

## Facing up to the issues in implementing Basel II

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### **Abstract**

The New Basel Accord (known as Basel II) issued by the Basel Committee on Banking Supervision extends the existing requirements for banks to make capital allocations against risk exposure. The New Basel Accord now includes operational risk as well as credit risk and market risk. This major change recognises two things: firstly, that operational risk represents a 'black hole' in risk management across the banking industry as a whole, because it is impossible to calculate any meaningful 'value at risk' (VAR) without reliable statistical data on operational losses, and these data do not currently exist; and secondly, that many banking institutions have begun to tackle this problem in recent years by developing new quantitative approaches to measuring VAR with regard to operational risk, and the Basel Committee wants to encourage these developments by offering the incentive of reduced capital allocation traded against improved sophistication of risk measurement. In addition, the New Basel Accord introduces a new three-pillar approach, in which Pillar 1 is the existing allocation of capital against VAR, Pillar 2 is the enhanced supervision of risk management in banks by national banking regulators, and Pillar 3 is improved public disclosure to market participants with regard to each bank's risk exposure and risk management practices.

Although the New Basel Accord provides a high-level framework within which to manage operational risk and to calculate the capital allocations against VAR, as soon as one scratches the surface one uncovers a large number of issues that will need to be addressed before an operational risk management framework can be implemented in the real world. This paper first summarises the latest position regarding the New Basel Accord and explores the meaning of operational risk in this context. In part 2 it then addresses some of the major issues facing the banking industry as a whole and the individual banks within it.

### **Preface**

The first part of this paper headed 'Introduction' provides an overview and high-level tutorial on Basel II and its background. This introduction is aimed at those readers who are not fully informed on these areas. The material is drawn exclusively from the official Basel Committee publications and is presented in a highly edited form to create a concise overview. Full references are provided to the source documents. Readers who would like greater detail are recommended to read those documents for themselves. They are of an exceptionally high editorial quality and are therefore very readable. Those readers who are already familiar with the content of Basel II, especially those who have read CP3<sup>1</sup>, will probably want to skip over this introduction and focus on the 'meat' of the paper in the second part, headed 'Addressing the Issues'.

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<sup>1</sup> Consultative Document: The New Basel Capital Accord (April 2003) Issued for comment by 31 July 2003  
<<http://www.bis.org/bcbs/cp3full.pdf>>

## Part 1: Introduction

### ***What is the Basel Committee for Banking Supervision<sup>2</sup>?***

The Basel Committee on Banking Supervision is a committee of banking supervisory authorities, which was established by the central bank governors of the Group of Ten (G10) countries in 1975. It consists of senior representatives of bank supervisory authorities and central banks from Belgium, Canada, France, Germany, Italy, Japan, Luxembourg, the Netherlands, Sweden, Switzerland, the United Kingdom and the United States.

The committee is one of several committees set up under the auspices of the Bank for International Settlements<sup>3</sup> (BIS). The Basel Committee meets regularly four times a year. It has about thirty technical working groups and task forces, which also meet regularly. The ten countries are each represented by their central bank and also by the authority with formal responsibility for the prudential supervision of banking business where this is not the central bank.

The Committee does not possess any formal supranational supervisory authority, and its conclusions do not have legal force. Rather, it formulates broad supervisory standards and guidelines and recommends statements of best practice in the expectation that individual authorities will take steps to implement them through detailed arrangements that are best suited to their own national systems.

### ***What is the Basel Capital Accord<sup>4</sup>?***

Published by the Basel Committee on Banking Supervision in 1988, the Basel Capital Accord sets down the agreement among the G10 central banks to apply common minimum capital standards to their banking industries, to be achieved by end-year 1992. The objective was to introduce international convergence of capital measurement and capital standards. The standards are almost entirely addressed to credit risk, the main risk incurred by banks.

In recent years, five amendments to the Accord have been agreed, for four of which specific changes to the text of the original Accord have been published. The fifth of these amendments, which introduces parallel capital requirements for market risk, does not include amendments to the original 1988 text. This amendment was issued as a separate document in January 1996 and is published as "*Amendment to the capital accord to incorporate market risks*". Operational risk is not addressed either in the original 1988 Accord or in any of the subsequent amendments.

### ***What is the New Basel Capital Accord<sup>5</sup>?***

In January 2001 the Basel Committee on Banking Supervision issued a proposal for a New Basel Capital Accord that, once finalised, will replace the current 1988 Capital Accord. The proposal is based on three mutually reinforcing pillars that allow banks and supervisors to evaluate properly the various risks that banks face (See Table 1).

### ***Pillar 1: Minimum Capital Requirements<sup>6</sup>***

The 1988 Accord is based on the use of a capital ratio calculated by taking the total amount of capital that a bank has available – also called the 'regulatory capital' (the numerator of the ratio) and dividing it by the value of the risks faced by the bank – also known as the 'risk-weighted assets' (the denominator of the ratio). The resulting ratio must be no less than 8%, thus setting a minimum level for capital.

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<sup>2</sup> The Basel Committee on Banking Supervision <<http://www.bis.org/bcbs/aboutbcbs.htm>>

<sup>3</sup> BIS Home Page <<http://www.bis.org/>>

<sup>4</sup> Basel Committee Publications No.4 (July 1988) <<http://www.bis.org/publ/bcbs04a.htm>>

<sup>5</sup> The New Basel Capital Accord: Latest News (April 2003) <<http://www.bis.org/publ/bcbsca.htm>>

<sup>6</sup> Consultative Document: Overview of the New Basel Capital Accord (April 2003) Issued for comment by 31 July 2003 <<http://www.bis.org/bcbs/cp3ov.pdf>>

