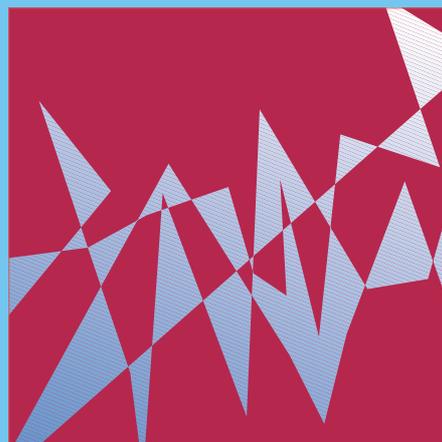


GUIDELINES ON CREDIT RISK MANAGEMENT

Credit Approval Process and Credit Risk Management



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in cooperation with the Financial Market Authority (FMA)*

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Preface

The ongoing development of contemporary risk management methods and the increased use of innovative financial products such as securitization and credit derivatives have brought about substantial changes in the business environment faced by credit institutions today. Especially in the field of lending, these changes and innovations are now forcing banks to adapt their in-house software systems and the relevant business processes to meet these new requirements.

The **OeNB Guidelines on Credit Risk Management** are intended to assist practitioners in redesigning a bank's systems and processes in the course of implementing the Basel II framework.

Throughout 2004 and 2005, OeNB guidelines will appear on the subjects of securitization, rating and validation, credit approval processes and management, as well as credit risk mitigation techniques. The content of these guidelines is based on current international developments in the banking field and is meant to provide readers with best practices which banks would be well advised to implement regardless of the emergence of new regulatory capital requirements.

The purpose of these publications is to develop mutual understanding between regulatory authorities and banks with regard to the upcoming changes in banking. In this context, the Oesterreichische Nationalbank (OeNB), Austria's central bank, and the Austrian Financial Market Authority (FMA) see themselves as partners to Austria's credit industry.

It is our sincere hope that the OeNB Guidelines on Credit Risk Management provide interesting reading as well as a basis for efficient discussions of the current changes in Austrian banking.

Vienna, Dezember 2004



Univ. Doz. Mag. Dr. Josef Christl
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List of Abbreviations

Basel II	Revised international capital framework
BWG	Austrian Banking Act
CAPM	Capital-Asset-Pricing-Model
CCF	Credit Conversion Factor
CCO	Chief Credit Officer
CRO	Chief Risk Officer
EAD	Exposure at Default
EVA®	Economic-Value-Added® (registered trademark of Stern, Steward & Co.)
GL	Group leader
HD	Head of department
IRB-approach	Internal ratings-based approach
LGD	Loss Given Default
M	Maturity
PD	Probability of Default
RAPM	Risk adjusted Performance Measure
(RA)RORAC	Risk adjusted Return on Risk adjusted Capital
ROE	Return on Equity
RORAC	Return on Risk adjusted Capital
SMEs	Small and medium-sized enterprises
SPV	Special Purpose Vehicle
SRC	Standard risk cost
VaR	Value at Risk

Credit Approval Process and Credit Risk Management

1 Introduction

This guideline on “Credit Approval Process and Credit Risk Management” is the third volume of the “*Guidelines on Credit Risk Management*” series, a joint publication of the FMA and the OeNB, and aims to fulfill two objectives: First, credit institutions need to be informed more comprehensively with regard to the preparations for Basel II, and second, the guide aims to provide information related to the current surge in the reorganization of these processes and the corresponding organizational structures in many credit institutions. In some of these institutions, the current developments create the need for an overview of tried and tested concepts and methods. This is where this guideline comes in: It aims to offer credit institutions a sample checklist in assessing the current organization of their credit approval processes and credit risk management and to provide them with guidelines for the future design of these processes.

Due to the heterogeneous character of the Austrian credit industry, however, all concepts and methods presented here will not have the same relevance for all credit institutions. In order to present a generally accepted best practice catalog, the choice was made not to include an explicit differentiation by transaction or type of credit institution in this guideline. The Austrian credit institutions are invited to judge for themselves which of the concepts and models shown here are relevant for their respective business activities.

