conceptual Framework of the three approaches

(a) The Basic Indicator Approach

Banks using the BIA must hold capital for operational risk equal to the average over the previous three years of a fixed percentage (denoted alpha) of positive annual gross income. Figures for any year in which annual gross income is negative or zero should be excluded from both the numerator and denominator when calculating the average. The charge may be expressed as follows:

$$K_{BIA} = [(\alpha \sum_{i=1}^3 GI_i) / n]$$

Where, K_{BIA} = the capital charge under the Basic Indicator Approach

GI = annual gross income, where positive, over the previous three years

n = number of the previous three years for which gross income is positive

α = 15 percent, which is set by the Committee, relating the industry wide level of required capital to the industry wide level of the indicator.

Gross income is defined as net interest income plus net non-interest income. It is intended that this measure should: (i) be gross of any provisions (e.g. for unpaid interest); (ii) be gross of operating expenses, including fees paid to outsourcing service providers; (iii) exclude realised profits/losses from the sale of securities in the banking book; and (iv) exclude extraordinary or irregular items as well as income derived from insurance.

(b) The Standardised Approach

In the Standardised Approach, banks' activities are divided into eight business lines such as corporate finance, trading & sales, retail banking, commercial banking, payment & settlement, agency services, asset management, and retail brokerage. Within each business line, gross income is a broad indicator that serves as a proxy for the scale of business operations and thus the likely scale of operational risk exposure within each of these business lines. The capital charge for each business line is calculated by multiplying gross income by a factor (denoted beta) assigned to that business line. Beta serves as a proxy for the industry-wide relationship between the operational risk loss experience for a given business line and the aggregate level of gross income for that business line. The total capital charge is calculated as the three-year average of the simple summation of the regulatory capital charges across each of the business lines in each year. In any given year, negative capital charges (resulting from negative gross income) in any business line may offset positive capital charges in other business lines without limit. However, where the aggregate capital charge across all business lines within a given year is negative, then the input to the numerator for that year will be zero. The total capital charge may be expressed as:

$$K_{TSA} = \left\{ \sum_{i=1}^3 \text{Max} \left[\left(\sum_{j=1}^8 GI_j \beta_j \right), 0 \right] \right\} / n$$

Where, K_{TSA} = the capital charge under the Standardised Approach

GI_{1-8} = annual gross income in a given year, as defined above in the Basic Indicator Approach, for each of the eight business lines

β_{1-8} = a fixed percentage, set by the Committee, relating the level of required capital to the level of the gross income for each of the eight business lines. The values of the betas are detailed below.

n = number of the previous three years for which gross income is positive

Business Lines	Beta Factors
Corporate finance (β_1)	18 percent
Trading and sales(β_2)	18 percent
Retail banking(β_3)	12 percent
Commercial banking(β_4)	15 percent
Payment and settlement(β_5)	18 percent
Agency services(β_6)	15 percent
Asset management(β_7)	12 percent
Retail brokerage(β_8)	12 percent

(c) Advanced Measurement Approach (AMA)

Capital charge equals internally generated measure based on internal loss data, external loss data, scenario analysis and business environment and internal control factors. Mitigation of risk is recognised up to 20 percent of the total operational risk capital charge calculated under AMA.

4.2 Requirements for adoption of any of the three approaches

(a) Common requirements

The New Accord requires that banks using any of the three approaches will have to comply with the Basel Committee's guideline on *Sound Practices for the Management and Supervision of Operational Risk*, which was released in 2003. This guideline has identified 10 (ten) principles to be followed for sound practices of the management and supervision of operational risk in banking.

Principle 1: The board of directors should be aware of the major aspects of the bank's operational risks as a distinct risk category that should be managed, and it should approve and periodically review the bank's operational risk management framework. The framework should provide a firm-wide definition of operational risk and lay down the principles of how operational risk is to be identified, assessed, monitored, and controlled/mitigated.

Principle 2: The board of directors should ensure that the bank's operational risk management framework is subject to effective and comprehensive internal audit by operationally independent, appropriately trained and competent staff. The internal audit function should not be directly responsible for operational risk management.

Principle 3: Senior management should have responsibility for implementing the operational risk management framework approved by the board of directors. The framework should be consistently implemented throughout the whole banking organization, and all levels of staff should understand their responsibilities with respect to operational risk management. Senior management should also have responsibility for developing policies, processes and procedures for managing operational risk in all of the bank's material products, activities, processes and systems.