**Table 1: The Three Pillars of the New Basel Accord**

<b>Pillar 1:</b>	<b>Minimum capital requirements</b>	Seeking to refine the measurement framework set out in the 1988 Accord by providing flexibility in the measurement approach as an incentive for banks to adopt more sophisticated measurement methods in exchange for reduced capital allocations, and including operational risk in the value at risk (VAR) measurement of the capital allocation framework
<b>Pillar 2:</b>	<b>Supervisory review</b>	Supervision of an institution's capital adequacy and internal assessment process on a national regulatory authority level
<b>Pillar 3:</b>	<b>Market discipline</b>	Effective public disclosure of information to encourage safe banking practices, discourage reckless risk-taking and enhance public confidence in the banking industry as a whole

In the new Accord the capital ratio concept is essentially the same, with the same numerator and the same overall 8% minimum capital requirement. The difference is that there are new ways of calculating the risk-weighted assets – the risks faced by a bank. There are optional methods of measuring risk and calculating the 'value at risk' (VAR), many of which offer the opportunity for a bank to take a more sophisticated approach than under the previous Accord, and by doing so reduce the denominator and hence the amount of capital required to maintain the ratio at the required level of 8%. The modified approach has two main elements: (1) changes in the treatment of credit risk and (2) the introduction of an explicit treatment of operational risk to bring a measure of 'value at operational risk' into the denominator of the ratio.

The major changes are the introduction of three distinct levels of sophistication in the calculation of both credit risk and operational risk, each level providing an improved 'risk sensitivity' with respect to the one preceding it. This moves away from the previous philosophy of 'one size fits all' and allows individual banks to select the approach most suited to their own situation. Table 2 summarises these various approaches to risk measurement.

**Table 2: Approaches to Measuring Value at Risk in the New Basel Accord**

<b>Level</b>	<b>Credit Risk</b>	<b>Operational Risk</b>
1	Standardised Approach	Basic Indicator Approach
2	Foundation IRB <sup>7</sup> Approach	Standardised Approach
3	Advanced IRB Approach	Advanced Measurement Approach

### ***Standardised Approach to Credit Risk***

This is similar to the current Accord. Banks are required to classify their credit exposures under a number of supervisory categories such as 'inter-bank loan', 'corporate loan', 'residential mortgage loan', etc. There is a fixed risk weight for each supervisory category, but new external credit assessments can be used under the New Accord to improve the risk sensitivity with respect to the weighting. Where no external rating is applied, in most cases the mandatory weighting for that category is 100%, as in the current Accord.

The new Accord also expands the range of financial instruments (such as collateral, guarantees and credit derivatives) that may be used as credit risk mitigants, and sets out several approaches to assessing the degree of capital reduction that may be made based upon the market risk for the mitigating instrument. The range of

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<sup>7</sup> IRB: internal ratings-based

guarantors is also extended to include all firms that meet a specified threshold for an external credit rating. Another change is the special treatment of retail credit exposures, especially relating to residential mortgages where the risk weights are being reduced. Some loans to SMEs<sup>8</sup> that meet certain criteria may also be included in the 'retail' group.

### **Internal Ratings-based (IRB) Approaches to Credit Risk**

This approach, which has two levels – 'Foundation' and 'Advanced', – is a major innovation. In both cases the Accord defines formulae and risk weight functions by which the VAR is calculated from four defined input parameters, but the values of these input parameters are assessed through the bank's own internal methods, which must be based on statistical analyses and hence must be quantitative. The four input parameters are summarised in Table 3.

**Table 3: Input Parameters for IRB Approaches to Credit Risk Measurement**

<b>Input Parameter</b>	<b>Foundation IRB</b>	<b>Advanced IRB</b>
Probability of default (PD)	Provided by bank based on own estimates	Provided by bank based on own estimates
Loss given default (LGD)	Supervisory values set by the Committee	Provided by bank based on own estimates
Exposure at default (EAD)	Supervisory values set by the Committee	Provided by bank based on own estimates
Maturity	Supervisory values set by the Committee or At national discretion, provided by bank based on own estimates (with an allowance to exclude certain exposures)	Provided by bank based on own estimates (with an allowance to exclude certain exposures)

Another important element of the IRB framework is the ability to use credit risk mitigants in the form of collateral, guarantees and credit derivatives in calculating the LGD parameter, including those supervisory values that are set by the Committee for the Foundation level.

The use of the two IRB levels applies to corporate, sovereign and inter-bank exposures. For retail exposures only the Advanced IRB approach applies, and there is no Foundation level. Retail exposures are divided into three primary categories: (1) exposures secured by residential mortgages, (2) qualifying revolving retail exposures (such as credit card relationships), and (3) other retail exposures. A separate risk weight is specified for each category.

There is also a separate group of loans in the corporate arena that are treated as a special case and are known as 'specialised lending'. These refer to the financing of individual projects where the repayment is highly dependent upon the financial performance of the pool of assets. If certain minimum criteria are met, most of these loans can be treated as normal corporate loans. If not, these special loans must be qualified into one of five quality grades, and a risk weighting is specified for each grade. For one category, 'highly volatile commercial real estate', a bank that can estimate the required data input parameters is allowed to use a special formula that will give a more advantageous risk weight. If the bank cannot estimate these inputs, then the exposure must be classified on the five-point quality scale.

<sup>8</sup> SME: Small- to medium-sized enterprise

For banks using IRB approaches they are required to treat their equity exposures separately. There are two alternatives: (1) based on the PD/LGD approach for corporate exposures, but mandating a 90% value for LGD and imposing certain other limitations including a minimum risk weight of 100% in many cases, and (2) the bank may model the potential decrease in market value of its equities holdings over a quarterly holding period. There is also a simplified version of option (2) with fixed risk weights for public and private equities holdings.