This guideline shows the procedures and methods relating to the credit approval process and credit risk management considered “best practice” by the FMA and the OeNB. Each credit institution can use it as a pool of information from which it can take a piece suitable for its business activities in order to scrutinize its own lending and credit risk management processes and to discover and exploit potential scope for improvement. Each credit institution has to decide for itself to what lengths it can afford to go. To this effect, this guideline in particular offers suggestions concerning the implementation of the “FMA Minimum Standards for Credit Business and Other Business with Counterparty Risk“, which will be provided to the credit industry shortly, but it does not contain mandatory regulations for credit institutions.

The guideline is structured as follows: Chapter 2 shows separate components of the credit approval process and their inherent risks based on the multitude of the individual steps in the process, followed by a look at the methods and processes of credit risk management in chapter 3. Chapter 4 then describes risk assessment and monitoring functions and deals with their integration in bank-wide capital allocation within the organizational structures of the banks. Chapter 5 looks at issues of internal auditing, and a list of references – intentionally kept short – helps the reader find further sources.

Finally, we would like to point out the purely descriptive and informational character of the guideline; it cannot and does not contain any statements on regulatory requirements on credit institutions relating to the credit approval process and credit risk management, and the relevant authorities are in no way prejudiced by this guideline. Any references to draft directives are based on texts current at the time of drawing up the guideline and are for informational purposes only. Despite the highest level of diligence exercised in preparing this guideline, the editors do not assume any liability for its content.

2 Credit Approval Process

2.1 Introduction

The individual steps in the process and their implementation have a considerable impact on the risks associated with credit approval. Therefore, this chapter presents these steps and shows examples of the shapes they can take. However, this cannot mean the presentation of a final model credit approval process, as the characteristics which have to be taken into consideration in planning credit approval processes and which usually stem from the heterogeneity of the products concerned are simply too diverse. That said, it is possible to single out individual process components and show their basic design within a credit approval process optimized in terms of risk and efficiency. Thus, the risk drivers in carrying out a lending and rating process essentially shape the structure of this chapter.

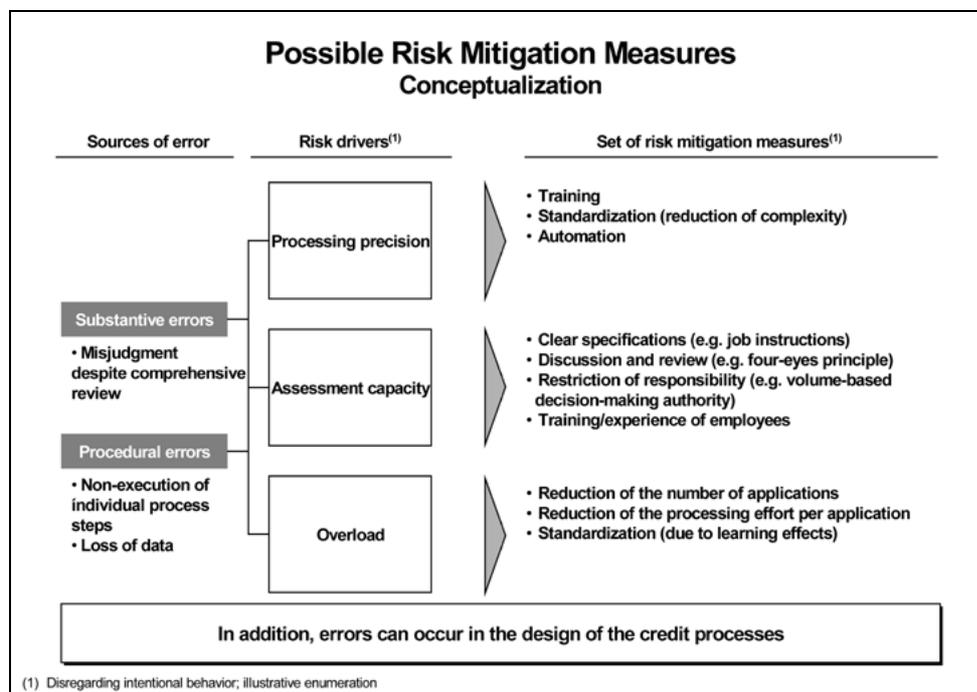
First of all, we need to ask what possible sources of error the credit approval process must be designed to avoid. The errors encountered in practice most often can be put down to these two sources:

- *Substantive errors*: These comprise the erroneous assessment of a credit exposure despite comprehensive and transparent presentation.
- *Procedural errors*: Procedural errors may take one of two forms: On the one hand, the procedural-structural design of the credit approval process itself may be marked by procedural errors. These errors lead to an incomplete or wrong presentation of the credit exposure. On the other hand, procedural errors can result from an incorrect performance of the credit approval process. These are caused by negligent or intentional misconduct by the persons in charge of executing the credit approval process.

