

## Banks' internal methods for assessing and maintaining internal capital adequacy and their relevance to supervision

*Capital adequacy as well as effective management of banks' internal capital adequacy are material preconditions for financial system stability. Supervisors therefore attach considerable importance to ensuring internal capital adequacy. Germany's internal capital adequacy requirements are based on the relatively small number of principles-based standards laid down in Pillar 2 of the 2004 Basel II Framework. The core requirement to be met by institutions is the establishment of an Internal Capital Adequacy Assessment Process (ICAAP) with the goal of ensuring capital adequacy. Under the ICAAP, the institution is required to identify the material risk types, to quantify them using its own methods and to maintain adequate capital to back them; this capital must be of sufficient quality to absorb any losses that may arise. In order to maintain internal capital adequacy on an ongoing basis, it must be enshrined in banks' decision-making processes, their business and risk strategies and their risk management and control processes. This requires the ICAAP to be, amongst other things, an integral part of banks' limit systems and internal reporting frameworks.*

*As part of the Supervisory Review and Evaluation Process (SREP), banking supervisors regularly review and evaluate the suitability of banks' methods and processes, as well as their capital adequacy. Experience has shown that the methodology of German credit institutions' ICAAP has evolved significantly since 2004. However, there is still room for improvement – as a case in point, risks should be assessed in a more comprehensive, forward-looking manner than they have been up to now. Moreover, institutions should examine the limits of the methods used for quantifying risks more intensively. Supervisors have at their disposal a broad toolkit of measures for remedying potential deficiencies in the ICAAP; for example, they can order institutions to rectify methodological or process-related deficits or can especially impose higher capital requirements.*

*As regards the ratio of available financial resources to risk, the deep scars left by the financial market crisis are currently still visible across institutions and groups of institutions. Although many institutions have recovered from the critical condition they were in at the height of the crisis, further efforts are still necessary to ensure that institutions' internal capital adequacy remains sustainable in the long term.*

## Ongoing dialogue between institutions and supervisors

Section 25a of the German Banking Act (*Kreditwesengesetz*) forms the legal basis for dialogue between institutions and supervisors on issues relating to business organisation and risk management. In the Minimum Requirements for Risk Management (*Mindestanforderungen an das Risikomanagement*), supervisors lay out the details of the provisions of that legislation. Many meetings with senior management, as well as on-site inspections, centre on the discussion of banks' internal capital adequacy approaches: in contrast to the much more highly norms-based approach of Pillar 1, the principles-based design of the Pillar 2 requirements gives institutions great latitude in implementing the methods they are using. This freedom to choose their own methods initially made institutions quite visibly uncertain as to whether the design of their internal procedures would meet supervisory requirements. The publication of the paper, the English version of which is entitled "Supervisory assessment of bank-internal capital adequacy concepts" (ICA Manual),<sup>1</sup> in December 2011 provided the necessary transparency regarding supervisory assessments and created a comprehensible, uniform framework for administrative actions. The Manual illustrated that supervisors, in their case-by-case assessments, adhere to the precept of complete risk mapping, procedural consistency and the principle of prudence. Specifically, with regard to numerous frequently and hotly debated issues, the Manual drew a clear line between permissible discretionary scope in choosing methods and arbitrariness which leads to outcomes that are no longer objectively verifiable.

The two most recent revised versions of the Minimum Requirements for Risk Management (2010 and 2012) also fleshed out the provisions governing internal capital adequacy. Institutions' uncertainty has receded markedly in the meantime. Dialogue between institutions and supervisors is ongoing because the ICAAP needs to be revised and adjusted regularly to

accommodate changes in internal and external framework conditions.

This article will initially discuss the relationship between Pillar 1 and Pillar 2, before going into the fundamental approaches which exist in practice to assess and maintain internal capital adequacy and how, in these approaches, risk is quantified and the available financial resources (AFR) are determined. This article largely confines itself to the methodological aspects concerning the quantitative part of the ICAAP. A few examples of some of the methodological deficiencies in institutions' management of internal capital adequacy frequently observed in supervisory practice will be described. This will be followed by a section on how supervisors deal with such flaws under the SREP.

## Pillar 1 versus Pillar 2

Pillar 1 and Pillar 2 of the Basel Framework differ fundamentally in terms of their focus. The objective of Pillar 1 is to define internationally harmonised own funds requirements that cover as many institutions worldwide as possible. This regulatory perspective is complemented by Pillar 2, which follows a more individualised, but also more comprehensive, approach that looks at all risks and at the resources available to cover them.

To achieve an extensive standardisation of capital requirements under Pillar 1, supervisors follow a rules-based supervisory approach which sets forth how credit institutions are to calculate the required amount of own funds. Even where institutions decide to use internal risk measurement approaches approved by supervisors, such approaches are guided to a large extent by supervisory rules and regulations.