Principle 4: Banks should identify and assess the operational risk inherent in all material products, activities, processes and systems. Banks should also ensure that before new products, activities, processes and systems are introduced or undertaken, the operational risk inherent in them is subject to adequate assessment procedures.

Principle 5: Banks should implement a process to regularly monitor operational risk profiles and material exposures to losses. There should be regular reporting of pertinent information to senior management and the board of directors that supports the proactive management of operational risk.

Principle 6: Banks should have policies, processes and procedures to control and/or mitigate material operational risks. Banks should periodically review their risk limitation and control strategies and should adjust their operational risk profile accordingly using appropriate strategies, in light of their overall risk appetite and profile.

Principle 7: Banks should have in place contingency and business continuity plans to ensure their ability to operate on an ongoing basis and limit losses in the event of severe business disruption.

Principle 8: Banking supervisors should require that all banks, regardless of size, have an effective framework in place to identify, assess, monitor and control/mitigate material operational risks as part of an overall approach to risk management.

Principle 9: Supervisors should conduct, directly or indirectly, regular independent evaluation of a bank's policies, procedures and practices related to operational risks. Supervisors should ensure that there are appropriate mechanisms in place, which allow them to remain apprised of developments at banks.

Principle 10: Banks should make sufficient public disclosure to allow market participants to assess their approach to operational risk management.

(b) Specific requirements

Except the common criterion as discussed earlier, the New Accord has not fixed any other qualifying criteria for adoption of BIA. The other conditions attached to the adoption of SA is that a bank must satisfy its supervisor that (a) at a minimum (i) its board of directors and senior management, as appropriate, are actively involved in the oversight of the operational risk management framework; (ii) it has an operational risk management system that is conceptually sound and is implemented with integrity; and (iii) it has sufficient resources in the use of the approach in the major business lines as well as the control and audit areas. (b) *Supervisors will have the right to insist on a period of initial monitoring of a bank's Standardized Approach before it is used for regulatory capital purposes.* (c) A bank must develop specific policies and have documented criteria for mapping gross income for current business lines and activities into the standardized framework. The criteria must be reviewed and adjusted for new or changing business activities as appropriate.

In order to qualify for AMA, banks will require to meet some general, qualitative and quantitative standards. The general standards are that (i) a bank's board of directors and senior management, as appropriate, are actively involved in the oversight of the operational risk management framework; (ii) it has an operational risk management system that is conceptually sound and is implemented with integrity; and (iii) it has sufficient resources in the use of the approach in the major business lines as well as the control and audit areas. The qualitative standards are that (i) the bank must have an independent operational risk management function that is responsible for the design and implementation of the bank's operational risk management framework; (ii) the bank's internal operational risk measurement system must be closely integrated into the day-to-day risk management processes of the bank; (iii) there must be regular reporting of operational risk exposures and loss experience to business unit management, senior management, and to the board of directors; (iv) the bank's operational risk management system must be well documented; (v) internal and/or external auditors must perform regular reviews of the operational risk management processes and measurement systems; (vi) operational risk measurement system must be validated by the by external auditors and/or supervisor. The major quantitative standards are that a bank must (i) develop specific criteria for assigning loss data to particular business lines and risk types, (ii) collect historical internal loss data and exposure indicators in a form that is consistent with the business line/event type categories specified by supervisors, (iii) establish procedures for the use of external data as a supplement to its internal loss data, (iv) regularly conduct validation of any parameters (e.g., loss rates, risk indicators, or scale indicators) used in its internal loss measurement systems in order to ensure that the inputs to the regulatory capital charge are reliable, (v) internally generated operational risk measures used for regulatory capital purposes must be based on *a minimum historical observation period of five years*. However, during an initial transition period, a three years historical data window might be accepted for all business lines and event types.

4.3 Suitability of the above approaches

Inappropriate choice of an approach may cause for regulatory burden for the banking system and may hinder its development. It is therefore necessary to examine the suitability issue diligently. This can be done from two points of view: (1) current market condition perspective, and, (2) global and regional, particularly Asian banking perspective.

