The current status of banks' internal risk management and the assessment of capital adequacy under the Supervisory Review Process

Recent financial market events once again illustrate how essential it is to apply modern, quantitative risk measurement and management methods in banks' internal control processes. Requirements to this effect have already been established by the revised "International Convergence of Capital Measurements and Capital Standards" framework, known as "Basel II". Besides the more risk-sensitive regulatory minimum capital requirements of Pillar 1, the rules under Pillar 2 require banks to have an internal risk and capital management system, known as the "Internal Capital Adequacy Assessment Process" (ICAAP), which is adapted to an institution's specific risk profile. German supervisors have conducted a study on the status of the implementation of the ICAAP, which banks have to have in place by the beginning of 2008. The study found that the banks in Germany are on the right track to implement the ICAAP properly; the degree of implementation varies, however. At this juncture, it is impossible to judge conclusively how adequately the financial market turbulence in the second half of this year has been mapped to banks' models. However, since the evolution process of internal risk management and thus of the ICAAP is dynamic, the banks' task is to take adequate account of their experiences when developing and adapting their models.

Introduction

In their evaluation of the Internal Capital Adequacy Assessment Process (ICAAP), German supervisors will start with banks' real-world practice, especially in order to monitor and assess new developments as they occur. To this end, in early 2007, supervisors conducted a survey on individual banks' internal control systems.

Survey on the ICAAP

The study covered the "internal capital concept", the "calculation of economic capital" and "risk management using economic capital". Nearly all of the major, internationally active banks as well as several smaller and medium-sized institutions took part on a voluntary basis.[1] All of the statements in this article refer only to the institutions surveyed for this study.

The supervisory framework for the ICAAP, the methodological foundations of economic capital models and the results of this survey will be presented in this article. The details given will provide an overview of the developmental state of German credit institutions' methods for safeguarding risk-bearing capacity and draw preliminary supervisory conclusions.

Supervisory framework

The requirements of Pillar 2 of the Basel II revised supervisory framework and their transposition into European law are codified at the national level in the German Banking Act (*Kreditwesengesetz*). Pursuant to section 25a (1) of the Banking Act, credit institutions are required to establish procedures to calculate and safeguard their risk-bearing capacity and to manage their risks. These requirements, which are not specified more precisely in the Banking Act, are given concrete shape in the "Minimum requirements for risk management" (*Mindestanforderungen an das Risikomanagement,* or *MaRisk*).[2]

One key component of the MaRisk is the ICAAP, which sets standards on banks' internal systems to ensure that their risk-bearing capacity is maintained on a sustainable basis. Alongside the ICAAP, Pillar 2 formulates principles for the review and evaluation of these processes by banking supervisors (Supervisory Review and Evaluation Process, or SREP). The ICAAP and the SREP together form the Supervisory Review Process (SRP).

Risk-bearing capacity

Risk and capital are two key elements of a bank's internal control system which are compared with one another when determining a bank's risk-bearing capacity. Risk-bearing capacity means that, on the basis of an overall risk profile, it must be ensured that all of a bank's key risks, including as appropriate the interaction between individual risks, are continuously backed by the capital held to cover potential losses. To this end, it is necessary to

1 Measured in terms of the institutions' balance sheet totals, the survey covered nearly 55% of the total domestic banking system.
2 BaFin circular 5/2007: Minimum requirements for risk management, as published on 30 October 2007 (available only in German). Where possible, this article uses terminology based on the translation of the 2005 version of the MaRisk: see http://www.bafin.de/rundschreiben/89_2005/051220_en.htm.

quantify the risks over a given period of time, also known as the risk horizon.

Risk-taking potential

The capital which is the subject of a risk-bearing capacity concept and is available to cover potential losses is called "risk-taking potential". Unlike the concept of regulatory capital, the elements of the risk-taking potential are not governed by any explicit supervisory provisions.

Economic capital requirement

The economic capital requirement is the result of the quantification of risk across all key types of risk. According to the MaRisk, the following types of risk should generally be included in the analysis of the overall risk profile: counterparty risk including country risk, market risk, and operational risk. Taking these and all other relevant types of risk into account, an institution must determine which risks are key to its specific business profile and must always calculate an economic capital requirement for each of them. If an institution does not include key risks in the economic capital requirement calculation, it must provide a comprehensible explanation for not doing so. These risks, however, must then be properly factored into the risk management and control processes.