*Pillar 1:  
extensive  
standardisation*

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<sup>1</sup> This paper, published on 7 December 2011, is available online at [http://www.bundesbank.de/Redaktion/EN/Downloads/Core\\_business\\_areas/Banking\\_supervision/Marisk/2011\\_12\\_07\\_supervisory\\_assessment\\_bank\\_internal\\_capital\\_adequacy\\_concepts.pdf?\\_\\_blob=publicationFile](http://www.bundesbank.de/Redaktion/EN/Downloads/Core_business_areas/Banking_supervision/Marisk/2011_12_07_supervisory_assessment_bank_internal_capital_adequacy_concepts.pdf?__blob=publicationFile).

Supervisors define not only counterparty credit risk, market risk and operational risk, the three types of risk to be included in the calculation, but also the own funds deemed appropriate to absorb losses; they also stipulate the overall amount of own funds to be held.

A considered approach to risks is not only in the own best interests of any institution seeking sustainability but is also the precondition for preventive banking supervision, which requires an undistorted view of institutions' risk profiles. This is why supervisors examine whether every individual institution's methods for assessing and maintaining internal capital adequacy are suitable, applying the principle of proportionality in doing so. Only if the material risks have been captured and mapped fully, the assumptions in the ICAAP are inherently consistent and coherent and the ICAAP may be regarded as appropriate given the institution's business activity will supervisors approve the procedures defined by the institution.

*... basis for preventive banking supervision, ...*

*Pillar 2: holistic, individualised, ...*

The standardised rules of Pillar 1 are intended to make own funds requirements internationally comparable. However, these supervisory guidelines are limited in their ability to do justice to the vastly different risk situations of individual institutions. They are, therefore, supplemented in Pillar 2 by institution-specific assessments of capital and risk situations. It is primarily the obligation of the institutions themselves to identify all material risks in a forward-looking holistic approach, to use appropriate methods to quantify them and to hold sufficient capital to back them. This, in principle, purely economic view of risk and capital is obscured in practice, however, by the regulatory standards of Pillar 1 and accounting requirements, which likewise have to be fulfilled. Depending on individual institutions' preferences, the methods adopted range from the "Pillar 1 Plus approach", which merely supplements the Pillar 1 calculation with risks and risk concentrations not covered under Pillar 1, to procedures which are largely divorced from the guidance given by Pillar 1 and accounting standards.

The two Basel Pillars differ not only in terms of the type of regulation, the comprehensive coverage of all material risks and the transition from a supervisory to an institutional perspective, but also with regard to another major aspect. Whereas the focus of Pillar 1 is on current business activity, under ICAAP institutions are required to factor in how changes in their own business activities as well as in their market environment could impact on risks and internal capital adequacy in future.

*... forward-looking ...*

This pronounced forward-looking perspective, in conjunction with a holistic approach and the many methodological questions that require appropriate responses from credit institutions, make the ICAAP a major challenge.

*... and challenging*

*... free choice of method and principle of proportionality, ...*

Under Pillar 2, institutions have very wide latitude in the choice of methodology and are called upon to define suitable processes and procedures themselves, thus "pushing the envelope" of the Pillar 1 standardisation limits. Pursuant to the principle of proportionality, it is up to each individual institution to develop the methods and processes it uses in line with the nature, scope, complexity and riskiness of its activities. Institutions' freedom to choose their own methodology ends wherever methods are applied arbitrarily and inconsistently, thus rendering appropriate and effective risk management impossible.

## **Different approaches to assessing and maintaining internal capital adequacy**

In practice, two fundamental approaches to assessing and maintaining internal capital adequacy used by institutions have evolved: going concern approaches and gone concern approaches. What both approaches have in common is that all of an institution's material risks are measured and managed over a risk horizon – usually one year. Strict risk measures and

*Basic approaches to managing internal capital adequacy*

parameters assuming rare loss situations must also be used to quantify these risks. These calculated risks are then offset against the AFR suited to covering losses that materialise. In addition to these similarities, there are considerable differences in the fundamental thrust of the two approaches and the objectives that they each pursue.

*Going concern approaches*

The aim of going concern approaches is to ensure the institution's survival even if losses occur over the risk horizon. Since such survival is predicated on the fulfilment of the Pillar 1 regulatory own funds requirements, it is necessary for institutions to set aside the requisite capital components for Pillar 1. This capital is consequently not available to absorb potential losses for internal capital adequacy purposes, which means that it cannot be part of the AFR.

*Gone concern approaches*

By contrast, gone concern approaches do not focus on protecting proprietors but rather creditors. The aim of such approaches is that, even *in extremis*, ie if all of the risks factored into the management of internal capital adequacy materialise, the institution's creditors can be paid from what is left of the institution's assets, thus shielding them against losses. The fundamental assumption is not that liquidation will actually occur but, instead, that future losses which arise over the risk horizon may possibly lead to liquidation in the future.