In the various instances describing individual steps in the process, this chapter refers to the fundamental logic of error avoidance by adjusting the risk drivers; in doing so, however, it does not always reiterate the explanation as to what sources of error can be reduced or eliminated depending on the way in which they are set up. While credit review, for example, aims to create transparency concerning the risk level of a potential exposure (and thus helps avoid substantive errors), the design of the other process components laid down in the internal guidelines is intended to avoid procedural errors in the credit approval process.

Still, both substantive and procedural errors are usually determined by *the same risk drivers*. Thus, these risk drivers are the starting point to find the optimal design of credit approval processes in terms of risk. Chart 1 shows how banks can apply a variety of measures to minimize their risks.

Chart 1



2.2 Segmentation of Credit Approval Processes

In order to assess the credit risk, it is necessary to take a close look at the borrower's economic and legal situation as well as the relevant environment (e.g. industry, economic growth). The quality of credit approval processes depends on two factors, i.e. a transparent and comprehensive presentation of the risks when granting the loan on the one hand, and an adequate assessment of these risks on the other. Furthermore, the level of efficiency of the credit approval processes is an important rating element. Due to the considerable differences in the nature of various borrowers (e.g. private persons, listed companies, sovereigns, etc.) and the assets to be financed (e.g. residential real estate, production plants, machinery, etc.) as well the large number of products and their complexity, there cannot be a uniform process to assess credit risks. Therefore, it is necessary to differentiate, and this section describes the essential criteria which have to be taken into account in defining this differentiation in terms of risk and efficiency.

2.2.1 Basic Situation

The vast majority of credit institutions serve a number of different customer segments. This segmentation is mostly used to differentiate the services offered and to individualize the respective marketing efforts. As a result, this segmentation is based on customer demands in most cases. Based on its policy, a bank tries to meet the demands of its customers in terms of accessibility and availability, product range and expertise, as well as personal customer service. In practice, linking sales with the risk analysis units is not an issue in many cases at first. The sales organization often determines the process design in the risk analysis units. Thus, the existing variety of segments on the sales side is often

reflected in the structure and process design¹ of the credit analysis units. While classifications in terms of customer segments are, for example, complemented by product-specific segments, there appears to be no uniform model. Given the different sizes of the banks, the lack of volume² of comparable claims in small banks renders such a model inadequate also for reasons of complexity, efficiency, and customer orientation. Irrespective of a bank's size, however, it is essential to ensure a transparent and comprehensive presentation as well as an objective and subjective assessment of the risks involved in lending in all cases. Therefore, the criteria that have to be taken into account in presenting and assessing credit risks determine the design of the credit approval processes.

If the respective criteria result in different forms of segmentation for sales and analysis, this will cause friction when credit exposures are passed on from sales to processing. A risk analysis or credit approval processing unit assigned to a specific sales segment may not be able to handle all products offered in that sales segment properly in terms of risk (e.g. processing residential real estate finance in the risk analysis unit dealing with corporate clients). Such a situation can be prevented by making the interface between sales and processing more flexible, with internal guidelines dealing with the problems mentioned here. Making this interface more flexible to ease potential tension can make sense in terms of risk as well as efficiency.

2.2.2 Accounting for Risk Aspects

The quality of the credit approval process from a risk perspective is determined by the best possible identification and evaluation of the credit risk resulting from a possible exposure. The credit risk can be distributed among four risk components which have found their way into the new Basel Capital Accord (in the following referred to as Basel II).³

- a. Probability of default (PD)
- b. Loss given default (LGD)
- c. Exposure at default (EAD)
- d. Maturity (M)

The most important components in credit approval processes are PD, LGD, and EAD. While maturity (M) is required to calculate the required capital, it plays a minor role in exposure review.⁴

The significance of PD, LGD, and EAD is described in more detail below.