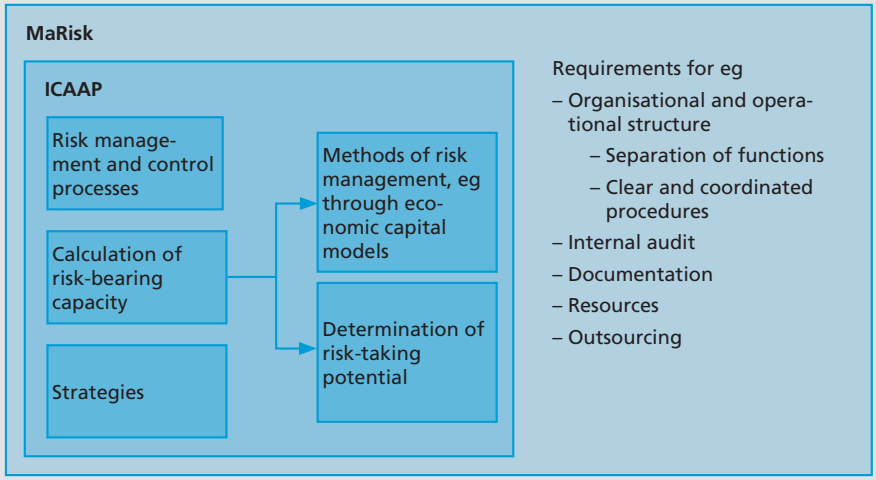
There are no supervisory rules governing the choice of procedure to determine the economic capital requirement; however, such a procedure should properly reflect a bank's individual situation. The most advanced banks use complex mathematical models which are described in the literature as "economic capital models". The chart on page 60 shows the relationship between the MaRisk, the ICAAP and economic capital models.

Foundations of economic capital models

Banks are increasingly modelling the probability distribution of potential losses at an overall bank level in order to measure their risks. In this process, each bank individually defines which amount of losses that will be incurred with a given probability (confidence level) it wishes to cover with available capital and for which generally very high but improbable losses it will run the risk of itself becoming insolvent.

Standard measures of risk and therefore of the economic capital requirement are value at risk (VaR) and expected shortfall (ES). VaR is a quantile of the loss distribution and thus denotes the loss amount that will not be exceeded with a given probability. ES is the expected value of all losses greater than this quantile. To calculate the economic capital requirement, the expected value of the loss distribution is deducted from both measures since, as "average costs" of banking operations, it does not represent a risk in the sense of an uncertainty and should be covered by margin income. The chart on page 61 illustrates the relationship between the aforementioned concepts. The quantile used to determine VaR is generally derived from the bank's target external rating or from the supervisory provisions for Pillar 1 minimum capital ratios (99.9% for credit risk and operational risk and 99% for market risk).

Relationship between the minimum requirements for risk management (MaRisk), ICAAP* and economic capital models**



* In the Internal Capital Adequacy Assessment Process (ICAAP), banks' internal processes are required to meet certain standards in order to ensure sustainable risk-bearing capacity. — ** Economic capital models are mathematical-statistical methods of measuring risk at the overall bank level.

Deutsche Bundesbank

Limitations of risk measurement

The models to determine the economic capital requirement are typically calibrated on the basis of historical data and experience. This can lead to situations in which the model is unable to accurately map individual risks owing to an unprecedented market disruption. Users of these models need to be aware of these limitations. One possible way to quantify such model risk is by performing stress tests. In addition, a sound risk management approach should also be based on additional information and analyses.