*Potential arbitrage – close monitoring by supervisors*

Going concern and gone concern approaches are two different perspectives which are both suitable for ensuring internal capital adequacy. Rare losses are to be modelled in risk measurement in both approaches; in gone concern approaches, low-probability (but with a higher severity) events are captured since, in these approaches, no additional reserves are available to satisfy creditor claims beyond the AFR. By contrast, if going concern approaches are used and the risks which materialise are so great that they devour the AFR entirely, the capital needed to meet the regulatory minimum capital requirements is still available to fund any restructuring or resolution which might be ne-

cessary. The possibility of saving capital by means of arbitrage between the two approaches is, therefore, restricted.

It is natural that supervisors have an interest in both keeping institutions going and protecting creditors. They have, therefore, laid down this fundamentally desirable duality in the ICA Manual and, since the 2012 revisions to the Minimum Requirements for Risk Management, have also enshrined therein the requirement that internal capital adequacy approaches must ensure both an institution's ability to continue as a going concern and the protection of creditors against economic losses.<sup>2</sup> The internal capital adequacy toolkits of all institutions must take account of both objectives. Institutions choosing a gone concern approach must, at all events, set up supplementary procedures with which they can ensure compliance with the Pillar 1 capital requirements since a gone concern approach by itself is insufficient to achieve this objective. By contrast, for the numerous institutions applying a going concern approach, this approach may suffice on a stand-alone basis. However, an institution using the approach has to ensure that the capital set aside for compliance with the minimum capital requirements is effectively available in full to satisfy creditors' claims.

In practice, institutions' internal capital adequacy toolkits differ from one another not only with regard to these two fundamental approaches but also in how the AFR are derived. A large percentage of institutions derive their AFR from balance sheet items or the P/L account as part of their primarily management-related procedures; some institutions derive their AFR on the basis of full fair values. These two options for determining the AFR and the two basic internal capital adequacy approaches can be used to create four different combinations, in theory.

*Are two internal capital adequacy approaches necessary?*

*AFR derived from balance sheet items or full fair values*

<sup>2</sup> See AT 4.1 number 8 of the Minimum Requirements for Risk Management in the version of 15 December 2012.

*Consistent  
methods ...*

It is methodologically consistent to derive the AFR in a balance-sheet-based manner in going concern approaches and on a full fair value basis in gone concern approaches. In these two cases, the method of determining the AFR is directly compatible with the basic internal capital adequacy approach. Going concern approaches are especially geared towards ensuring long-term compliance with the Pillar 1 capital requirements. As the latter are derived from the balance sheet, it is only logical to base the definition of the AFR on balance sheet items. In gone concern approaches, however, the issue at stake is the institution's capital in the case of a notional liquidation. As this capital that can be used to satisfy creditor claims corresponds exactly to the value of the institution's assets, determining the AFR using full fair value criteria is consistent in such approaches.

*... and incon-  
sistent methods*

Using balance sheet values as the basic variables in a gone concern approach initially represents a methodological inconsistency. The only way to establish consistency with the underlying idea behind the approach is to adjust these values adequately, and ultimately to calculate the enterprise's present value indirectly. Supervisors are aware of the methodological complexity faced by institutions using this approach. The assessment of such an approach hinges crucially on the impact of these methodological inconsistencies on how internal capital adequacy is determined.

What is likewise methodologically problematic is a combination of determining the AFR on a full fair value basis and a going concern approach, since compliance with the Pillar 1 capital requirements is, in this case, no longer a given. The reason for this is that the Pillar 1 capital requirements are based on balance sheet values, while the AFR in the internal capital adequacy plan are derived from the present value. Practice has shown that it is impossible to find a consistent method of reconciliation in such cases. Such approaches, therefore, require the creation of an additional, methodologically consistent risk management steering approach.

## **Risk types and quantification of risk**

The measurement and management of all material risks first requires a risk inventory, ie a full stocktake of the risks to which an institution is exposed. In such an inventory, institutions generally capture, at the very least, counterparty credit risk, market risk (including interest rate risk in the banking book), operational risk and risk concentrations. However, the risk of a rise in funding costs remains insufficiently accounted for in many cases. Additional types of risk that tend to be more difficult to quantify, such as strategic risk, business risk and reputational risk, are measured using scenario analyses by methodologically advanced institutions and, otherwise, are often included through a lump-sum amount covering other risks. As German credit institutions' business models are highly heterogeneous, the Minimum Requirements for Risk Management can provide only general examples of material risks. Owing to a lack of generally applicable definitions for the other types of risk, institutions face the task of independently identifying their risks in a comprehensive and clear manner. Institutions need to have such flexibility, too, in order to delineate those risk types which are consistent with their internal management philosophy.