(c) Current market condition perspective

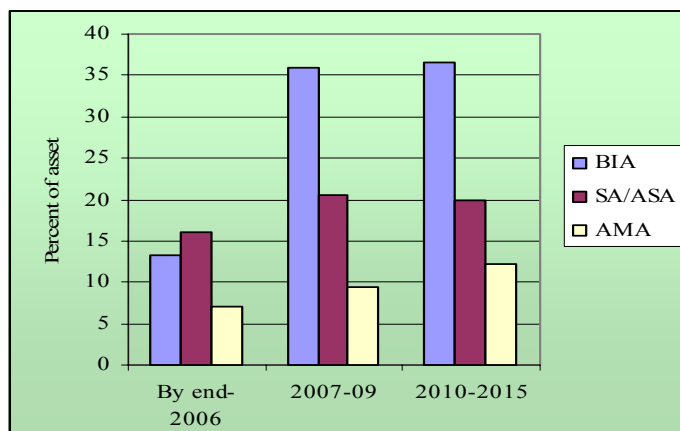
Sound practice of operational risk management is a precondition for all of the three approaches. Therefore current status of the banking sector in terms of Operational Risk Management practices may be reviewed. It can be mentioned that the Bangladesh Bank, recognizing the importance of a sound risk management system, issued a number of important guidelines on managing core risks in banking. In 2003, five separate guidelines on five core risks such as credit risks; asset and liability/balance sheet risks, foreign exchange risks, internal control and compliance risks and money laundering risks were issued. In 2005, it issued another separate guideline on Information and Communication Technology. Though these guidelines have addressed the issue of operational risk management in a piece-meal manner, a comprehensive document in line with Basel Committee's requirements is yet to be initiated. It can also be noted that the exact nature of operational risks depends on the dynamics of the financial institute and its business environment. Therefore the New Basel Accord has recognized, rather than specifying, the major sources of operational risks. Individual banks will require identifying, assessing and monitoring the operational risks that they are exposed to. In this case, two strategies may be followed. As a supervisor, Bangladesh Bank may, given the existing market scenario, produce a generic version of such a document and instruct the banks to develop their own guidelines following that version. Alternatively, the Bangladesh Bank may instruct the scheduled banks to prepare and document their guidelines on managing operational risk in line with the above principles that are applicable to them. However, such initiation will be a sound footing for the banks to adopt any of the above three approaches.

Considering the other qualifying criteria, it can be argued that, among the three approaches, BIA is simpler than SA/ASA, and that AMA is more sophisticated than either of the other two approaches. In BIA, banks will require to charge capital 15 percent of their gross income. In SA/ASA, banks will have to charge capital 12-18 percent of their gross income in individual business units as appropriate. It indicates that the adoption of earlier two approaches may not cause for significant difference in terms of capital requirement for the banks. However, adoption of SA will require the banks to report their gross income in terms of business lines as defined by the Basel Committee. It can be mentioned that at present banks prepare their profit and loss statement as per First Schedule of Bank Company Act 1991. This statement includes gross income of individual banks. If BIA is adopted, banks will be easily able to calculate minimum capital requirement against their exposure to operational risk. If SA is adopted, banks will require to maintain two types of income accounts (i) one will be to fulfill the requirement of BCA, 1991 and (ii) another will be for the purpose of the Basel requirement. It may create regulatory burden for those banks, which have large branch network such as the NCBs. Adoption of AMA may require the banks to charge less capital than either BIA or SA/ASA. Because the New Accord requires that the capital charge for AMA will equal the greater of (1) the risk measure generated by the bank's internal operational risk measurement system using the supervisory soundness standards and (2) a floor equal to 75 percent of the Standardized Approach capital charge for operational risk. However, in adopting AMA, banks will face some challenges, particularly to meet the quantitative standards as mentioned above. It also requires extensive preparation and adequate resource allocation on the part of both banks and their supervisory authorities.

(b) Global banking perspective

A survey conducted by FSI (2004) in 107 jurisdictions showed that more than hundred countries around the world would implement Basel II. However, most would start to implement it during 2007-09. In implementing capital requirement for operational risk, the greatest portion of their banking assets will be subject to BIA (see Chart 4.1).

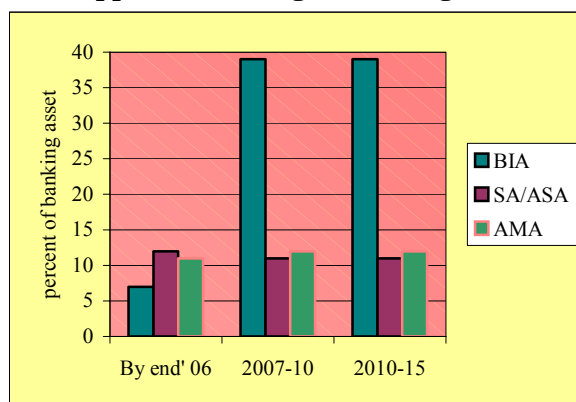
Chart 4.1: Overall percentage of banking assets expected to be subject to operational risk approaches in Basel II (weighted average)