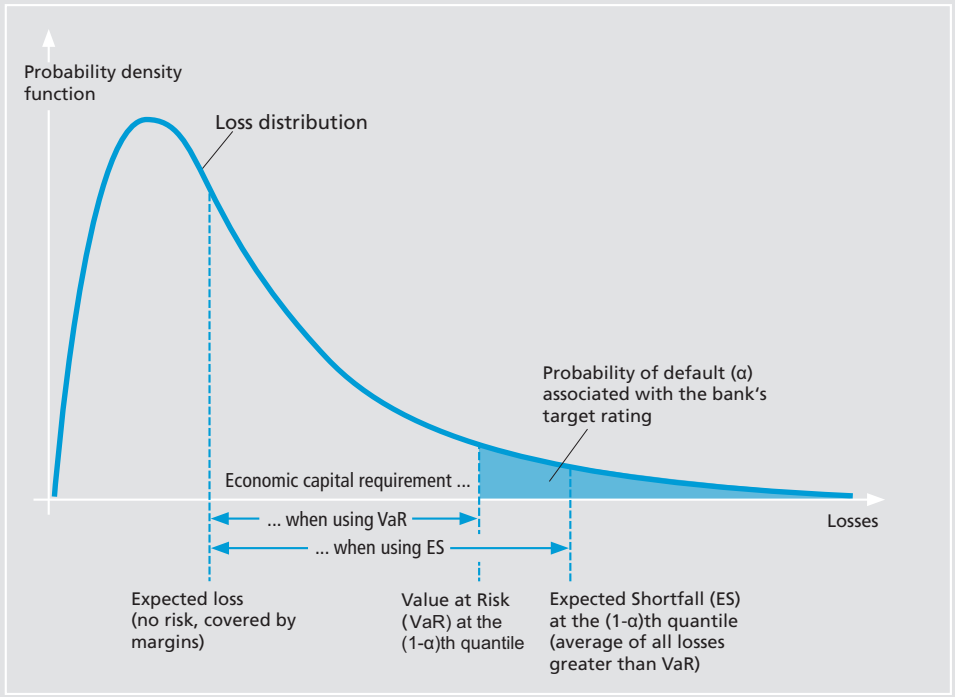
Internal definitions of risk-taking potential

Internal capital concept

There are wide disparities in how risk-taking potential is defined in banking practice, with banks regarding very different capital components as risk-absorbing in the case of severe losses. Some banks use adjusted common equity (ACE) as risk-taking potential. This comprises balance sheet capital minus unrealised gains from securities and potential dividend payments, and is defined much more narrowly than regulatory capital. Banks that use the ACE methodology are often active capital market participants, for which the external rating is important. For that reason, they attach particular importance to consistency between their internal risk management framework and the requirements imposed by rating agencies.

Other banks take into account capital components which go beyond the definition of regulatory capital. For instance, some banks

Risk measures



Deutsche Bundesbank

also regard an individually defined percentage of sustainable projected profits across the considered risk horizon as risk-covering. The reason given for this approach is that losses that occur are initially cushioned by projected profits. The fact that projected profits are preliminary estimates and do not yet represent actually available capital is regarded by the banks as tolerable for internal control purposes. Whether or not this approach is appropriate is initially unclear, since, for instance, a severe loss could occur at the beginning of the planning period, whereas profits accumulate only gradually across the period.

Stages of risk-taking potential

Around half of the banks surveyed define several stages of risk-taking potential in which the balance sheet items serving as risk buffers are arranged in order of their ability to absorb losses and the capital available in the individual stages of the risk cover fund is compared with differing loss levels of the economic capital requirement. The economic capital requirement can thus be calculated not just for a liquidation situation but also from a going concern perspective.

From the going concern perspective, the bank is assumed to continue to operate; the economic capital requirement is calculated at a much lower confidence level and the projected profit forms a key component of the risk cover fund. For instance, a comparison of projected profits with the VaR at an 80% confidence level concludes that the bank, with its current risk profile, will lose all of its projected profits on average every five years. Whereas, in this case, the interests of the

owners or investors and employees are at the fore, the liquidation perspective is mainly of interest to lenders.

Risks covered in the ICAAP

Key types of risk

All respondent institutions listed credit risk, market risk including interest rate risk in the banking book and operational risk as key types of risk.

Further risks which only some banks regard as key risks are business risk (eg the risk that income will fall sharply because certain products are no longer in demand), equity risk, real estate risk and insurance risk. In some cases, there is a dearth of suitable methods of quantifying these types of risk, which means that the relevant capital requirement is determined only as a pre-determined part of the risk-taking potential. In the case of smaller banks, in particular, it is observed that the types of risk classified as key risks often comprise only credit risk, market risk and operational risk, and that supervisory risk measurement methods are also deployed internally to measure these risks. The chart on page 63 shows the most important types of risk and their share in the banks' overall risk profile.

One type of risk classified as material by several of the banks surveyed is market liquidity risk.[3] However, no economic capital is held to cover this risk since a shortage of market liquidity cannot be offset by increased capital. Instead, market liquidity risks are monitored by means of a process that is independent of economic capital management.

Moreover, some banks explicitly model refinancing liquidity risk – ie the risk that, for instance, a rating downgrade will leave them with only more expensive refinancing options to choose from – and cover this risk with economic capital.

