19.1.1 Basel II

Basel II is the global risk framework designed to promote stability in the banking sector. It is published and updated by the Basel Committee on Banking Supervision (BCBS), which was established in 1974 by the governors of the central banks of the Group of Ten (G10) countries under the auspices of the Bank for International Settlements (BIS). It has no formal supranational authority and merely recommends statements of best practice. However, these recommendations are taken up not just by regulators in the G10 countries, but also by those in other countries, although the exact implementation can differ substantially from country to country.

Background to Basel II

The BCBS was founded in response to an evident lack of cross-border coordination in financial transactions. It issued guidance throughout the 1970s and 1980s, culminating in 1988, with a set of minimum capital requirements for banks as given by the Basel Committee for Banking Supervision (1988). This was originally known as the 1988 Basel Accord, although when it was superseded it became known as the First Basel Accord, or Basel I. Basel I focuses mainly – and, originally, focussed exclusively – on credit risk. However, as it became clear that the changing nature of banks meant that they were increasingly exposed to market risk, Basel I was updated to allow for this with an amendment as described by the Basel Committee for Banking Supervision (1996). In this context, credit risk can be defined as the risk that funds owed are not paid, and market risk as the risk that the value of assets will move in such a way as to cause a financial loss.

At a high level, the methodology behind Basel I was straightforward. First, credit-related assets and liabilities that were off-balance sheet were converted to on-balance sheet equivalents. These were then risk weighted, together with the existing on-balance sheet credit exposures. Very low risk assets, such as AAA-rated government bonds, had a risk weight of zero, whilst assets which were more risky could have a risk weight of up to 100% of their face value. Exposures to market risk were then adjusted using either a risk-weighting approach (as for credit risk) or a firm's agreed internal model. The model generally involved calculating the risk weight based on a 99% ten-day VaR. These risk-weighted assets were then summed, the total representing the level of risk to which the institution was exposed, and multiplied by a minimum capital

requirement of 8%. This meant that firms had to hold additional capital worth at least 8% of risk-weighted assets.

The available capital was originally classed as either core (tier 1) or supplementary (tier 2) capital. Tier 1 capital consisted of a bank's equity capital and disclosed reserves. Tier 2 capital was made up of undisclosed reserves, revaluation reserves, general loss reserves, hybrid debt instruments and subordinated debt. This capital was generally subject to discounting, upper limits or both. There was a limit on the total amount of tier 2 capital of the amount of tier 1 capital. Essentially, this meant that tier 1 capital of at least 4% of risk-weighted assets was needed. When market risk was added to Basel I, the concept of tier 3 capital also arrived. This made additional allowance for certain types of shorter-dated capital to cover market risk, although again there was a limit on the amount of tier 3 capital that could be used, in this case 250% of the tier 1 capital used to support market risk. Goodwill and unconsolidated banking subsidies were deducted from the sum of these sources of capital, and unconsolidated non-banking subsidies were risk weighted.

As mentioned above, Basel I was simple – but crude. The scope for regulatory arbitrage through methods such as securitisation led to excessive risk being maintained. This process involved packaging loans into instruments such as CDOs, whilst also buying similar products in the market. This could leave a firm's economic exposure to credit risk unchanged, but the credit risk under Basel I would be lower. The risk would instead have been converted to market risk, which could be allowed for in an internal model. This could significantly reduce the amount of capital required.

However, a more important issue was that even with the addition of market risk to the original credit-based formulation, the range of risks considered is still narrow. In particular, some banks ran into difficulties despite appearing healthy from a Basel I point of view. Operational risk – not covered by Basel I – often featured heavily in these cases.

Basel II, the Second Basel Accord, was introduced in 2004. It seeks to address many of the issues with Basel I. Basel II is based on a concept of 'three pillars':

- minimum capital requirements;
- supervisory review process; and
- market discipline.

PILLAR I

Minimum capital requirements

The first pillar is similar to the minimum capital requirement under Basel I in that it uses tiers 1, 2 and 3 capital with only minor changes. It also allows

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for market and credit risk, with market risk being unchanged. In terms of valuation, liquid assets are marked to market (so the market value of assets is used), whereas illiquid assets are marked to model, meaning that the values are 'benchmarked, extrapolated or otherwise calculated from a market input'. As with Basel I, market risk can be calculated using either the risk-weighting approach or an internal model.