### **Securitisation<sup>9</sup>**

Securitisation is a risk management technique by which ownership and/or risks associated with the credit exposures of a bank are transferred to other parties. It is used to spread risk across diverse ‘baskets’<sup>10</sup> and to enhance financial stability. The Basel Committee intends that securitisation be treated robustly under the New Accord to avoid vulnerability to capital arbitrage, whereby some banks have successfully avoided maintaining capital commensurate with their risk exposures under the current Accord. The New Accord therefore requires banks to look carefully at the economic substance of securitisation transactions when assessing the appropriate capital requirement in both the standardised and IRB approaches. Various criteria are set out for assessing the quality of a securitisation transaction, both for ‘originating banks’ that lay off risk through such transactions and for ‘investing banks’ that assume economic responsibility for such risks as a specialised line of business.

### **Operational Risk<sup>11</sup>**

The inclusion of operational risk in the New Accord is another major innovation. Over recent years there has been a growing emphasis on the use of highly automated technical systems in the banking industry, much of it associated with the growth of electronic banking. There have also been many large-scale mergers and acquisitions amongst banks that test to the limit the viability of newly integrated systems and position the merged banks as high-volume service providers. At the same time there has been a major shift towards outsourcing the operation of these technical systems to third party service providers. All of this suggests that operational risk exposures in banks are substantial and growing, and yet the industry as a whole has no real grasp on how large or small this risk may be, and whether it has the potential to trigger systemic failures across a number of banks. These then are the key drivers for introducing operational risk into the New Accord.

Within the Basel II framework, operational risk is defined as “the risk of losses resulting from inadequate or failed internal processes, people and systems, or external events.” Some commentators often say that operational risk refers to all risks not included under credit risk or market risk, but this is not true under this definition in the New Accord. It includes internal and external fraud risks, risks associated with employment practices and workplace health and safety, risks associated with clients, products and business practices, risks of damage to physical assets, risks of business disruption and system failures, legal risks, risks of failure in execution, delivery and process management and other sundry unspecified operational risks. However, this definition specifically excludes reputation risk, strategic business risk and systemic risk. The use of the word ‘losses’ also needs clarification, since it is not the intention of the New Accord to require capital allocation against all indirect losses such as opportunity cost.

The exclusion of reputation risk, strategic risk and systemic risk is reasonable on the grounds that the Basel Committee wishes to build on the rapidly developing internal assessment techniques in the operational risk arena, and wishes to provide banks with incentives to improve those techniques even further. These incentives are in the form of reduced capital allocations where the more sophisticated risk measurement approaches are used. The operational risk measurement techniques being developed are quantitative and based upon applying statistical models to estimate ‘value at operational risk’. To include those risks that are excluded would present the banks with huge difficulties in implementing the Accord, since it is clear that the mathematical models for those risks are far more complex than for operational risk within the definition.

Taking reputation risk as an example, anecdotal evidence suggests that reputations can survive a long series of serious events without too much damage, and that the small amounts of damage suffered can be quickly recovered. Then, one day an event comes along that does not seem different from its predecessors, but it turns out to be the ‘straw that breaks the camel’s back’ and at this point the reputation of the firm collapses

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<sup>9</sup> Consultative Document: The New Basel Capital Accord (April 2003) Issued for comment by 31 July 2003  
<<http://www.bis.org/bcbs/cp3full.pdf>>

<sup>10</sup> As in: not putting all one’s eggs in a single basket

<sup>11</sup> Working Paper on the Regulatory Treatment of Operational Risk (September 2001) <[http://www.bis.org/publ/bcbs\\_wp8.htm](http://www.bis.org/publ/bcbs_wp8.htm)>

catastrophically. This catastrophic failure is far more complex than the losses incurred under the more straightforward operational risks, and its quantitative modelling would be a major challenge if it were included at the present time. It is possible that, had these more complex risks been included in the New Accord, the entire initiative would have failed through being 'too difficult' to implement. No doubt the Committee has an eye on the future for inclusion of these more complex risks when the techniques for modelling them have evolved to a sufficiently usable level.

However, this does raise a number of concerns about whether the New Accord is really solving the operational risk problem in the banking industry in terms of preventing banks from failing catastrophically. A cynic might comment that the New Accord requires a bank to measure certain operational risks 'because it can' and that those areas that are 'too difficult' to measure are excluded, yet it these very exclusions where the largest potential business impacts are to be found. Reputation risk, systemic risk and strategic risk are all more likely to be 'tail risks', meaning that they are very low probability events with very high impact, found in the 'tail' of the statistical probability distribution (see Figure 1).