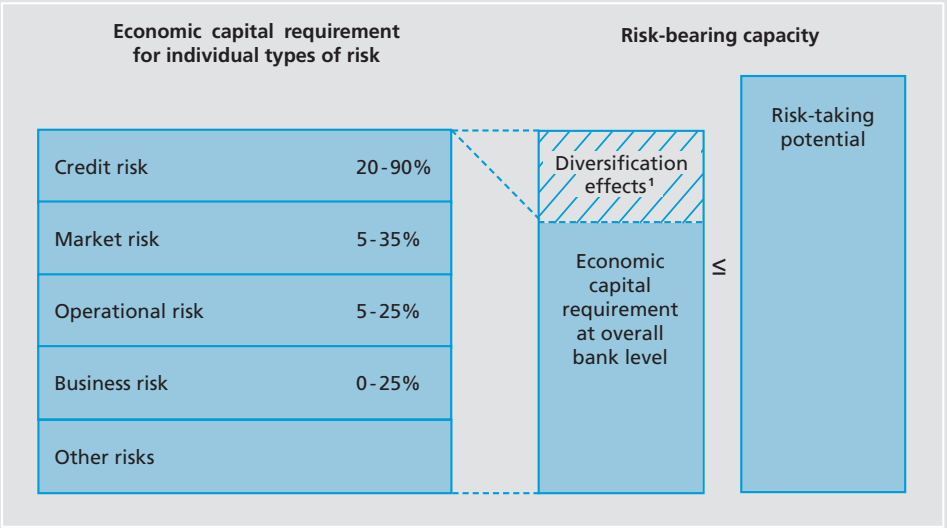
Credit, concentration and equity risk

For most banks, credit risk represents by far the largest driver of overall risk. To measure credit risk, larger banks predominantly use credit risk models, which incorporate not only the credit ratings of the individual borrowers but also interdependence between borrowers, measured by correlations.[4] In order to calculate their capital requirement, nearly all of these institutions consider their VaR at the confidence level, which can be derived from the external rating targeted by the bank; only one institution uses ES as a measure. One important reason for implementing credit risk models is that the credit portfolios contain risk concentrations with regard to individual borrowers, sectors or regions which are not reflected in the Pillar 1 supervisory measurement approaches. Credit risk models implicitly allocate more capital to loans in concentrated segments via the correlations used in the model; an institution that does not have a model must manage its risk concentrations through other risk management devices, such as limits on lending to certain sectors.

3 Normally, the large institutions make a distinction in liquidity risk between market liquidity risk and refinancing risk.

4 Most institutions' models have been developed by third-party providers; most proprietary solutions are similarly based on these external providers' methods. Prototypical third-party solutions include "PortfolioManager" by Moody's KMV, "CreditMetrics" by JP Morgan and "CreditRisk+" by Credit Suisse; some other less commonly used models also exist. For a detailed description of the models, see Bluhm, Overbeck and Wagner, An Introduction to Credit Risk Modelling, CRC Press, 2002.

Types of risks as a percentage of total economic capital requirement and assessment of risk-bearing capacity*



* This assessment is not based on a representative sample of the German banking market but is instead based on information from a project in which selected institutions were surveyed. — 1 Some institutions make allowance for diversification effects when aggregating the individual types of risk. In the observed cases here, this reduces the economic capital requirement by up to 20%.

Deutsche Bundesbank

Those banks that do not use a credit risk model calculate the capital requirement for credit risk according to the supervisory provisions for minimum capital requirements pursuant to the German Solvency Regulation (*Solvabilitätsverordnung*). The larger of these banks use the Internal Ratings-Based (IRB) Approach; however, the input parameters sometimes differ from the standards set by supervisors. In many cases, there are plans to introduce a credit risk model in the foreseeable future. Some smaller banks also internally use the less risk-sensitive risk weights of the Standardised Approach.

Equity risk is, in some cases, factored into market risk by institutions. Where this is not possible, equity risk is modelled separately. To this end, the capital requirement is often calculated on the basis of the market values of equity holdings and their volatilities and a capital factor is determined. An alternative approach is to capture equity risk in a manner similar to credit risk, but to adjust the definition of default and the imputed loss given default (LGD).

Market risk including interest rate risk

Nearly all large, internationally active banks use their own models to calculate the economic capital requirement for market risk including interest rate risk in the banking book.