Credit risk changes in Basel II. First, the standardised model for credit risk from Basel I is updated to allow for a greater range of creditors. This increased granularity seeks to treat the different credits more equitably. However, Basel II also allows for the use of an internal model in the same way as for market risk, in this case known as the internal ratings based (IRB) approach. This means that, in theory, market and credit risks can be treated consistently. Basel II also makes explicit allowance for securitisation in an effort to limit this aspect of regulatory arbitrage.

Perhaps the greatest change from the first to the second Basel Accord is that an allowance is made for operational risk. In Basel II, operational risk is defined as 'the risk of loss resulting from inadequate or failed internal processes, people and systems or from external events'. Three approaches can be used to calculate the reserves required. The simplest method is the basic indicator approach. This involves applying a fixed multiple, α, to the gross income. The measure of gross income used under Basel II is the average over last three years, with any years for which the gross income is less than or equal to zero being excluded from the calculation. This means that if the gross income is positive for only two of the last three years, the income in these two years should be added together and divided by two rather than three. If the capital required under this approach is K_{BIA}, the approach can be described as:

$$K_{BIA} = \frac{\sum_{t=1}^{3} \max(GI_t, 0)\alpha}{I(GI_t \geq 0)}, \tag{19.1}$$

where GI_t is the gross income in year t and $I(GI_t \geq 0)$ is an indicator function that is equal to one if $GI_t \geq 0$ and zero otherwise.

A more advanced approach is to take a multiple of gross income across each business line. This is the standardised approach. This is similar to the basic indicator approach except that the firm is divided into eight separate business lines with the capital being calculated separately for each. Also, negative gross incomes are not excluded from the calculation. This should make the standardised approach more attractive to banks than the basic indicator approach. If

Table 19.1. *Values of β_n for standardised approach to operational risk under Basel II*

n	Business line	β_n
1	Corporate finance	18%
2	Trading and sales	18%
3	Retail banking	12%
4	Commercial banking	15%
5	Payment and settlement	18%
6	Agency services	15%
7	Asset management	12%
8	Retail brokerage	12%

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

the capital required under this approach is K_{SA}, the approach can be described as:

$$K_{SA} = \frac{\sum_{n=1}^{8} \sum_{t=1}^{3} GI_{n,t} \beta_n}{3}, \tag{19.2}$$

The values of β_n for each business line are given in Table 19.1.

Finally, with the agreement of the regulator, a firm can use internal models and scenario analysis to calculate a bespoke reserve requirement. This is the advanced measurement approach. This involves using internal and external data to determine the probability of loss events and the expected size of loss, given that an event has occurred in each business line. For this approach, each loss event type must be allowed for. The different event types are:

- internal fraud;
- external fraud;
- employment practices and workplace safety;
- clients, products and business practices;
- damage to physical assets;
- business disruption and system failures; and
- execution, delivery and process management.

This approach gives banks the opportunity to model operational losses consistently with market and credit risks.

PILLAR II

Supervisory review

The second pillar of Basel II is supervisory review. This is important as it recognises explicitly that holding capital is not a substitute for inadequate risk management, although the result of the review might be a requirement to hold additional capital against risks not covered in the first pillar. There are a number of aspects to supervisory review. The first is that firms have an internal process for monitoring capital adequacy. This forms the basis for review by the regulator, who needs to make sure that the process is sound. The regulator also needs to ensure that the firm is operating above minimum level, and has an obligation to intervene quickly if there is a risk of capital falling below minimum levels. There are a number of aspects of the process that the regulator must pay particular attention to. Interest rate risk should be considered, as should various aspects of credit risk, including concentration and counter-party risk. The regulator should also verify that the approach used to quantify operational risk is consistent with the business, and whether market risk is correctly measured.

Guidelines in India for Pillar II

2. The Basel II document of the Basel Committee also lays down the following four key principles in regard to the SRP envisaged under Pillar 2:

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

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

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

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

3. It would be seen that the principles 1 and 3 relate to the supervisory expectations from the banks while the principles 2 and 4 deal with the role of the supervisors under Pillar 2. The Pillar 2 (Supervisory Review Process - SRP) requires banks to implement an internal process, called the Internal Capital Adequacy Assessment Process (ICAAP), for assessing their capital adequacy in relation to their risk profiles as well as a strategy for maintaining their capital

levels. The Pillar 2 also requires the supervisory authorities to subject all banks to an evaluation process, hereafter called Supervisory Review and Evaluation Process (SREP), and to initiate such supervisory measures on that basis, as might be considered necessary. An analysis of the foregoing principles indicates that the following broad responsibilities have been cast on the banks and the supervisors:

4. Thus, the ICAAP and SREP are the two important components of Pillar 2 and could be broadly defined as follows:

The ICAAP comprises a bank's procedures and measures designed to ensure the following:

a) An appropriate identification and measurement of risks;
b) An appropriate level of internal capital in relation to the bank's risk profile; and
c) Application and further development of suitable risk management systems in the bank.