Although the choice of the appropriate method of risk measurement should be made according to the principle of proportionality, this principle can play only an extremely limited role in the actual application of a certain risk measurement method, however. If an institution with manageable, simple and low-risk business activities opts for an advanced method of quantifying risk, it cannot put forward its small size or the low complexity of its business with regard to the benchmarks for the method's application. Instead, what proportionality means here is that this institution, too, is required to meet the demanding prerequisites and conditions for the proper use of its chosen risk quantification method.

*Risk inventory*

*Choice and  
application of  
methods*

*Complexity of  
credit portfolio  
models*

This can be illustrated particularly well in the example of using credit portfolio models to measure counterparty credit risk (see the box on page 35). Whereas large, methodologically advanced institutions are more likely to be in a position to meet the extensive requirements and to procure the resources needed to adequately apply, parameterise and validate a credit portfolio model, small and medium-sized institutions often have problems with the critical analysis of risk quantification methods required by the Minimum Requirements for Risk Management. Institutions must always be aware of the limits of a complex method which result, above all, from simplifying model assumptions and from the underlying data used to estimate the parameters. The Bundesbank's on-site inspections of banking operations have shown that many banks have not yet subjected their key model assumptions, input data quality or model results to sufficient critical review. Institutions which lack adequate risk management resources to fulfil the required preconditions for using complex models have either to build up the methodological expertise needed for complex methods or to choose more simple methods commensurate with the limited scope of their business activities and risk situation, the appropriate application of which they can guarantee.

*Credit spread  
risk and migra-  
tion risk*

A further challenge facing institutions is how to adequately capture credit spread risk and migration risk. The credit spread, as a risk premium for credit risk exposures to the risk-free and maturity-matched interest rate, also contains expected migrations, and so it is impossible to avoid overlap entirely when determining credit spread risk and migration risk in risk measurement. Consequently, institutions can adjust the value-at-risk (VaR) to be recognised for internal capital adequacy purposes to factor in this overlap. However, this procedure must be supported vis-à-vis supervisors through a well-founded approach which also takes due account of the stability of the effect over time. Supervisory practice has shown that the methods used by institutions for this purpose

usually fail to fulfil these requirements at present.

When quantifying market risk, German institutions use established methods with which they have accumulated experience across various market phases. Although these methods enabled reliable risk management in the past, they came up short in the financial market crisis. When integrating complex products into market risk measurement, too, the methods used often show material deficiencies. The Minimum Requirements for Risk Management therefore embody the principle that, prior to purchasing or issuing such complex products for the first time, institutions must already consider how to model them in their risk management and risk control processes. This also applies to mutual fund investments which need to be transparent through to the individual positions in order to be recognised by supervisors. The box on the risk horizon on page 37 discusses the methodological hurdles to integrating market risk into internal capital adequacy approaches.

*Market risk*

Interest rate risk in the banking book has a particular significance for many institutions owing to its concentration in lending and deposit business and the associated maturity transformation, which is economically important. The methods and procedures chosen to measure and manage interest rate risk in the banking book must be consistent with the internal capital adequacy management approach. Either accounting-based approaches or present value approaches can be used. The present value effects on own funds of a sudden, unexpected shift in interest rates of  $\pm 200$  basis points already have to be calculated and reported to supervisors pursuant to Circular 11/2011 (BA).<sup>3</sup> The internal measurement and management of interest rate risk in the banking book, however,

*Interest rate risk  
in the banking  
book*

<sup>3</sup> This Circular is available (in German only) on the Bundesbank's website at [http://www.bundesbank.de/Redaktion/DE/Downloads/Kerngeschaeftsfelder/Bankenaufsicht/Rundschreiben\\_Bafin/2011\\_11\\_zinsaenderungsrisiken\\_rundschreiben.pdf](http://www.bundesbank.de/Redaktion/DE/Downloads/Kerngeschaeftsfelder/Bankenaufsicht/Rundschreiben_Bafin/2011_11_zinsaenderungsrisiken_rundschreiben.pdf).



## Managing counterparty credit risk with credit portfolio models

For many credit institutions, credit portfolio models are a key tool for quantifying and managing their counterparty credit risk exposure. As can be expected, these are chiefly large credit institutions which use advanced methodologies. However, a large number of savings banks and credit cooperatives, too, are opting to deploy systems developed within their respective associations.

Credit portfolio models serve to quantify potential unexpected losses within the risk horizon, ie losses that exceed expected levels. In these models, comprehensive simulations or analytical approximations are conducted so as to determine the probability distribution of future creditworthiness-related changes in the value of the credit portfolio. Depending on the type of model used, the observed movements in value might be changes either in the present values or in the balance sheet valuations of credit risk positions owing to the accounting standards used. The values in question must, however, be consistent with the methodology of the institution's management approach.