One of the banks surveyed calculates the economic capital for market risk on the basis of a simulation of stress scenarios over a one-year horizon. All of the other banks in the survey calculate market risk as VaR largely over a one-day or ten-day period and a confidence

level of mostly 95% or 99%. For the purposes of risk aggregation, most institutions then scale this value up to a one-year horizon and the appropriate confidence level for an evaluation of overall risk. This approach is regarded by some banks as too conservative as it implicitly assumes that the portfolio is held constant for one year and is not actively managed. They therefore scale the market risk VaR to the time period that they believe is necessary to liquidate their portfolio. In their view, the VaR calculated in this manner corresponds to the risk over a one-year horizon, since the portfolio contains no more risk following a hypothetical liquidation. Supervisors will, in individual cases, analyse the extent to which this assertion will hold water under real-life conditions.

Operational risk

In contrast to the many years of experience which banks have with regard to quantitative methods of measuring market and credit risk, the modelling of operational risk is still a relatively new phenomenon. It received a key impetus from the regulatory capital requirements contained in Basel II, for the calculation of which banks, under certain circumstances, are allowed to use their own internal models. Standards for operational risk models are only slowly beginning to evolve.

One of the problems that banks face in the development of their own models is the lack of available loss data. Unlike, for instance, market risk, which is determined by the risk characteristics of the traded financial instruments, operational risk is determined to a greater extent by institution-specific features, such as internal processes. In order to make their estimates more reliable, institutions are expanding their database of loss time series by adding historical third-party data.

Just like in the case of credit risk, several larger banks and most small banks also use the simpler approaches for regulatory minimum capital requirements pursuant to the Solvency Regulation (Basic Indicator Approach or Standardised Approach) for their internal risk management of operational risk. However, to what extent the resultant risk figures, which are not explicitly calibrated to a given confidence level, are compatible with the confidence level of the bank's target rating for overall bank management purposes should be explained more clearly by the banks.

Business risk and other types of risk

At present, only a few banks take account of business risk in their economic capital models. Business risk is typically determined by means of scenario analyses using expert knowledge and historical data on revenue and cost fluctuations.

Depending on their business orientation, banks incorporate further types of risk into their economic capital model. Such risks may include real estate risk, collective risk in the case of building and loan associations or insurance risk.

A risk that only a few banks have hitherto taken into account is model uncertainty. This uncertainty arises from simplistic model assumptions, erroneous input data and estimates or simplified calculation procedures, such as when scaling the confidence level

and the time horizon. Where such model risks are taken into account, this is done indirectly, eg by using conservative estimates.

On the whole, the methods of calculating the economic capital requirement for business risk and other types of risk are less advanced than those used to calculate market risk, credit risk and operational risk. One reason may be that the Solvency Regulation does not impose any regulatory capital charges for these types of risk. However, it is only within the past few years that they have come into the focus of banks' internal practices.

Diversification between risk types

The interdependence between types of risk is typically measured through correlations. German banks currently use a variety of methods to calculate the resultant diversification effects. The approach chosen by most institutions is to add up the economic capital requirement for each of the individual risk types. From the banks' perspective, the underlying assumption of a 100% correlation represents a conservative assessment of risk.

Where diversification effects are explicitly factored in – which is currently the case only for a few large, internationally active banks – the calculated economic capital requirement is reduced (by up to 20% compared with the figure obtained through the simple addition of types of risk). In doing so, it must be taken into account that, owing to short or qualitatively inadequate data series, the correlations are often based on expert opinions and the capital reduction therefore involves a significant estimation risk. Diversification effects between certain types of risk, such as market risk or credit risk, are better suited to quantitative modelling than, for instance, correlations between market risk and operational risk.

Economic capital concepts: integrating economic capital into overall bank management

Economic capital concepts describe how economic capital is integrated into operational risk management. The degree of integration varies from one bank to another. Particularly among major, internationally active banks, economic capital concepts are already at a very advanced stage. The chart on page 66 shows the typical process of integration.