The SREP consists of a review and evaluation process adopted by the supervisor, which covers all the processes and measures defined in the principles listed above. Essentially, these include the review and evaluation of the bank's ICAAP, conducting an independent assessment of the bank's risk profile, and if necessary, taking appropriate prudential measures and other supervisory actions.

7. The RBI generally expects banks to hold capital above their minimum regulatory capital levels, commensurate with their individual risk profiles, to account for all material risks. Under the SREP, the RBI will assess the overall capital adequacy of a bank through a comprehensive evaluation that takes into account all relevant available information. In determining the extent to which banks should hold capital in excess of the regulatory minimum, the RBI would take into account the combined implications of a bank's compliance with regulatory minimum capital requirements, the quality and results of a bank's ICAAP, and supervisory assessment of the bank's risk management processes, control systems and other relevant information relating to the bank's risk profile and capital position.

9. Under the SREP, the RBI would also seek to determine whether a bank's overall capital remains adequate as the underlying conditions change. Generally, material increases in risk that are not otherwise mitigated should be accompanied by commensurate increases in capital. Conversely, reductions in overall capital (to a level still above regulatory minima) may be appropriate if the RBI's supervisory assessment leads it to a conclusion that risk has materially declined or that it has been appropriately mitigated. Based on such an assessment, the RBI could consider initiating appropriate supervisory measures to address its supervisory concerns. The measures could include requiring a modification or enhancement of the risk management and internal control processes of a bank, a reduction in risk exposures, or any other action as deemed necessary to address the identified supervisory concerns. These measures could also include the stipulation of a bank-specific minimum CRAR that could potentially be even higher, if so warranted by the facts and circumstances, than the regulatory minimum stipulated under the Pillar 1. In cases where the RBI decides to stipulate a CRAR at a level higher than the regulatory minimum, it would explain the rationale for doing so, to the bank concerned. However, such an add-on CRAR stipulation, though possible, is not expected to be an automatic or inevitable outcome of the SREP exercise, the prime objective being improvement in the risk management systems of the banks.

11.6.1 In relation to a bank that defines its activities and risk management practices as **simple**, in carrying out its ICAAP, that bank could:

a) identify and consider that bank's largest losses over the last 3 to 5 years and whether those losses are likely to recur;

b) prepare a short list of the most significant risks to which that bank is exposed;

c) consider how that bank would act, and the amount of capital that would be absorbed in the event that each of the risks identified were to materialise;

d) consider how that bank's capital requirement might alter under the scenarios in (c) and how its capital requirement might alter in line with its business plans for the next 3 to 5 years; and

e) document the ranges of capital required in the scenarios identified above and form an overall view on the amount and quality of capital which that bank should hold, ensuring that its senior management is involved in arriving at that view.

11.6.2 In relation to a bank that define its activities and risk management practices as **moderately complex**, in carrying out its ICAAP, that bank could:

a) having consulted the operational management in each major business line, prepare a comprehensive list of the major risks to which the business is exposed;

b) estimate, with the aid of historical data, where available, the range and distribution of possible losses which might arise from each of those risks and consider using shock stress tests to provide risk estimates;

c) consider the extent to which that bank's capital requirement adequately captures the risks identified in (a) and (b) above;

d) for areas in which the capital requirement is either inadequate or does not address a risk, estimate the additional capital needed to protect that bank and its customers, in addition to any other risk mitigation action that bank plans to take;

e) consider the risk that the bank's own analyses of capital adequacy may be inaccurate and that it may suffer from management weaknesses which affect the effectiveness of its risk management and mitigation;

f) project that bank's business activities forward in detail for one year and in less detail for the next 3 to 5 years, and estimate how that bank's capital and capital requirement would alter, assuming that business develops as expected;

g) assume that business does not develop as expected and consider how that bank's capital and capital requirement would alter and what that bank's reaction to a range of adverse economic scenarios might be;

h) document the results obtained from the analyses in (b), (d), (f), and (g) above in a detailed report for that bank's top management / board of directors; and

i) ensure that systems and processes are in place to review the accuracy of the estimates made in (b), (d), (f) and (g) (i.e., systems for back testing) vis-à-vis the performance / actuals.