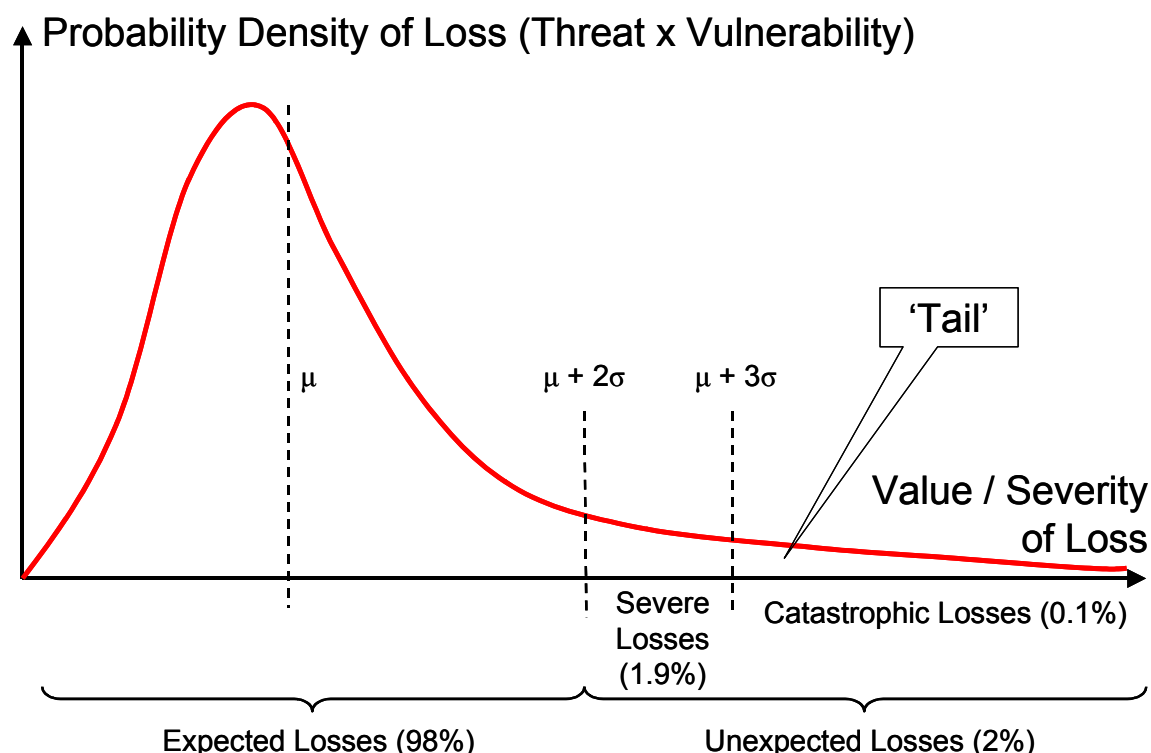


Figure 1: The Statistical Distribution of Loss Events

The computation of a VAR for a particular loss event is usually around some formula that has the fundamental structure:

$$\text{VAR} = \text{Value of Potential loss} \times \overbrace{\text{Probability of the event} \times \text{Probability of failure of controls}}^{\text{Probability of Loss}}$$

**Impact x Threat x Vulnerability**

The combined probability density function for both the probability of the event occurring and the probability of the controls failing is shown in Figure 1. In the diagram the probability distribution is Poisson-like, with an asymptotic probability density curve to the right-hand side, forming the 'tail' of the distribution. The mean ( $\mu$ ) and standard deviation ( $\sigma$ ) are the key parameters of the distribution. Approximately 98% of loss events fall within the range:

$$0 < \text{loss value} < \mu + 2\sigma$$

That is, below the 'mean plus two standard deviations', and you might choose to call this range the 'expected losses' – the cost of doing business. That leaves the 'tail losses' as being 'unexpected' and you might choose to divide this range again at ( $\mu + 3\sigma$ ) into 'severe losses' and 'catastrophic losses'. The aim of applying controls is to push the mean ( $\mu$ ) as far to the left as possible (i.e. to minimise the mean value of losses) and to minimise the standard deviation ( $\sigma$ ) so that the ranges up to ( $\mu + 2\sigma$ ) and ( $\mu + 3\sigma$ ) are reduced. That would allow you to designate 'severe' and 'catastrophic' losses at four, five or even six standard deviations to the right of the mean, thus greatly reducing the probability of these types of loss.

However, there are complex problems associated with applying statistical methods. Measuring the actual statistical parameters (mean and standard deviation) can only be done if you have suitable loss-event data available, and one of the major problems facing those who wish to pursue quantitative statistical methods for operational risk is that such statistical data is usually not available. At best there is patchy, inconsistent, largely anecdotal information about previous losses. Even if you do accumulate a well-populated loss database, then there is still the problem that measuring the past history may not be a good indicator of the future.

In the case of catastrophic 'tail risks' the value of a potential loss is close to infinity in terms of the firm's ability to absorb it, and the probability of a loss event occurring is close to zero. The multiplication of infinity by zero yields a mathematically indeterminate result, and so the application of simple VAR computations in these cases is very dubious. There is also the problem that one cannot estimate a very low probability by looking at a loss database that contains zero occurrences of that event. The sample of previous events is simply not available to provide the input data, and you have to rely entirely on values of mean and standard deviation for predicting tail probabilities. At that point the potential errors in your measured values of  $\mu$  and  $\sigma$  can become very significant. For all sorts of reasons, the mathematical models needed here are far more complex.

There is yet another aspect of complexity to be considered. Operational risk is in itself a complex and integrated thing. Just because you classify risks into silos for the convenience of identifying and managing them does not mean that they actually possess that discrete granularity. In practice, risks are interlinked in a complex web of interactions. Mitigating one operational risk almost always increases at least one other risk area, and hence the actions to manage and mitigate operational risks are often in conflict with one another<sup>12</sup>. This is frequently misunderstood and overlooked, because attempts to separate operational risks for classification purposes can suggest that they are discrete. This is certainly a problem with the public perceptions of risks that relate to everyday living, and many risk professionals do not always maintain sufficient awareness of this complexity when dealing with operational risk in the workplace. One fact that greatly exacerbates this problem is that operational risk management in most organisations is fragmented across many different functional departments<sup>13</sup>, each with detailed knowledge of its own risk area, but without the visibility of how their mitigating actions affect and conflict with risk management goals in other departmental areas.

The excluded risk areas under the New Basel Accord are also clearly linked with many of the risks that are included. For example, almost any operational risk that has a serious impact has the potential to damage the reputation of the firm. In another example, if a firm makes a poor strategic acquisition of another firm so as to move into a new business area, and this attempt to diversify fails causing heavy financial losses, then it is clearly an outcome of a strategic risk event, yet it may well have been caused in part by failure of a due diligence process which is well within the New Accord definition of operational risk. Nothing is ever simple!

To understand more fully the complexity of this high level of integration between risk areas one needs to look behind the definition of the term 'risk' itself. The definition of operational risk provided in the New Basel Accord focuses upon the underlying causes of loss (the threats), rather than on the nature of the losses

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<sup>12</sup> Consider the conflict between protecting the safety of occupants of a building by providing easily opened escape doors in case of fire, and the requirements to keep all the doors locked so as to prevent unauthorised access. There have been many tragic events, especially in nightclubs and similar venues, where this conflict has led to multiple deaths and injuries.