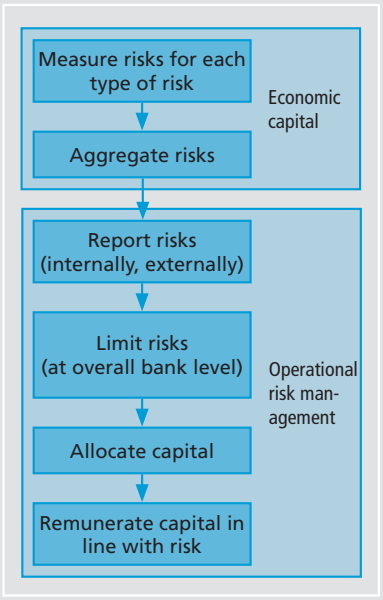
Internal reporting

All of the banks surveyed use economic capital figures for their internal management information systems: the board of directors, the risk committee and similar groupings regularly receive information, usually monthly or quarterly, on current capital adequacy and the capital requirement. They can thus check to what extent the measured risk matches the desired risk profile and is consistent with the risk strategy. Many banks also factor these figures into their strategic considerations.

Limit systems

Limit systems based on economic capital at the overall bank level are another approach applied widely by the institutions surveyed. In this approach, the bank's senior management decides what proportion of the risk cover fund should be placed "in the risk", ie deployed to cover the economic capital requirement.

Typical process of integrating economic capital into operational risk management



Deutsche Bundesbank

Some of the large, internationally active banks and the vast majority of the smaller and medium-sized institutions surveyed set aside a capital buffer equivalent to the regulatory minimum capital requirements and then allocate only that part of the capital that is left over within the scope of relevant limits. The vast majority of big banks, however, derive their institution-wide limit systems directly from the available risk-taking potential and the amount of quantified risks without having such an additional capital buffer.

A few larger banks determine the proportion of the risk cover fund available to cover the economic capital requirement by drawing comparisons with other banks (eg by evaluating annual report figures) and benchmarking their figures against other banks' percentage use of their risk cover fund. However, the adequacy of such benchmarking practices should be subject to critical scrutiny in specific cases.

Dual control

In banks' risk management, two types of risk measurement systems exist in parallel: for the regulatory minimum capital requirements, the risk assets determined according to supervisory provisions are compared with regulatory capital while, for the ICAAP, banks compare their internally measured risks with their internally defined risk cover fund. The regulatory capital adequacy and regulatory capital requirements are, in many cases, tough additional conditions for banks' internal risk management regimes since the Pillar 1 rules often lead to a greater capital requirement than would be necessary from the banks' internal point of view. From an internal perspective, there is therefore often a capital buffer – not always explicitly envisaged – in the ratio of the risk cover fund to the internally calculated economic capital requirement.

Allocation of capital

Operational risk management stimuli are created not only through the use of institution-wide limits but also largely by allocating the limits to individual business lines, regions, types of risk and portfolios: areas that have not reached their limits can generate new business.

However, the allocation of the institution-wide limit to individual portfolios is generally not additive owing to the diversification effects both within and between the types of risk, which presents institutions with problems. Therefore, with the exception of a few

advanced banks that have solved the problem by means of complex methods, the majority of banks use simplified capital allocation mechanisms. In some cases, capital is divided up in accordance with the correlation between individual subportfolios and overall risk (which does not exactly match the economically accurate risk contributions) or is distributed according to keys, which are not necessarily correlated with risk indicators, such as the return on individual portfolios.

Some of the large banks and many smaller banks are thus currently not able to correctly distribute their overall limit to lower tiers from a methodological perspective. With these banks, it is questionable to what extent economic capital provides stimuli for operational risk management since individual business lines cannot yet be deliberately grown or shrunk by resetting the limits accordingly.

Internal expectations about future returns

Ultimately, business management is more than merely setting limits for business lines up to which a maximum volume of new business can be generated. It is often also important for a bank to know whether new business below the limits set generates an adequate return on the capital necessary for the business.

At present, only a few banks apply economic capital-based return considerations systematically. For one thing, their use is predicated on the existence of the above-mentioned capital allocation mechanisms, which not all banks have implemented yet. In addition, many banks see the regulatory capital requirement rather than the economic capital requirement as a scarce resource and want to tie their expectations for future returns to regulatory capital. Ultimately, however, many banks are in a transitional phase, in which they are gradually moving away from exclusively using traditional measures of return, such as the return on equity (RoE) and the return on regulatory capital, to also incorporate more complex indicators, such as the return on risk-adjusted capital (RORAC).

SREP: evaluation of the ICAAP by supervisors

German supervisors' qualitative approach

Within the framework of the Supervisory Review and Evaluation Process (SREP), supervisors evaluate an institution's ICAAP and thus a bank's internal process for measuring and managing risk.[5]

In the SREP, supervisors' main focus is on whether the banks' internal procedures and processes guarantee effective risk management. Each individual bank must demonstrate to supervisors that the methods chosen and the choice of risk types included can be regarded as appropriate for that bank's specific situation.