2.2.2.1 Probability of Default

Reviewing a borrower's probability of default is basically done by evaluating the borrower's current and future ability to fulfill its interest and principal repay-

¹ The structural design is covered in chapter 4 of this guide.

² Number of credit applications to be handled.

³ The European Commission adopts a major part of the recommendations of the Basel Committee on Banking Supervision and will present a draft directive to this effect. The resulting EU Directive on Capital Adequacy has to be incorporated into national law by all EU member countries and will thus become legally binding on all credit institutions operating in the EU. In connection with Basel II, this guide will thus frequently refer to this EU draft Directive (Review of capital requirements for banks and investment firms; Commission services third consultation paper; Working document; 1 July 2003), in the following referred to as EU draft Directive.

⁴ The planned term of the exposure has to be taken into account in the credit decision. As it is not subject to a separate review, however, it is not dealt with explicitly within this chapter.

ment obligations. This evaluation has to take into account various characteristics of the borrower (natural or legal person), which should lead to a differentiation of the credit approval processes in accordance with the borrowers served by the bank. Furthermore, it has to be taken into account that – for certain finance transactions – interest and principal repayments should be financed exclusively from the cash flow of the object to be financed without the possibility for recourse to further assets of the borrower. In this case, the credit review must address the viability of the underlying business model, which means that the source of the cash flows required to meet interest and principal repayment obligations has to be included in the review.

2.2.2.2 Loss Given Default

The loss given default is affected by the collateralized portion as well as the cost of selling the collateral. Therefore, the calculated *value* and *type of collateral* also have to be taken into account in designing the credit approval processes.

2.2.2.3 Exposure at Default (EAD)

In the vast majority of the cases described here, the exposure at default corresponds to the amount owed to the bank.⁵ Thus, besides the type of claim, the *amount of the claim* is another important element in the credit approval process.

Thus, four factors should be taken into account in the segmentation of credit approval processes:

1. type of borrower
2. source of cash flows
3. value and type of collateral
4. amount and type of claim

2.2.3 Approaches to the Segmentation of Credit Approval Processes

The following subsections present possible segmentations to include the four factors mentioned above in structuring the credit approval process. The lending business in which banks engage is highly heterogeneous in terms of volume and complexity; this makes it impossible to define an optimal model, and therefore we will not show a model segmentation.

After the description of possible segmentations, two principles are dealt with that have to be included in the differentiation of the credit approval processes along the four risk components to ensure an efficient structure of the credit approval processes.

- distinction between *standard and individual processes* in the various segments;
- taking into account *asset classes under Basel II*

2.2.3.1 Type of Borrower

In general, type of borrower is used as the highest layer in credit approval processes. This is due to the higher priority of reviewing legal and economic conditions within the substantive credit review process. The way in which the eco-

⁵ *The special cases that may occur, for example, in connection with off-balance sheet bank transactions will not be discussed in this chapter.*

conomic situation is assessed greatly depends on the available data. The following segments can be distinguished:

- sovereigns
- other public authorities (e.g. regional governments, local authorities)
- financial services providers (incl. credit institutions)
- corporates
- retail

Usually, at least the segments of corporate and retail customers are differentiated further (e.g. by product category).

2.2.3.2 Source of Cash Flows

The distinction of so-called specialized lending from other forms of corporate finance is based on the fact that the primary, if not the only source of reducing the exposure is the income from the asset being financed, and not so much the unrelated solvency of the company behind it, which operates on a broader basis. Therefore, the credit review has to focus on the asset to be financed and the expected cash flow. In order to account for this situation, the segmentation of the credit approval processes should distinguish between

- credits to corporations, partnerships, or sole proprietors; and
- specialized lending

Credit institutions have to distinguish between the following forms of specialized lending in the calculation of regulatory capital.⁶

1. project finance
2. object finance
3. commodities finance
4. finance of income-producing commercial real estate

This subdivision of Basel II primarily serves to determine the required capital correctly, but it can also prove useful from a procedural point of view. This chapter does not separately address the specific design of credit approval processes in specialized lending transactions. The general procedural provisions that should be heeded to minimize the risk also apply to the forms of finance collectively referred to as “specialized lending”.