<sup>13</sup> Typically there is a corporate security team, a legal team, an insurance team, an IT security team, a public relations team, a health and safety team, and so on, each working relatively independently of one another and unaware of the conflicts between each others' risk areas.

themselves. This perspective is especially useful for managing operational risk in financial institutions and for introducing control regimes to mitigate risks.

However, for the purposes of measuring operational risk and especially for providing standardised definitions of loss quantification that can be shared and pooled across different banks, it is more useful to focus upon actual measurable events. These events may have several contributory causes interacting with one another, many of which are not easily understood. To make capital allocation against these potential events the bank must translate the outcome of the event (business impact) into an effect on the P&L of the bank. Thus operational risk needs to be viewed and analysed from a number of different perspectives.

### **Basic Indicator Approach**

In this, the simplest approach to calculating the capital allocation requirement for operational risk, the bank's annual gross income (GI) is averaged over the previous three years. To generate the capital charge using the basic indicator approach ( $K_{BIA}$ ) this average is then multiplied by a factor ( $\alpha$ ) of 15% that has been set by the Basel Committee.

$$K_{BIA} = GI \times \alpha$$

There are no specific criteria governing the use of this approach and any bank may choose to do so, but it is intended as an entry-level approach for smaller banks that lack the resources and sophistication to use the higher level approaches. However, banks using this approach are still expected to comply with the Committee's guidance on sound practices for the management and supervision of operational risk<sup>14</sup>.

Banks using the basic indicator approach are not permitted to recognise the risk mitigating effects of insurance.

### **Standardised Approach**

In the standardised approach estimating the size of business operations is once again based upon gross income (GI) as in the basic indicator approach, but rather than being used as a single enterprise wide value, it is split up under the different lines of business carried out by the bank. The New Accord defines eight standard business lines under which the bank must allocate its business: corporate finance, trading & sales, retail banking, commercial banking, payment & settlement, agency services, asset management, and retail brokerage. Thus the capital requirement using the standardised approach ( $K_{TSA}$ ) is calculated for each line of business rather than for the entire firm. Each line a business has a supervisory factor ( $\beta$ ) defined for it by the Committee, ranging between 12% and 18%, and the total capital charge ( $K_{TSA}$ ) is the sum of the individual capital charges by line of business.

$$K_{TSA} = \sum_{i=1 \text{ to } 8} GI_i \times \beta_i$$

It is a condition of using the standardised approach (and the AMA – see below) that the bank must have adequate operational risk systems that comply with the minimum criteria defined by the Committee. These are:

- The board of directors and senior management, as appropriate, must be actively involved in the oversight of the operational risk management framework.
- The bank must have a risk management system that is conceptually sound and is implemented with integrity.
- The bank must have sufficient resources in the use of the approach in the major business lines as well as in the control and audit areas.

Internationally active banks wishing to use the standardised approach must meet these additional criteria:

- The bank must have an operational risk management system with clear responsibilities assigned to an operational risk management function. The operational risk management function is responsible for developing strategies to identify, assess, monitor and control/mitigate operational risk; codifying firm-level policies and procedures concerning operational risk management and controls; for the design and implementation of the firm's operational risk assessment methodology; for the design and implementation of a risk-reporting system for operational risk.

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<sup>14</sup> Sound Practices for the Management and Supervision of Operational Risk (February 2003) <<http://www.bis.org/publ/bcbs96.pdf>>



- As part of the bank's internal operational risk assessment system, the bank must systematically track relevant operational risk data including material losses by business line. Its operational risk assessment system must be closely integrated into the risk management processes of the bank. Its output must be an integral part of the process of monitoring and controlling the bank's operational risk profile. For instance, this information must play a prominent role in risk reporting, management reporting, and risk analysis. The bank must have techniques for creating incentives to improve the management of operational risk throughout the firm.
- There must be regular reporting of operational risk exposures, including material operational losses, to business unit management, senior management, and to the board of directors. The bank must have procedures for taking appropriate action according to the information within the management reports.
- The bank's operational risk management system must be well documented. The bank must have a routine in place for ensuring compliance with a documented set of internal policies, controls and procedures concerning the operational risk management system, which must include policies for the treatment of non-compliance issues.
- The bank's operational risk management processes and assessment system must be subject to validation and regular independent review. These reviews must include both the activities of the business units and of the operational risk management function.
- The bank's operational risk assessment system (including the internal validation processes) must be subject to regular review by external auditors and/or supervisors.

Banks using the standardised approach are not permitted to recognise the risk mitigating effects of insurance.

### ***Advanced Measurement Approaches (AMA)***

Under the AMA, the regulatory capital requirement is computed using the bank's own internal operational risk measurement system. The bank is also permitted to include the effects of insurance in mitigating operational risks, not to exceed 20% of its total operational risk capital requirement. It is expected that larger banks with international business activities and significant operational risk exposures will adopt the AMA to take advantage of the more risk-sensitive approaches that it offers.

Before a bank is permitted to use the AMA, there are quantitative and qualitative criteria for the AMA defined by the Committee, which must be met, and use of AMA is subject to supervisory approval. Banks adopting the AMA will be required to calculate their capital requirement using this approach as well as the existing Accord for a year prior to implementation of the New Accord at year-end 2006. Thus they must be ready a year earlier than those opting for other approaches.

The criteria that must be met before use of the AMA will be approved by the national supervisory authority are:

### ***Qualitative Criteria for Using the AMA***

- 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. The operational risk management function is responsible for codifying firm-level policies and procedures concerning operational risk management and controls; for the design and implementation of the firm's operational risk measurement methodology; for the design and implementation of a risk-reporting system for operational risk; and for developing strategies to identify, measure, monitor and control/mitigate operational risk.
- The bank's internal operational risk measurement system must be closely integrated into the day-to-day risk management processes of the bank. Its output must be an integral part of the process of monitoring and controlling the bank's operational risk profile. For instance, this information must play a prominent role in risk reporting, management reporting, internal capital allocation, and risk analysis. The bank must have techniques for allocating operational risk capital to major business lines and for creating incentives to improve the management of operational risk throughout the firm.
- There must be regular reporting of operational risk exposures and loss experience to business unit management, senior management, and to the board of directors. The bank must have procedures for taking appropriate action according to the information within the management reports.