Whereas, for smaller banks with simple business activities, it may suffice to have a risk-bearing capacity concept that is geared tight-

5 Work on the SREP has also been carried out at the European level: the Committee of European Banking Supervisors (CEBS), for instance, published standards for maximising the convergence of the SREP design in the individual member states. See CEBS, Guidelines on the Application of the Supervisory Review Process under Pillar 2, January 2006, available at http://www.c-ebs.org/standards.htm.

ly to the regulatory minimum capital requirements and to which further relevant types of risk (especially interest rate risk in the banking book) have been added, large, internationally active banks with a variety of business activities and a complex risk situation might well be expected to have their own models for market risk and the credit portfolio, and to use them within the framework of integrated present-value risk management.

In order to be able to assess the adequacy of a risk management regime, supervisors must analyse the respective institution at length. The intensive dialogue between supervisors and banks through supervisory discussions and examinations is therefore a central element of the qualitative supervisory approach.

On the basis of a bank's internal methods, supervisors judge whether the bank has adequate risk-bearing capacity, ie whether they agree with the bank's assessment that it has a sufficient quantity of internal capital to cover its risks. Both when calculating the capital requirement and determining the risk cover fund, supervisors draw a clear dividing line between internal and regulatory indicators. In the SREP, the regulatory minimum capital requirement is merely a yardstick with the help of which, in the discussions with the institutions, the level of the risks calculated internally is validated.

Section 45b of the Banking Act fundamentally allows supervisors to impose capital add-ons owing to inadequacies in the ICAAP. However, German supervisors will use this option only in exceptional cases since they hold that the best way to address flaws in the ICAAP is generally to request improvements to the bank's methods and processes.

Other supervisory approaches

Both Basel II and the corresponding EU directive leave scope for individual designs for the requirements as to the ICAAP.

Whereas the emphasis in Germany is on qualitative elements, the Financial Services Authority (FSA) in the UK orders the banks which it supervises to maintain individualised minimum capital ratios which, in some cases, are well above the 8% required by Basel II. US supervisors share the German point of view, although their rules differ in detail from Germany's: whereas, in the United States, large, internationally active banks have already been required to have an economic capital model since 1999, German supervisors generally leave it up to the institutions to implement suitable ICAAP methods.

The degree of self-responsibility regarding the types of risk to be factored in also varies worldwide. Whereas, in Germany, each bank decides for itself which types of risk to include and has to demonstrate to supervisors that it has made the right decision, other countries have special supervisory requirements as to the design of the ICAAP. In the UK and Italy, for instance, every bank is required to quantify risk concentrations in the ICAAP. In addition, the FSA requires all banks to quantify pension risks in the ICAAP owing to the fact that they, as employers, are highly involved in their employees' old-age pension plans.

International differences also exist with regard to stress testing requirements. The FSA requires the conduct of stress tests that reflect an economic downturn, such as is likely to occur on average once every 25 years. Spanish supervisors require advanced banks to produce a self-developed stress test; smaller banks are allowed a 10% general add-on to the minimum capital requirements to cover adverse market conditions. The German approach requires the analysis of appropriate scenarios and leaves it up to the institutions to design these scenarios in line with their own specific business and risk situations.

Preliminary supervisory evaluation of the economic capital concepts in German banks

Developments over the past few years

As early as 2004 and 2005, the Deutsche Bundesbank, together with BaFin, conducted a study at several German banks on the status of the implementation of economic capital concepts. A comparison with the current project reveals a mixed picture. Although it is good that all of the banks analysed thus far have now developed risk-bearing capacity concepts, the progress made by the institutions in their implementation still varies considerably. The background to this is probably, in many cases, that the implementation of the advanced risk measurement approaches for regulatory capital adequacy has tied up a large volume of resources over the past few years. With the most stressful phase of this implementation process now nearing the end, it is to be expected that the institutions will focus more strongly on improving the elective ICAAP elements.

Integrating the ICAAP into overall bank management

Irrespective of the degree of complexity of the risk measurement systems, the majority of large German banks are still in the process of systematically and fully implementing an economic capital management system. The risk-bearing capacity concepts have been implemented well at an overall bank level; however, the degree to which they are being used to generate management stimuli for individual business lines and subportfolios varies considerably, however.