(c) Asian banking perspective

The survey result shows that that low level of banking asset in Asia will be subject to Operational Risk by the end of 2006. After that, a significant proportion of banking assets in Asia will be subject to Operational Risk. However, in case of adoption of approaches by 2006, SA/ASA and AMA are more likely to be adopted than the BIA. Then there will be a major change in adoption of approaches and BIA will be more likely to be adopted by the majority of the banks in Asia. Though SA/ASA and AMA are more sophisticated than BIA and adoption of the former approaches require a lot of efforts in terms of human resources, data availability and technology, higher adoption of those approaches by 2006 may be questioned. The banks that are planning to implement them are in fact either locally incorporated foreign controlled banks or branches of foreign banks. The local banks in Asia are mostly interested in implementing BIA. Consequently, application of SA/ASA and AMA after 2006 will remain relatively stable and adoption of BIA will increase significantly (see Chart 4.2).

Chart 4.2: Banking assets expected to be subject to operational risk approaches (weighted average) in Asia



The above analysis indicates that BIA may be more appropriate than either of SA or AMA for the banking sector of Bangladesh.

4.4 Implementation modalities

Supervisor and general depositors see the primary function of banks’ capital as protection against insolvency. However, if capital charge for operating risk heavily undermines banks’ capital, it may downgrade banks’ composite ratings and may constraint their operational activities due to regulatory restrictions imposed by the supervisor. Jackson et al. (2002) argue that banks may be constrained by the capital requirements from increasing lending or may have to reduce lending, thereby causing a credit crunch and affecting the real economy. On the other hand, implications of operational risk in terms of shareholders’ point of view need to be considered. Since majority of the banks in Bangladesh are listed

public limited companies, motivation of the general shareholders of banks is to get, compared to other listed securities, expected rate of return on their investment. If capital charge for operational risk heavily influences banks' capital and cause for significant capital shortfall, existing regulation, as contained in the BRPD circular no. 10/2003, will not allow the banks to pay cash dividend to their shareholders. If the problem persists for a reasonable period, investors may not be motivated to further inject capital. In such a situation, if banks are compelled to increase capital by regulatory requirement without providing incentive for a reasonable return, market price of bank companies' shares may substantially decline which in turn may cause for a broad downward movement of stock markets in Bangladesh. It is therefore important to know how far the capital charge for operational risk will affect bank's capital in terms of capital adequacy norms set by the New Accord.

Note that Bangladesh Bank vide BRPD Circular No. 8/2002 instructed the scheduled banks to maintain a ratio of capital to risk-weighted-asset of not less than 9 percent with at least 4.5 percent in core capital. Another significant change was brought in 2003 by amending BCA 1991. This change requires all scheduled banks to maintain minimum capital of BDT 1 billion or risk-based capital whichever is higher. If capital is charged against operational risk, banks will be required to maintain capital in addition to the above requirements. In order to observe the impact of operational risk on banks' capital, back-testing method has been followed and applied on banks' preceding four years' capital position. The finding shows that most of the banks in Bangladesh may suffer from under capitalization due to full implementation of operational risk (see Chart 4.3). Therefore, it can be argued that instead of charging 15 percent of gross income as capital requirement for operational risk, phase-wise implementation may be a better alternative for smooth transition to Basel II. In that case, Bangladesh Bank may require the banks to charge 10 percent of gross income as capital requirement against operational risk for the first two years of implementation and then may ask for implementation of the full requirement observing the banks' capital position.

Chart 4.3: Capital position of scheduled banks before and after charging capital for operational risk



5 Conclusion: In order to measure credit risk and calculate the minimum capital requirement against it, Bangladesh may follow either Simplified Standardized Approach (SSA) or Foundation IRB Approach. In fact, adoption of SSA will not require any major preparation either by the banks or the supervisor. However, recent changes in the banking sector in terms of risk management practices signal that banking system is gradually becoming conducive for adoption the IRB Foundation Approach. It requires updating of Credit Risk Grading Manual to be consistent with the New Basel Accord and also requires some other preparations such as redesigning the information system of the Credit Information Bureau (CIB) and equipping Bangladesh Bank's respective staffs with need-based advanced training. In order to charge capital for operational risk, Basic Indicator Approach (BIA) may be more appropriate than either the Standardized Approach (SA) or the Advanced Measurement Approach (AMA). Since charging 15 percent of gross income as capital requirement for operational risk may undermine banks' capital position, phase-wise implementation may be a better alternative for a smooth transition to Basel II.

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