- The bank's risk management system must be well documented. The bank must have a routine in place for ensuring compliance with a documented set of internal policies, controls and procedures concerning the operational risk management system, which must include policies for the treatment of non-compliance issues.
- Internal and/or external auditors must perform regular reviews of the operational risk management processes and measurement systems. This review must include both the activities of the business units and of the independent operational risk management function.
- The validation of the operational risk measurement system by external auditors and/or supervisory authorities must include the following:
  - Verifying that the internal validation processes are operating in a satisfactory manner;
  - Making sure that data flows and processes associated with the risk measurement system are transparent and accessible. In particular, it is necessary that auditors and supervisory authorities have easy access, whenever they judge it necessary and under appropriate procedures, to the system's specifications and parameters.

### **Quantitative Criteria for Using the AMA**

- Given the continuing evolution of analytical approaches for operational risk, the Committee is not specifying the approach or distributional assumptions used to generate the operational risk measure for regulatory capital purposes. However, a bank must be able to demonstrate that its approach captures potentially severe 'tail' loss events. Whatever approach is used, a bank must demonstrate that its operational risk measure meets a soundness standard comparable to that of the internal ratings based approach for credit risk, (i.e. comparable to a one year holding period and a 99.9 percent confidence interval).
- The Committee recognises that the AMA soundness standard provides significant flexibility to banks in the development of an operational risk measurement and management system. However, in the development of these systems, banks must have and maintain rigorous procedures for operational risk model development and independent model validation. The Committee will review progress in regard to operational risk approaches by the end of 2006 in view of the evolution of industry practices that are sufficient to produce credible and consistent estimates of potential losses. It will also review accumulated data, and the level of capital requirements estimated by the AMA, and may refine its proposals if appropriate.
- There are many more detailed quantitative criteria for using the AMA specified under the current proposals for the New Accord. The reader is recommended to refer to paragraphs 629 – 639 inclusive in CP3<sup>15</sup> for this detail.

### **Managing Operational Risk<sup>16</sup>**

The Basel Committee has set out ten principles for the sound management and supervision of operational risk in banks:

1. The Board of Directors must be aware of major aspects of the bank's operational risks and should approve the bank's operational risk management framework
2. The Board of Directors should ensure that the bank's operational risk management framework is subject to comprehensive, independent, internal audit
3. Senior management should have responsibility for implementing the operational risk management framework consistently across the bank
4. Banks should identify and assess the operational risks inherent in all its activities

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<sup>15</sup> Consultative Document: The New Basel Capital Accord (April 2003) Issued for comment by 31 July 2003  
<<http://www.bis.org/bcbs/cp3full.pdf>>

<sup>16</sup> Sound Practices for the Management and Supervision of Operational Risk (February 2003) <<http://www.bis.org/publ/bcbs96.pdf>>

5. Banks should implement a process to monitor operational risks and material losses, with regular reporting to senior management
6. Banks should have policies, processes and procedures to control and/or mitigate operational risks
7. Banks should have adequate contingency and business continuity plans to ensure their ability to operate and limit losses in the event of a severe business disruption
8. Banking supervisors should require all banks to have an effective operational risk management framework
9. Supervisors should conduct regular independent evaluation of a bank's operational risk management framework
10. Banks should make sufficient public disclosure to allow market participants to assess their operational risk management stance

### **Other Risks**

Other areas of banking risk such as interest rate risk and liquidity risk are not included within the Pillar 1 proposals for risk measurement. These risks are addressed solely through Pillar 2 and Pillar 3 of the New Accord.

### **Pillar 2: Supervisory Review<sup>17</sup>**

This second pillar of the New Accord is based upon a number of guiding principles, which spell out the need for the banks to assess their capital adequacy relative to their overall risk exposures, and for supervisors to review and take appropriate actions in response to those assessments. This is a key component in effective banking supervision.

One key principle of pillar two is that the assessment of risk and capital adequacy requires more than a simple assessment of whether the bank meets the minimum capital requirements. The supervisory review emphasises the need for both the banks and supervisors to have in place strong risk assessment capabilities and processes.

It is inevitable that any capital adequacy framework will lag to some extent behind the changing risk profiles of complex banking organisations, particularly as they take advantage of newly available business opportunities. Accordingly, this heightens the importance of, and attention supervisors must pay to pillar two.

The Committee is working on several refinements to the pillar two principles. These include:

- Stress testing – to estimate the extent to which capital requirements for credit risk might increase during a stress scenario caused by adverse or uncertain economic conditions.
- A review of concentration risks associated with certain securitisation exposures.

### **Pillar 3: Market Discipline<sup>17</sup>**

The Committee has sought to encourage market discipline by developing a set of disclosure requirements that allow market participants to assess key information about a bank's risk profile and level of capitalisation. The Committee believes that public disclosure is particularly important with respect to the New Accord where reliance on internal methodologies will provide banks with greater discretion in determining their capital needs.

However, the information made available to the market must be of the right quality and volume, and it is important to avoid flooding the market with information that would be hard to interpret or to use in understanding the bank's actual risk profile. Recognition of this principle has led to a scaling back of the disclosure requirements from the original proposals.

It is also recognised that within different national jurisdictions the legal avenues available to regulators to enforce disclosure by banks vary considerably, and hence the means by which banks will share information publicly will vary according to the legal authority of the supervisor. Similarly the disclosure framework has to be aligned with national accounting standards in all the countries where it will be implemented, and the Committee has spent considerable effort on consultation with those accounting authorities to ensure that this will be achievable.