11.6.3 In relation to a bank that define its activities and risk management practices as **complex**, in carrying out its ICAAP, that bank could follow a proportional approach to that bank's ICAAP which should cover the issues identified at (a) to (d) in paragraph 11.6.2 above, but is likely also to involve the use of models, most of which will be integrated into its day-to-day management and operations.

Models of the kind referred to above may be linked so as to generate an overall estimate of the amount of capital that a bank considers appropriate to hold for its business needs. A bank may also link such models to generate information on the economic capital considered desirable for that bank. A model which a bank uses to generate its target amount of economic capital is known as an economic capital model (ECM). Economic capital is the target amount of capital which optimises the return for a bank's stakeholders for a desired level of risk. For example, a bank is likely to use value-at-risk (VaR) models for market risk, advanced modelling approaches for credit risk and, possibly, advanced measurement approaches for operational risk. A bank might also use economic scenario generators to model stochastically its business forecasts and risks. However, the advanced approaches envisaged in the Basel II Framework are not currently permitted by the RBI and the banks would need prior approval of the RBI for migrating to the advanced approaches.

Such a bank is also likely to be part of a group and to be operating internationally. There is likely to be centralised control over the models used throughout the group, the assumptions made and their overall calibration.

Identifying and measuring material risks in ICAAP

12.1 The first objective of an ICAAP is to identify all material risks. Risks that can be reliably measured and quantified should be treated as rigorously as data and methods allow. The appropriate means and methods to measure and quantify those material risks are likely to vary across banks.

12.2 Some of the risks to which banks are exposed include credit risk, market risk, operational risk, interest rate risk in the banking book, credit concentration risk and liquidity risk (as briefly outlined below). The RBI has issued guidelines to the banks on asset liability management, management of country risk, credit risk, operational risk, etc., from time to time. A bank's risk management processes, including its **ICAAP, should, therefore, be consistent with this existing body of guidance**. However, certain other risks, such as reputational risk and business or strategic risk, may be equally important for a bank and, in such cases, should be given same consideration as the more formally defined risk types. For example, a bank may be engaged in businesses for which periodic fluctuations in activity levels, combined with relatively high fixed costs, have the potential to create unanticipated losses that must be supported by adequate capital. Additionally, a bank might be involved in strategic activities (such as expanding business lines or engaging in acquisitions) that introduce significant elements of risk and for which additional capital would be appropriate.

Additionally, if banks employ risk mitigation techniques, they should understand the risk to be mitigated and the potential effects of that mitigation, reckoning its enforceability and effectiveness, on the risk profile of the bank.

12.3 **Credit risk**: A bank should have the ability to assess credit risk at the portfolio level as well as at the exposure or counterparty level. Banks should be particularly attentive to identifying credit risk concentrations and ensuring that their effects are adequately assessed. This should include consideration of various types of dependence among exposures, incorporating the credit risk effects of extreme outcomes, stress events, and shocks to the assumptions made about the portfolio and exposure behavior. Banks should also carefully assess concentrations in counterparty credit exposures, including counterparty credit risk exposures emanating from trading in less liquid markets, and determine the effect that these might have on the bank's capital adequacy.

12.4 **Market risk**: A bank should be able to identify risks in trading activities resulting from a movement in market prices. This determination should consider factors such as illiquidity of instruments, concentrated positions, one-way markets, non-linear/deep out-of-the money positions, and the potential for significant shifts in correlations. Exercises that incorporate extreme events and shocks should also be tailored to capture key portfolio vulnerabilities to the relevant market developments.

12.5 **Operational risk**: A bank should be able to assess the potential risks resulting from inadequate or failed internal processes, people, and systems, as well as from events external to the bank. This assessment should include the effects of extreme events and shocks relating to operational risk. Events could include a sudden increase in failed processes across business units or a significant incidence of failed internal controls.