2.2.3.3 Value and Type of Collateral

Value and type of collateral have a significant impact on the risk involved in lending. Of particular relevance in this context are those types of collateral which afford the lender a claim in rem on the collateral,⁷ and those product constructions under which the lender has legal and economic ownership of the asset to be financed. Two forms of finance are particularly relevant in practice:

- mortgage finance and
- leasing finance

Mortgage finance and leasing are those forms of finance which often give the lender a substantial degree of control over the asset being financed. The strong legal position resulting from such collateral may warrant special treat-

⁶ The HVCRE (high volatility commercial real estate) which can still be found in the EU draft Directive is no longer considered relevant at the time of printing the guide.

⁷ Other forms of collateral (e.g. guarantees) also represent considerable collateralization. Still, the type of collateral is less important than the type of borrower, so that in practice no segmentation is made in terms of type of collateral.

ment of the relevant forms of finance. Please refer to 2.4.2.4 for a description of the types of collateral usually accepted by banks and the valuation of such collateral.

2.2.3.4 Level of Exposure

The level of exposure has an immediate impact on the exposure at default (EAD). Therefore, any increase in the level of exposure should trigger a more detailed credit review of the respective borrower. This aspect and the risk minimization that can be achieved by standardization and automation are the rationale behind the separation of low-volume and high-volume lending business that can often be found in the way in which credit approval processes are designed. In practice, the ensuing sub-segmentation within the claims segments is now commonly referred to as standard process and individual process.

2.2.3.5 Standard and Individual Processes

The distinction between *standard and individual processes* does not create a separate segment. It is rather a common process differentiation *within claims segments which are defined in accordance with the criteria described above*. In the vast majority of cases, the level of engagement is the decisive element in the differentiation between standard and individual processes. In addition to the level of exposure, it is possible to describe some general differentiating criteria that characterize the process type in question. Generally speaking, the objective of establishing standard processes is more efficient process execution. As most segments show concentrations of certain product specifications, it is possible to develop processes that specifically address these characteristics. *Standard processes* are characterized by the fact that they are only intended and suitable for handling certain credit products with limited features and options. Chart 2 (page 14) shows some commonly found characteristics of the two process types.⁸

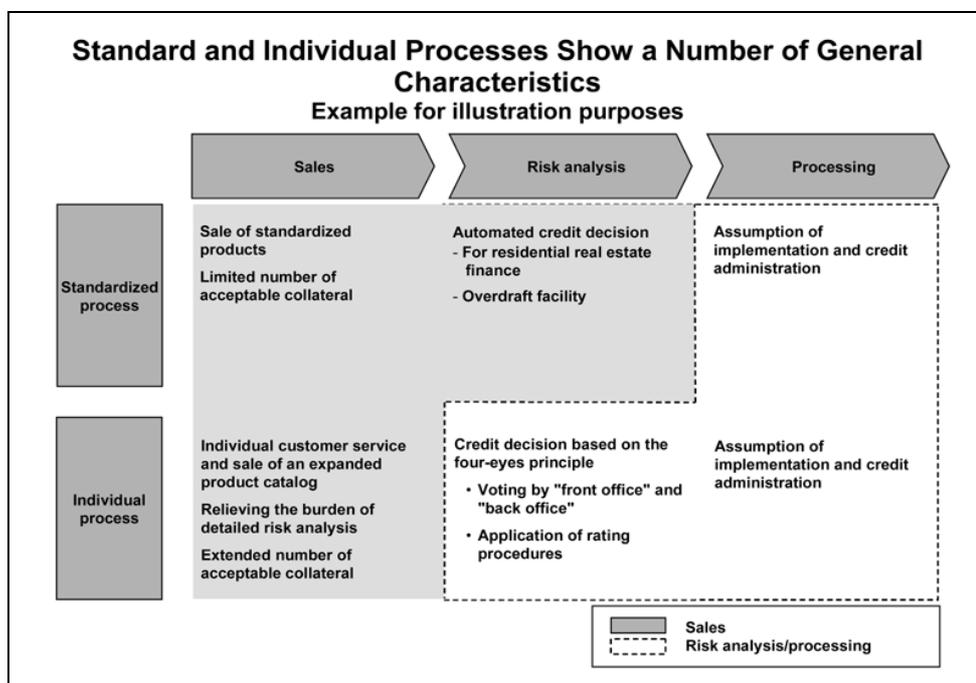
Limiting the process to certain products and maximum exposure volumes allows for simplifications and automations within the process (in particular with regard to credit decisions by vote⁹ and highly automated credit decisions).