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<sup>17</sup> Consultative Document: Overview of the New Basel Capital Accord (April 2003) Issued for comment by 31 July 2003  
<<http://www.bis.org/bcbs/cp3ov.pdf>>

## Part 2: Addressing the Issues

### ***Complexity of the New Accord***

The first issue that arises, even before one addresses any of the detailed content of the New Accord, is that it is far more complex than the current Accord<sup>18</sup>. There is a clear distinction between the treatment of credit risk and operational risk, with each category having completely different approaches to calculating the capital allocation against risk. Within each of these two main categories there are also three optional approaches, which means a total of six different schemes that could be implemented. To address these issues banks will need to:

- Estimate the costs of implementation for any proposed approach and analyse the cost/benefit relationship so as to evaluate which of the options best suited their strategic business needs
- Where a progressive strategy is planned, starting simple and evolving to a more sophisticated approach later, planning the migration path for smooth transition<sup>19</sup>
- Appoint specialists to lead and participate in the extensive transformation programme that will be needed to implement the chosen approaches
- Set up a new risk management governance structure and a reporting framework
- Identify the key risk areas within the firm and create a risk model against which to collect and collate risk data
- Implement enterprise-wide processes and systems to monitor and track risks
- Design, build/acquire and implement new automated systems for collecting, storing, processing, integrating and interpreting operational risk data, including losses, events and near misses.
- Develop policies and procedures to demonstrate compliance with the New Accord
- Develop and implement a method of benchmarking the risk management process at regular intervals so as to demonstrate due diligence and a well-managed risk profile
- Raise awareness in the business units where the operational risks actually occur
- Engage with the regulators in all jurisdictions in which they have business activities to ensure approval of the chosen approaches and integration with the supervisory processes
- Calculate capital allocation requirements based upon analysis of detailed operational loss data, including the capture of all low frequency 'tail' risks

This all represents a huge investment in the transformation programme.

### ***New Data Model***

One of the key requirements for measuring operational risk is the capture of loss data from all parts of the business. This data must be maintained over a five-year rolling window of time. Clearly the volumes of data involved in this exercise are huge, which in itself is a major challenge. However, there is much more to be decided to reach this goal. Key questions are:

- What are the actual data items to be collected? What granularity of data is required? What fields must be included in a loss event data record?
- How will the data be captured? What will be the balance between manual and automated data capture?

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<sup>18</sup> According to the Financial Times (FT.com, August 6<sup>th</sup> 2003), The British Bankers' Association is concerned about too much complexity: "The new accord, as currently proposed, is unduly complex and will be difficult for our members to implement and for national regulators, even in the G10, to supervise."

<sup>19</sup> According to the Institute of Financial Services, at the beginning when Basel II is first introduced, 46% of banks intend to use the AMA, 46% the standardised approach and 8% the basic indicator approach. The same respondents say that three years later 83% will use AMA, 14% the standardised approach and only 3% the basic indicator.

- How will the data be stored? Will there be a single central physical store or will the storage be logically unified but physically distributed? If physically distributed, how will logical consistency be enforced and how will the data be integrated for processing and analysis?
- If data collected from different applications differs from one physical repository to another, how will it be normalised to bring it together into a single logical data structure?
- Will the granularity chosen be sufficient to support the data mining, correlation mapping and distribution modelling that will be needed downstream for analysis?
- If the model created initially is wrong, how much impact will that have on the ability to model risks based upon the (inappropriate) data?
- What tools will be needed to do the data management, data mining and statistical analysis and how can their scalability be ensured to meet the volume expectations?
- If banks merge, how will different data models be integrated?
- Can there be a common data model to support pooling of data, especially to investigate and analyse 'tail' risks?

### **Systems Transformation**

To handle the data management issues, banks will need to invest heavily in new information systems. These must bring together data collected on an enterprise-wide basis and must deal with the capture, storage, integration, analysis and reporting of risk information over time in a reliable and resilient manner.

One obvious key question that accompanies this requirement is: should we build or should we buy? Recent investigations of the software products market by several of the larger banks suggest that no single supplier has come up with a software product that provides an integrated enterprise risk management (ERM) solution. Indeed it is almost certain that there never will be a viable 'out-of-the-box' solution, since the potential individual requirements of each bank differ so much. Does that mean that every bank must develop its own custom system? The answer is probably both yes and no. Yes, there will be a need for some custom development, but no, there is no need to start from scratch.

The best solutions will be built by integrating a number of existing 'out-of-the-box' products that have been developed for generic business use. Such products are likely to include business performance management engines, business process mapping and management tools, policy and standards management tools, document management systems and a range of specific risk modelling and risk assessment tools and sub-systems. These products will most likely be integrated into an overall enterprise risk management (ERM) system architecture, and wrapped with a variety of data capture sub-systems (both new and legacy) and MIS<sup>20</sup> reporting and dashboard<sup>21</sup> tools. All these products currently exist in the marketplace and are well established for other business applications (such as financial planning and management). What is innovative about this approach is the application of these tools to risk management by integrating them as 'out-of-the-box' components of a much more complex overall ERM system. This strategy brings together a number of tried and tested components to build an entirely new solution.

Whatever the answer (buy, build or integrate) there is a major systems development programme to be managed. At the same time, there is potentially an opportunity to increase automation and to streamline existing processes. Banks should be looking for these opportunities for added benefits so as to maximise the return on this new investment in systems transformation.

### **Cultural Transformation**

It is predictable that, human nature being what it is, the change in risk management culture that the New Accord requires will meet resistance on a broad front. The changes do not just affect a few people in central head office – they will impact on behaviour, attitudes, underlying assumptions and business practices right across the operational business units in every bank that needs to comply. Everyone who works in a bank will need to be aware in some way or another of the changes in the risk management culture and the impact that has on his or

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<sup>20</sup> MIS: management information system

<sup>21</sup> A 'dashboard' is a conceptual presentation of key performance indicators and key risk indicators to appropriate levels of management.

her job. Managers at all levels will need to take on different and new responsibilities, and it will be crucial to the success of the transformation programme to bring these people 'on-side', to help them to understand the benefits, and to empower them to play important roles in bringing about the transformation itself. This means that there must be new policies and procedures backed up by carefully planned awareness programmes and in some cases retraining of staff for new skills. High quality leadership and championship will be essential to gaining success, and this will test the capabilities of management teams to their limits.