For many credit institutions, value-at-risk (VaR) is still the only risk measure used for quantifying the unexpected loss. Alternative risk measures, such as the expected shortfall (ES), have not yet gained a foothold in the banking industry. VaR designates the potential loss which will not be exceeded with a certain degree of probability (namely, the chosen confidence level) and thereby completely disregards the potential loss above this threshold. ES, meanwhile, denotes the loss that is expected to occur if VaR is exceeded. The established models used within the banking industry, which are mostly based on approaches known from the literature such as Credit Metrics, CreditPortfolioView or Credit Risk+, differ conceptually in terms of the aspects of counterparty credit risk they model, their underlying assumptions regarding the distribution of the number of defaults and the loss given default (LGD). However, the commonly used approaches all assume conditionally independent default or migration events.

Inputs not only include the relevant position data but also, depending on the model in question, a wide variety of parameters which need to be estimated appropriately. These parameters include default and migration probabilities, the LGD and its distribution parameters, cash flow structures for the individual positions and discount rates that adequately reflect risk and, finally, correlation parameters. A number of models source some of these inputs from complex pre-processing systems.

Many institutions have found that the raw data remain the most significant obstacle to applying the model properly. Where the majority of German institutions have made the greatest strides is in estimating parameters such as probabilities of default (PD) and LGD, which also form part of the Internal Ratings-Based (IRB) approach. However, owing to the requirements for the length of the time series, the greatest challenge lies, as hitherto, in defining the correlation parameters, particularly so if they are to be estimated on the basis of default data.

Much like the IRB approaches introduced by Pillar 1, pooling solutions are likewise commonly used in credit portfolio models. They offer the advantage of reducing the time and effort involved in developing and maintaining the systems, and of expanding the meagre raw data. It should, however, be borne in mind that a meaningful estimation of parameters is only possible if the input data and the underlying credit processes are adequately transferable. The first difficulties arise in uniformly defining and recording defaults and losses as well as comparable procedures for determining collateral value. Many other questions also need to be tackled, such as whether the same correlations can be used for credit portfolios in different regions. Addressing such problems notably necessitates a comprehensive and prudent quantitative and qualitative validation by institutions and model developers alike. Furthermore, the parties involved and supervisors need to engage in an intensive dialogue in order to facilitate an appropriate assessment.

should also cover other scenarios apart from this interest rate shock. In most cases, it is probably not enough to capture only a parallel shift in the yield curve.

*Operational risk*

Operational risk, too, is a material risk for most institutions. The very recent cases of losses caused by legal risk and internal fraud show the need to tackle this type of risk not only at a procedural level but also by reserving capital within an internal capital adequacy framework. Following a clarification to this effect in the 2009 version of the Minimum Requirements for Risk Management,<sup>4</sup> nearly all institutions factor operational risk into their internal capital adequacy plans as a material risk.

*Additional types of risk generally exist at institutions*

Institutions generally identify the existence of additional types of risk above and beyond the "classic" risks already mentioned. They define these risks very differently, however. Occasionally, additional risks are recorded as a subcategory of another type of risk (such as part of operational risk). For additional types of risk, too, institutions are required to use a risk inventory to determine whether they are material within the meaning of the Minimum Requirements for Risk Management. If they are, institutions have to ensure that these risks, like the other material risks, are properly modelled in their internal capital adequacy assessments. Supervisors are aware that not all institutions have fully perfected methods or sufficient raw data to quantify these risks for now. However, the complete omission of the relevant risks from the internal capital adequacy framework for this reason is not an option; rather, in such cases, it is necessary to set aside a lump sum based on a plausibility check. The plausibility check can be conducted, for example, using a qualified expert assessment or by means of stress tests. Should it be impossible to include individual types of risk in the internal capital adequacy framework owing to their specific nature, the institution must plausibly substantiate any exclusion. This concerns, for instance, liquidity risk in the narrower sense, which includes the threat of insolvency. By contrast, re-

financing risk, ie the risk arising from increased funding costs, needs to be factored into the internal capital adequacy framework if it is material owing to its potential to cause losses and negative effects on the present value. Irrespective of inclusion in the internal capital adequacy framework, institutions need to cover all risks adequately in their risk management and risk control processes.

The Minimum Requirements for Risk Management stipulate that, based on the overall risk profile, institutions must make sure that material risks are constantly covered by AFR, thus ensuring internal capital adequacy. For this purpose, the contributions of the various material risks need to be aggregated consistently and systematically into an overall risk and offset against the AFR.