Individual processes are characterized by an adaptive design which makes it possible to deal with a variety of products, collateral, and conditions. Typically, this will be required especially for high-volume corporate customer business, as both the borrowers' characteristics to be taken into account in the credit review and the specifics of the products wanted are very heterogeneous. The higher risk involved with loans examined in an individual process should be addressed by using a double vote (one vote by the front office, and one vote by the back office).

⁸ This list does not claim to be exhaustive. Also, it is possible to find a number of processes in practice that are referred to as standard and individual processes but do not show all of the characteristics described in chart 2. The chart only intends to illustrate the rationale behind the differentiation.

⁹ Also see section 2.5.2.

Chart 2



2.2.3.6 Asset Classes under Basel II

As already mentioned above, the new Basel Capital Accord – in its incorporation into European and thus Austrian law – presents mandatory rules for the regulatory capital requirements of claims under any and all banking book transactions¹⁰ of credit institutions and investment firms. Basel II provides two approaches to determine the capital requirement:

1. a standardized approach and
2. an internal ratings-based approach (IRB approach)

The IRB approach¹¹ allows a more risk-sensitive calculation (based on the bank's internal estimates) of the capital required to cover the risks associated with claims than was or will be possible under Basel I and the newly modified standardized approach. The goal is to use the capital required from an economic point of view as the yardstick for the regulatory capital requirement. However, this will only happen if the banks measure the risks in accordance with the regulatory criteria.

The IRB approach distinguishes 7 asset classes:

1. sovereign exposures
2. bank exposures
3. corporate exposures
4. retail exposures
5. equity exposures
6. securitization
7. fixed assets

¹⁰ The new Basel Capital Accord also contains rules for trading book transactions, but these are not specifically addressed in this guide.

¹¹ The further division within the IRB approach into the basic and advanced measurement approaches will not be dealt with further here.

If banks decide to apply the IRB approach in calculating the capital requirements, these asset classes and the respective sub-segments of corporate and retail exposures have to be accounted for in the segmentation process. Thus, it would make sense to harmonize and match the segmentation and the asset classes mentioned above to allow an efficient design of credit approval processes. In most cases, it will be necessary to refine the segmentation further to address a bank's business orientation.

Under Basel II,¹² type of borrower is the only criterion at first (asset classes 1–3), but this changes for retail exposures (asset class 4).

Claims on individuals belong to the retail portfolio. Besides loans to individuals, the retail portfolio can also contain credits to SMEs provided the total exposure of the bank, or more specifically of the credit institution group, vis-à-vis each of these enterprises is less than one million euro. Furthermore, such SMEs must not be treated in the same way as large enterprises within the bank's internal credit (risk) processes. The allocation to the retail asset class is effected by means of the processes most appropriate in terms of business and from a risk perspective.

Finally, retail exposures must also show a sufficient granularity. This means that an individual exposure needs to be part of a large number of exposures which are managed by the bank in the same way.

This differentiation of the retail segment from the other asset classes is highly significant, as Basel II allows a so-called pooling approach in meeting the capital requirements for retail exposures. Under this approach, deriving the risk parameters¹³ is not based on an individual exposure, but on a pool of homogenous exposures. Simplified credit rating processes may be used (only) in this segment.¹⁴

2.2.4 Object of Review and Exposure Management

Credit approval processes are started on behalf of a credit applicant. Especially in the context of lending to corporate customers, it is often necessary to include several (natural or legal) persons in the credit rating process. This will be required if these (natural and legal) persons are to be considered one economic unit and would thus probably have a mutual impact on each other's credit standing. In practice, granting an individual loan often involves a large number of (natural and legal) persons. This has to be borne in mind throughout the entire credit approval process, but particularly in the course of the credit review. Credit approval for groups of companies should be designed in a manner which is specific to the risk involved and efficient and should aim to focus the review on the actual risk-bearer, that (natural or legal) person whose legal and economic situation ultimately determines the ability to fulfill the obligations under the credit agreement. In any case, Basel II requires the assessment of the borrower's credit standing.¹⁵

¹² This refers to the IRB approach, but the standardized approach also shows this dichotomy of segmenting the asset classes by borrower as well as by other characteristics of the exposure.