12.6 **Interest rate risk in the banking book** (IRRBB): A bank should identify the risks associated with the changing interest rates on its on-balance sheet and off-balance sheet exposures in the banking book from both, a short-term and long-term perspective. This might include the impact of changes due to parallel shocks, yield curve twists, yield curve inversions, changes in the relationships of rates (basis risk), and other relevant scenarios. The bank should be able to support its assumptions about the behavioral characteristics of its non-maturity deposits and other assets and liabilities, especially those exposures characterised by embedded optionality. Given the uncertainty in such assumptions, stress testing and scenario analysis should be used in the analysis of interest rate risks. While there could be several approaches to measurement of IRRBB, an **illustrative** approach for measurement of IRRBB is furnished at **Appendix 1**. The banks would, however, be free to adopt any other variant of these approaches or entirely different methodology for computing / quantifying the IRRBB

12.7 **Credit concentration risk**: A risk concentration is any single exposure or a group of exposures with the potential to produce losses large enough (relative to a bank's capital, total assets, or overall risk level) to threaten a bank's health or ability to maintain its core operations. Risk concentrations have arguably been the single most important cause of major problems in banks. Concentration risk resulting from concentrated portfolios could be significant for most of the banks.

The following **qualitative criteria** could be adopted by the banks to demonstrate that the credit concentration risk is being adequately addressed:

a) While assessing the exposure to concentration risk, a bank should keep in view that the calculations of Basel II framework are based on the assumption that a bank is well diversified.

b) While the banks' single borrower exposures, the group borrower exposures and capital market exposures are regulated by the exposure norms prescribed by the RBI, there could be concentrations in these portfolios as well. In assessing the degree of credit concentration, therefore, a bank shall consider not only the foregoing exposures but also consider the degree of credit concentration in a particular economic sector or geographical area. The banks with operational concentration in a few geographical regions, by virtue of the pattern of their branch network, shall also consider the impact of adverse economic developments in that region, and their impact on the asset quality.

c) The performance of specialised portfolios may, in some instances, also depend on key individuals / employees of the bank. Such a situation could exacerbate the concentration risk because the skills of those individuals, in part, limit the risk arising from a concentrated portfolio. The impact of such key employees / individuals on the concentration risk is likely to be correspondingly greater in smaller banks. In developing its stress tests and scenario analyses, a bank shall, therefore, also consider the impact of losing key personnel on its ability to operate normally, as well as the direct impact on its revenues.

As regards the **quantitative criteria** to be used to ensure that credit concentration risk is being adequately addressed, the credit concentration risk calculations shall be performed at the counterparty level (i.e., large exposures), at the portfolio level (i.e., sectoral and geographical concentrations) and at the asset class level (i.e., liability and assets concentrations). In this regard, a reference is invited to paragraph 3.2.2 (c) of the Annex to our Circular DBOD.No.BP.(SC).BC.98/ 21.04.103/ 99 dated October 7, 1999 regarding Risk Management System in Banks in terms of which certain prudential limits have been stipulated in regard to 'substantial exposures' of banks. As a prudent practice, the banks may like to ensure that their aggregate exposure (including non-funded exposures) to all 'large borrowers' does not exceed at any time, 800 per cent of their 'capital funds' (as defined for the purpose of extant exposure norms of the RBI). The 'large borrower' for this purpose could be taken to mean as one to whom the bank's aggregate exposure (funded as well as non-funded) exceeds 10 per cent of the bank's capital funds. The banks would also be well advised to pay special attention to their

industry-wise exposures where their exposure to a particular industry exceeds 10 per cent of their aggregate credit exposure (including investment exposure) to the industrial sector as a whole.

There could be several approaches to the measurement of credit concentration the banks' portfolio. One of the approaches commonly used for the purpose involves computation of Herfindahl-Hirshman Index (HHI). It may please be noted that the HHI as a measure of concentration risk is only one of the possible methods and the banks would be free to adopt any other appropriate method for the purpose, which has objective and transparent criteria for such measurement.

12.8 **Liquidity risk**: A bank should understand the risks resulting from its inability to meet its obligations as they come due, because of difficulty in liquidating assets (market liquidity risk) or in obtaining adequate funding (funding liquidity risk). This assessment should include analysis of sources and uses of funds, an understanding of the funding markets in which the bank operates, and an assessment of the efficacy of a contingency funding plan for events that could arise.

12.9 The risk factors discussed above should not be considered an exhaustive list of those affecting any given bank. All relevant factors that present a material source of risk to capital should be incorporated in a well-developed ICAAP. Furthermore, banks should be mindful of the capital adequacy effects of concentrations that may arise within each risk type.

Quantitative and qualitative approaches in ICAAP

12.10 All measurements of risk incorporate both quantitative and qualitative elements, but to the extent possible, a quantitative approach should form the foundation of a bank's measurement framework. In some cases, quantitative tools can include the use of large historical databases; when data are more scarce, a bank may choose to rely more heavily on the use of stress testing and scenario analyses. Banks should understand when measuring risks that measurement error always exists, and in many cases the error is itself difficult to quantify. In general, an increase in uncertainty related to modeling and business complexity should result in a larger capital cushion.