In the past, risk-reducing diversification effects between risk types factored into institutions' internal capital adequacy approaches have often proved to be insufficiently robust when the risk event actually materialised. In fact, Bundesbank analyses show that, especially in times of economic strain, contagion effects can cause overall risk to exceed the sum of individual risks. Supervisors' expectations regarding the factoring in of diversification effects were already incorporated into the 2010 revision of the Minimum Requirements for Risk Management. Risk-reducing diversification effects must accordingly be based on assumptions stemming from an analysis of an individual institution's circumstances, be calculated on the basis of representative data and be estimated conservatively enough to be assumed to be sufficiently stable even in economic downturns and under unfavourable market conditions. Recent findings from practical experience show that those few institutions seeking to claim diversification effects between risk types fail by not providing empirical evidence of the presumed

*Aggregation of individual risks into overall risk*

*Factoring in risk-reducing diversification effects*

<sup>4</sup> See AT 2.2 number 1 of the Minimum Requirements for Risk Management (2012).



## Risk horizon

The aim of all processes to ensure internal capital adequacy is to safeguard the institution's viability over the entire risk horizon, which is usually set at one year for all types of risk.

In the field of market risk, this means that, even if the holding period for individual positions is shorter due to trading or temporary closing out, overall AFR utilisation must not exceed the AFR allocated to such risk as a whole for the entire risk horizon. Because this economic principle was often disregarded by institutions, supervisors clarified the issue in No 95 of the ICA Manual.

For banking practice, this means that holding periods can be less than 250 trading days and that such an assumption can be in line with an economic view over a one-year horizon. However, if holding periods are assumed to be shorter than the internal capital adequacy assessment horizon, institutions must make appropriate assumptions as to how their market risk will evolve throughout the remainder of the risk horizon. The chart below shows several procedures to consistently map the holding period to

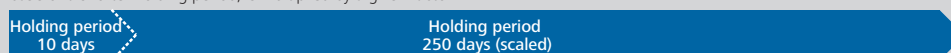
the risk horizon seen in practice. The most frequently used procedure is to scale the risk of individual positions to a one-year horizon. Methodologically advanced institutions attempt to model their concrete limit structure, recognition and response times, market liquidity aspects and the trading strategies pursued in a simulation. Based on the Pillar 1 process of using the incremental risk charge to measure default and migration risk, institutions can also use the underlying "constant level of risk" methodology.

A final possibility would be to assume deleveraging (or hedging) before the end of the risk horizon. This scenario implies an abrupt reduction or termination of business and therefore requires close analysis of the institutions' own business models and sources of income. Institutions would have to justify such less-than-conservative assumptions not only theoretically but also based on real-world situations. Recent experience from the financial market crisis raises doubts concerning the necessary will and economic ability of many market participants to use such a procedure.

### Four methods of integrating market risk into a standardised risk horizon

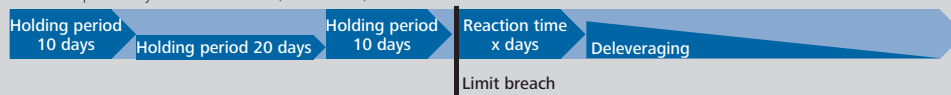
#### – Scaling risk for individual positions to 250 trading days:

Individual positions in a portfolio are assumed to remain unchanged over the entire risk horizon and the value at risk, measured on the basis of a shorter holding period, is multiplied by a given factor.



#### – Simulation:

Realistic portfolio shifts during the risk horizon are included, as are anticipated measures by the institution if the current risk level exceeds a previously defined risk limit (limit breach).



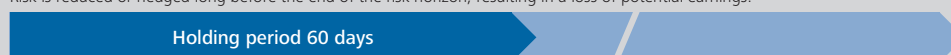
#### – Constant level of risk:

New investment in individual positions of similar risk following the sale of the original positions is assumed.



#### – Complete deleveraging before the end of the risk horizon (exception):

Risk is reduced or hedged long before the end of the risk horizon, resulting in a loss of potential earnings.



Risk horizon (internal capital adequacy) of one year

diversification. Supervisors therefore see this as a vindication of their restrictive approach.

## ■ Available financial resources

*Components of AFR*

The volume and composition of the AFR are closely connected to the approach chosen to ensure internal capital adequacy. Institutions choosing a gone concern approach can include in the AFR all capital components which would absorb losses in the assumed case of a potential liquidation. By contrast, the definition of the AFR for institutions using a going concern approach is based on the concept of "own funds" originating in Pillar 1 (implemented in Germany through the Solvency Regulation (*Solvabilitätsverordnung*)). Therefore, for the purposes of internal risk management, at most only that part of capital left over after deducting prudential capital requirements and available in a going concern may serve as AFR.