One of the key cultural changes will be the need to take an enterprise-wide view of business events across organisations that have traditionally been run as collections of separate fiefdoms. The collection of operational risk data across multiple systems with starkly different applications requires cooperation and collaboration on a wide scale, hitherto unknown.

### ***Leveraging the Transformation***

In many ways the implementation of the New Basel Accord is like the Y2K event. It has a deadline (although not necessarily so cast in stone – the Committee could move this deadline if it so chose), and it is a major transformation programme requiring large investment and a large highly specialised programme management team to deliver it. As with Y2K, banks should look to see what additional benefits they can reap over and above mere compliance. The question they must address is: 'How can we make the benefits significantly outweigh the costs?'

One potential benefit is the improvement in shareholder value for individual financial institutions and increased market confidence in the banking sector as a whole. This should result from the Pillar 3 proposals for improved market disclosure and transparency.

Another potential benefit is competitive advantage for those who succeed in using the AMA to reduce their capital charges and hence release more capital for other purposes. There is also the potential to differentiate the firm in the marketplace through its superior risk management profile, and the need to get above a certain level even to have basic acceptance in the marketplace. However, there are also sceptics who argue that "the additional burden of costs and procedures placed on the industry may well also materially reduce competition in banking service".

On a completely different front, banks will need to invest heavily in developing excellent data management capabilities in order to comply with the New Accord. This new capability has other possible application areas, and, for example, could be used to enhance the way in which banks mine commercial data for marketing purposes and for CRM applications. There are potentially many new application areas where these new powerful data management techniques can be profitably deployed, and banks should proactively seek out these opportunities so as to maximise the return on the investment in the New Accord.

These and other similar opportunities need to be considered carefully as part of the overall return on investment strategy for this transformation programme.

### ***Insurance***

Under the AMA banks are allowed to use insurance as a means to mitigate up to 20% of the operational risk capital requirement. However, this supposes that suitable insurance products are available in the marketplace. This presents the insurance industry with both an opportunity and a challenge. What range of new insurance products can be developed to offer banks greater opportunities to insure against operational risks? How will the underwriters reach their decisions in the early days, since insurance is based upon actuarial analysis of statistical data, which at present does not exist? Will the insurance market lag behind, waiting until the loss data that the banks will collect becomes available for assessing the risk exposures?

### ***Business As Usual***

Another major issue is that whilst there is all this work to do to get ready for the implementation of Basel II at the end of 2006, there is also a business to run on a day-to-day basis, just as always. There is a danger that whilst the management team are focusing upon these new regulatory issues, they are not keeping their eye on the balls called 'revenue generation' and 'cost reduction' (through outsourcing etc). Certainly the Basel II transformation programme will distract some attention and divert some resources away from 'normal' business activities.

## ***Change Management***

There is also the possibility that some banks will merge, make acquisitions, make divestments, launch new activities, close down existing activities, set up joint ventures or reorganise their structure during the transformation programme. This will require major reviews of the Basel II strategy, since such major changes may well have a major impact on the selected strategy.

Thinking of the longer term and the broader issues, well beyond first implementation, it will be essential to be able to integrate the risk management systems and processes into the overall enterprise change management process so that any significant changes to the business can be reflected by appropriate changes in risk management.

## ***Benchmarking Risk Management Practices***

One of the key components of Pillar 1 for both the standardised approach and the advanced measurement approach to operational risk is the mandatory implementation of an operational risk management framework of sufficient quality to satisfy the supervisors. Pillar 2 also implies the need for the banks to pass a qualitative review by the national regulator of its operational risk management processes. How will a bank demonstrate to the regulator that its operational risk management framework, processes and systems are of the requisite quality? The regulators are themselves very risk-averse, and so are certain to avoid giving specific advice as to how they might be satisfied in this respect. The regulator's approach will always be: 'show us what you do and we will tell you whether or not we approve'.

Every bank will therefore need to have some kind of framework by which it can demonstrate the quality and maturity of its operational risk management processes. Without such a framework how are the bank and the regulator even going to have the relevant conversation? One of the approaches most likely to fulfil this need is the use of a 'capability maturity model' to produce a self-assessed profile of how well the bank is performing in this respect. These models usually provide a qualitative assessment on a five-point scale. The area of work to be assessed is broken down into a series of 'domains', each of which is resolved into 'process areas', which in turn are further decomposed into 'activities'. An assessment is made on each activity, and these are rolled up to provide aggregated assessments on 'process areas' and 'domains'. The method allows an assessment to be made of where you are now, where you want to get to in a specified time period and also provides the means to track progress against those goals. If offered by a service provider who collects capability maturity data from a number of different banks, then the possibility exists to benchmark each bank against a sanitised average view of specific industry sectors, either by region, by size or by line of business. This will provide the type of framework needed for an individual bank to negotiate its way through the supervisory review of the quality of its risk management processes.

## ***Conclusions***

The implementation of the New Basel Accord raises many important issues, some of which have been outlined above. No doubt there are many more yet to be identified. Many of the larger financial institutions are well under way with their planning and development, but even these firms have much still to do. Those banks that have not yet made significant progress need to begin very soon, since there are many complex issues to be addressed, all of which will require both extensive expertise and considerable investment of time and money. Those that are wise will regard this exercise not just as one of compliance, but as an opportunity to make quantum leaps in improving their risk management, enhancing their shareholder value and their competitive position, and saving on operational costs through streamlining their business processes.

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