In addition, it has become clear that only a fraction of many limits is being used, which means that, in practice, they can hardly produce management stimuli. In addition, some banks have identified problems with parallel management according to both regulatory and internal capital if both systems send out contradictory management signals. The institutions are aware that action needs to be taken here and are therefore working intensively on better integrating these concepts into their operational management.

Potential for improvement

Along with the positive results achieved, therefore, some issues have materialised which require further improvement. Examples include defining the key types of risk; in the case of smaller institutions, in particular, they are still heavily oriented to those risks for which regulatory minimum capital requirements exist. Thus, business and distribution risks are only rarely factored in, particularly by smaller banks, whereas other types of risk, such as market risk – which supervisors con-

sider to be immaterial in the case of individual banks – are integrated into the ICAAP. Both phenomena indicate that not all banks are yet internally addressing the issue of the materiality of risks.

Risks deriving from concentrations in certain regions, sectors, products and collateral, as well as dependence on individual counterparties, are often not yet sufficiently taken into account in the ICAAP. The turmoil in the US subprime mortgage market and its impact on individual German institutions has shown that it is precisely concentrations of risk in individual market segments which can cause difficulties for banks.

Correlations between types of risk, which lead to a reduction in the amount of overall risk, are factored in only by some larger banks. During on-site examinations, these banks are requested to demonstrate that the modelled diversification effects actually exist. In individual cases, further efforts are necessary here to furnish proof using realistic data without merely resorting to expert judgements.

Group-wide ICAAP

The large, internationally active banking groups generally aim for an integrated, group-wide ICAAP. Given that their business and risk management is often centralised, this approach is logical and sensible. Local management, however, must remain actively integrated in risk management since it bears corporate responsibility for the local subsidiaries. Furthermore, institutions must analyse whether, in a crisis, capital can be transferred within the group across national borders or the realms of company law without any impediments. Without wishing to pre-empt the outcome of the international discussion on this topic, from today's perspective there is much to be said for requiring banking groups active across national borders to demonstrate their risk-bearing capacity at the single-entity level. The methods used by the banks, however, can certainly be developed and managed centrally as long as they are suited to the situation of any particular part of the group.

Capital planning

In the area of capital planning, shortcomings currently still remain from a supervisory perspective. One key element of the ICAAP is a forward-looking assessment of the institution's future risk and capital situation. Currently, most institutions have a planning horizon of not more than one year, which cannot yet be described as planning for the future taking the business strategy and its associated risks as well as the risk-taking potential required in the future into account.

Stress tests

Further deficits in the assessment of future risks exist in the area of scenario analyses. Scenario-based stress tests are necessary to review whether an institution has a sufficient risk cover fund even under certain adverse market developments. It is the responsibility of each individual institution to define those future scenarios that are relevant and realistic in the light of its business activities. However, at present, many institutions conduct stress tests only for individual types of risk in isolation. There is often not yet an analysis of the combined impact of adverse developments on all types of risk. Therefore, extensive stress

tests should always play an appropriate role in the ICAAP as a key corrective to the statistically-based risk measurement procedures.

Summary

Most institutions are on the right track to implement the ICAAP, although there is definitely still potential for improvement from a supervisory perspective. The large, internationally active banks are able to identify their key risks and are working intensively on the ever more precise measurement of these risks. Smaller banks in many cases appear to not yet have made as much progress in risk measurement and are therefore often oriented to regulatory minimum capital requirements.

Despite the fact that institutions' measurement procedures are becoming more and more evolved, users must be aware that the models can neither predict nor map every possible market disruption. A model is not a substitute for sound risk management but is only a tool of internal risk management. The users of model results must therefore possess sufficient understanding of the limitations of the models' forecasting ability and also use additional information, analyses and supplementary procedures (such as the analysis of stress scenarios) as a basis for their decisions. This is a particularly important realisation in the light of the upheavals on the financial markets this year. Since the ICAAP is seen as a dynamic process by institutions and supervisors alike, it may be assumed that institutions will use the experience gained in the year 2007 to appropriately enhance their risk management methodologies and models.

It is a major challenge for supervisors to accompany the institutions in their development through intensive dialogue. The strong quality orientation of the supervisory approach in Germany means that, wherever supervisors find any weaknesses in the ICAAP, banks will most likely be instructed to improve their methodologies and procedures rather than be subjected to additional capital requirements.