*Projected earnings*

In connection with the balance sheet method of deriving the AFR, experts have devoted particularly intense discussion to how to deal with expected earnings from already contracted business and with hidden losses. In going concern approaches, the practice of also using potentially loss-absorbing components of projected earnings to offset quantified risks is widespread. There is initially an inconsistency between an internal capital adequacy approach which rests entirely on currently available capital – as is, by the way, also the case in the prudential Pillar 1 – and regarding expected asset growth as a suitable buffer for the materialisation of risks. In the context of the economic view in Pillar 2, however, it can be acceptable to recognise conservatively calculated earnings components in the AFR when using going concern approaches. Conservative calculation is predicated on appropriate recognition of potential fluctuations in earnings, for example, by applying suitable haircuts or by explicitly modelling business risk.

Whatever management procedure they choose, institutions have to deal with the hidden losses resulting from the discrepancy between market values and balance sheet values in their accounting. Hidden losses signal a mismatch between balance sheet valuation and the current economic situation. Following the logic of a gone concern approach, it is absolutely imperative for hidden losses to be factored into internal capital adequacy, as either a risk-increasing or an AFR-reducing component, in order to ensure that the desired goal of creditor protection can be met at all times. With respect to going concern approaches, by contrast, hidden losses do not have to be factored in initially if the institution has, without any doubt, the will and ability to hold to maturity and the assumed reinstatement of value is guaranteed. However, Pillar 2 goes above and beyond the definition of methodologically consistent approaches to pursue, above all, the aim of an economic view of institutions' internal capital adequacy. The Minimum Requirements for Risk Management therefore demand not only that the limits and constraints arising from the methodologies and procedures used are made visible but also, explicitly, that creditors are protected against losses. It is, therefore, only logical to require institutions with considerable hidden losses to also factor these losses into their going concern approaches for internal capital adequacy purposes if a management-relevant gone concern approach, in which hidden losses need to be factored in *per se*, has not been implemented at the same time. The ICA Manual throws light on how supervisors expect hidden losses to be dealt with in terms of methodology.

*Hidden losses ...*

Following the economic approach of Pillar 2, there is a symmetrical relationship between hidden losses and hidden reserves. In balance-sheet-based approaches, the latter can, in principle, be assigned to the AFR. However, supervisors expect institutions to take due account of the imponderables and limits of unlocking hidden reserves within the internal capital adequacy approach used by the institution.

*... and hidden reserves*

## ■ Capital planning

*Commitment to forward-looking capital planning process*

Through the call for material risks to be covered by AFR, capital planning has become an indispensable element of securing internal capital adequacy over the medium to long term. Supervisors have accordingly set requirements for a forward-looking multi-year capital planning process as an addition to the internal capital adequacy plan (with its horizon of usually one year), thereby underscoring institutions' obligation and responsibility to ensure regulatory and internal capital adequacy.

*Regulatory and internal capital requirements*

In the capital planning process, institutions must identify their regulatory and internal capital requirements in a timely manner and take appropriate measures to cover the requirements at an early stage, even in an unfavourable environment. Since an analysis such as multi-year capital planning which stretches far into the future is fraught with all sorts of uncertainties, the capital planning process does not need to be as all-encompassing as the internal capital adequacy analysis and, instead, often ends up becoming more of a rough estimate of capital requirements above and beyond the internal capital adequacy horizon. Institutions must include changes in their own business activities, strategic objectives and the economic environment as key aspects of their capital planning. Unexpected, adverse developments also need to be included in capital planning in order to increase institutions' sensitivity to critical situations and to give them the necessary management stimuli. Various scenarios should accordingly also look at those developments which deviate from expectations and assumptions in the planning processes.

*Risk-reward link still worthy of improvement*

A forward-looking capital planning process is not only international standard practice but is, particularly also at major German credit institutions, an integral part of medium-term business planning and the basis for fundamental strategic thinking. Institutions are not capitalising fully on the option of using capital planning for medium to long-term risk analysis, too, from

which they can obtain management stimuli for their risk situation. It has continued to be shown in practice that not all institutions attach adequate importance to potentially adverse developments in their capital planning and, therefore, do not take sufficient account of limiting factors when raising capital.

In practice, the capital planning is usually put into operation for regulatory capital requirements through a definition of minimum capital ratios (such as the tier 1 capital ratio); for internal capital requirements, it is done through a definition of minimum risk coverage ratios to ensure internal capital adequacy. Owing to their standardisation and comparability, regulatory capital ratios are increasingly coming to the attention of external observers such as the European Banking Authority (EBA) or rating agencies. Institutions must ensure that they meet the requirement stipulated in the Minimum Requirements for Risk Management of giving equal and adequate treatment to regulatory capital requirements and internal capital requirements in their capital planning process.