12.11 Quantitative approaches that focus on most likely outcomes for budgeting, forecasting, or performance measurement purposes may not be fully applicable for capital adequacy because the ICAAP should also take less likely events into account. Stress testing and scenario analysis can be effective in gauging the consequences of outcomes that are unlikely but would have a considerable impact on safety and soundness.

12.12 To the extent that risks cannot be reliably measured with quantitative tools – for example, where measurements of risk are based on scarce data or unproven quantitative methods – qualitative tools, including experience and judgment, may be more heavily utilised. Banks should be cognisant that qualitative approaches have their own inherent biases and assumptions that affect risk assessment; accordingly, banks should recognise the biases and assumptions embedded in, and the limitations of, the qualitative approaches used.

Risk aggregation and diversification effects

12.13 An effective ICAAP should assess the risks across the entire bank. A bank choosing to conduct risk aggregation among various risk types or business lines should understand the challenges in such aggregation. In addition, when aggregating risks, banks should be ensure that any potential concentrations across more than one risk dimension are addressed, recognising that losses could arise in several risk dimensions at the same time, stemming from the same event or a common set of factors. For example, a localised natural disaster could generate losses from credit, market, and operational risks at the same time.

12.14 In considering the possible effects of diversification, management should be systematic and rigorous in documenting decisions, and in identifying assumptions used in each level of risk aggregation. Assumptions about diversification should be supported by analysis and evidence. The bank should have systems capable of aggregating risks based on the bank's selected framework. For example, a bank calculating correlations within or among risk types should consider data quality and consistency, and the volatility of correlations over time and under stressed market conditions.

PILLAR III

Market discipline

Market discipline is the third pillar of Basel II. This is essentially a case of promoting transparency by requiring firms to publish details of their risks, their capital and the ways in which they manage risk. The aim is to make sure that sufficient information about a firm is disclosed for the market to assess the risks faced by the firm, and for the cost of capital – the price of equity and debt – to be adjusted accordingly. The rationale behind this is that a firm will seek to manage risks in order to manage the cost of capital.

Criticisms of Basel II

Criticisms of Basel II

The Second Basel Accord is a major improvement on the First both in scope and in process. However, it still has a number of flaws.

Both Basel Accords focus on a single number as a measure of all risks. In one sense, this is helpful as it allows a variety of different firms to be compared on a consistent basis. However, the range of firms described by this figure and the range of risks aggregated into it mean that is dangerous to place too much emphasis on a single measure of risk such as this. In fact, the headline figure is arguably even less informative for Basel II than for Basel I, since the range of risks covered by the former is much greater than that covered by the latter.

A major improvement is the allowance for operational risk. However, the list or risks addressed remains incomplete. Importantly, liquidity risk is given only cursory treatment, although in 2009 the Basel Committee on Banking Supervision did issue proposals to allow for this risk more fully.

It is worth noting the difficulty in arriving at a firm estimate for the risk number. First, it is difficult to quantify many operational risks. However, quantification is not straightforward even for market risks: the level of confidence required is one in two hundred years, but some of the asset classes considered have existed for only a decade. In this context, the levels of confidence could be regarded as spurious.

However, despite the potentially reduced reliability of this number, there is a risk that the more risks included and the more complex the calculations become, the greater the confidence that will be put in the risk number. This equation of complexity with reliability is dangerous.

Basel II is also blamed for elements of pro-cyclicality in market cycles, leading to feedback risk. In particular, marking assets to market or even to model (which requires valuation using market inputs) requires risky assets to be sold if their market value has fallen. This forced sale can force asset prices down further. Pro-cyclicality is cited as a reason to avoid marking assets to market. However, it is not clear what alternative could be used – anything that does not reflect market values risks over-valuing assets held by a bank. Having said this, market values can seriously under-value certain fixed interest instruments where the risk of loss is slight – the question is, by how much.

Linked to the issue of pro-cyclicality is the failure of Basel II to deal with systemic risks. Basel II aims to control the risk of insolvency of each bank. However, this only serves to control the overall risk of the banking system if the risks of insolvency are reasonably uncorrelated across banks. Because banks are often similarly exposed to many risks, this means that an adverse event affecting one bank could actually affect many.

A final, practical issue with Basel II is that the added complications relative to Basel I require added expenditure on appropriate systems. It is not clear that this expenditure will improve outcomes for all companies.

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