*Spotlight on regulatory capital requirements*

## ■ Prudential measures in the SREP

Alongside the ICAAP requirements that institutions must meet, Pillar 2 of the Basel Framework contains a second key element: in the SREP, supervisors have to look intensively at individual institutions' methodologies, processes, procedures and strategies and to assess their suitability with regard to ensuring internal capital adequacy over the long term. German supervisors are convinced that the SREP must be based on an analysis and assessment of the institution's own information and methodologies as well as the risk metrics derived from them. The institutions themselves ought to be best placed to know and evaluate their risks. However, this in no way means that supervisors rely solely on the institutions' figures and methodologies. Rather, they subject this information to intense scrutiny and, in their assessments,

*Intensive review of the ICAAP in the SREP*

take into account deficiencies in institutions' methodologies and processes. Supervisors are attaching growing importance to data storage and management information systems as central prerequisites for a functioning risk management framework and will also increasingly shine a spotlight on these factors when assessing the ICAAP.<sup>5</sup>

*Measures in the case of deficiencies*

Under the SREP, supervisors also take appropriate prudential action to remedy deficiencies in institutions' individual risk measurement and risk management practices. In total keeping with the preventive, qualitative character of Pillar 2, German supervisors have always held that deficiencies identified in an institution's risk management have to be rectified in a timely manner. Experience in the area of internal market risk models, for instance, has also shown that imposing accompanying capital add-ons provides an incentive for institutions to remedy deficiencies in methodologies or processes quickly. Moreover, in these cases, the additional capital can be used to absorb potential losses caused by process-related deficits. It is additionally a risk mitigant as this capital cannot be used to back new business. The use of capital add-ons makes sense particularly as long as deficiencies exist which impact directly on internal capital adequacy, such as not factoring in all risks.

Based on this experience and thinking, German supervisors are already applying capital add-ons more frequently than before and intend, in future, to use this instrument systematically, but without abandoning their fundamental focus on the quality of processes. Supervisors are not planning to implement a supervisory risk measurement model. Their goal, rather, is for institutions to holistically identify, measure and manage their risks in the ICAAP independently and out of their own economic self-interest: after all, a functioning internal risk management system is a key factor in the stability of the banking system.

*European guidance*

However, with regard to Pillar 2, German supervisors are operating within an increasingly

Europeanised regulatory framework. The EBA has already published guidelines on ICAAP-related issues in the past. It is additionally working on guidelines to harmonise Pillar 2 supervisory processes. These efforts also need to be seen in connection with the forthcoming Single Supervisory Mechanism (SSM) to be domiciled at the European Central Bank. The national Pillar 2 supervisory processes still vary considerably across Europe at present. Many countries are pursuing something more akin to a "Pillar 1 Plus approach", in which the SREP is designed to quantify risks not captured by Pillar 1 with the help of supervisory models, and to impose capital add-ons on institutions. It is currently impossible to say how the European convergence efforts will impact on the SREP for German institutions.

## ■ Conclusions and outlook

In the past few years, institutions have made great strides towards consistent procedures for ensuring internal capital adequacy. Supervisors have observed that greater consistency in deriving the AFR has meanwhile been achieved across the entire banking sector. The discussions held during on-site inspections of banking operations and normal meetings with senior management therefore nowadays hardly touch upon basic methodological issues but cover, above all, detailed issues specific to individual institutions, as well as the integration of internal capital adequacy methodologies into business and risk management processes.

*High degree of consistency with regard to the AFR*

Owing to the general freedom to choose methods, a wide variety of risk measurement and risk management procedures exist. Unlike with regard to the composition of the AFR, it is much more difficult to set forth universally applicable basic methodological considerations in this area. In the past few years, the events dur-

*Evolution of risk quantification standards*

<sup>5</sup> The Basel Committee on Banking Supervision has developed guidance on this. See Basel Committee on Banking Supervision, Principles for effective risk data aggregation and risk reporting (BCBS 239), January 2013.

ing the financial market crisis, the intensive dialogue between institutions and supervisors and the extensive allocation of institutions' internal capacities have caused the internal capital adequacy management practices of German institutions to evolve significantly; these practices hold up well in a comparison with the rest of the world, too.

*Progress in methodologies and processes, ...*

Institutions' toolkits are now in much better shape than before the financial market crisis. However, institutions still have some catching up to do with regard to reflecting critically on the limits and constraints of risk quantification methods. What supervisors expect of institutions above all is that they examine more closely the fact that, while risks are always forward-looking, many of the risk quantification methods used are still mostly or exclusively backward-looking.

Whereas there has been progress regarding internal capital adequacy methods on the whole, in terms of the ratio of AFR to risk the deep scars caused by the financial market crisis are still clearly visible across institutions and groups of institutions alike. Each individual institution's internal capital adequacy situation depends not only on the efforts of the institutions themselves and of supervisors but, not least, also on future developments in the financial markets. For institutions, this uncertainty means that they must work to improve their capital base on a long-term and sustainable basis while, at the same time, pressing on with forward-looking risk measurement. Supervisors, for their part, are called upon to create internationally comparable requirements and to demand comparable capital levels for similar or equal risks.

*... challenges from market turmoil*