¹³ See section 2.2.2.

¹⁴ The various data requirements and credit rating processes are shown in the "Rating Models and Validation" guideline.

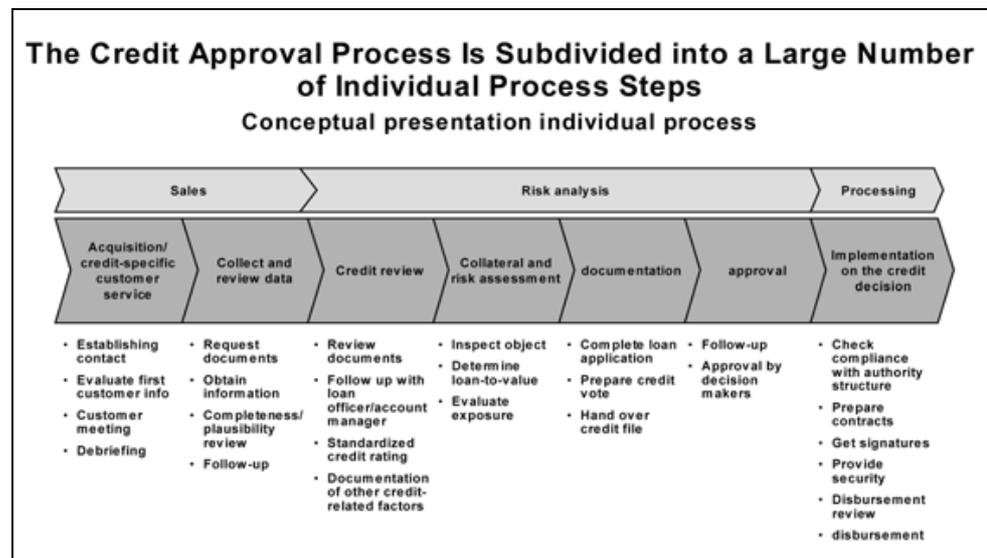
¹⁵ See Annex D-5, 2.1 EU draft Directive.

Especially in complex and far-reaching company networks, the link to the respective credit institution may often go beyond pure sales contacts (e.g. a foreign holding company and a domestic subsidiary). In practice, this often results in vague guidelines in terms of exposure management within credit approval processes. From a risk perspective, the overall risk of the risk-bearer should always be aggregated over the bank as a whole and then presented to the decision makers; the internal guidelines should contain provisions which clearly define the risk-bearer. This classification is usually based on loss-sharing arrangements or legal interdependences. Also, it should be stipulated whether aggregation should be effected by one person in charge (at group level) in processing or risk analysis, or in a decentralized fashion by each unit itself.

2.2.5 Overview of the Credit Approval Process

The order of the following subsections reflects the sequence of steps in the credit approval process, with the credit approval process for new customers serving as the general framework. Credit approval processes for existing customers will be addressed explicitly if they contain process steps that are not found in the credit approval process for new customers at least in a similar form. Chart 3 summarizes the individual process steps:¹⁶

Chart 3



This chapter shows a structured presentation of the criteria which should form the basis for the design of credit approval processes. The definition of exposure segments is an important prerequisite to handle credit approval processes in a manner which is specific to the risk involved and efficient. Many of the risk mitigation measures described here can only take full effect if they account for the specific characteristics of the credit applicants. Therefore, the segmentation of the credit approval processes is a central component of risk mitigation. While the risk mitigation measures should be designed in accordance with the

¹⁶ As has already been mentioned, credit approval processes differ in the segments defined for each case. This presentation should therefore not be considered to be of general validity, with several process steps possibly occurring at the same time.

specifics of each segment, there is a uniform basic structure of these measures which are discussed in the following subchapters. A presentation of the specific design of these measures would only be possible with reference to a detailed definition of the individual segments. Such a definition is impossible due to the great heterogeneity among the banks addressed by this guideline to begin with and can thus only be established for each bank separately. Thus, the following subchapters will primarily discuss the basic structure of the risk mitigation measures and the way in which they work. At some points, the distinction between standard and individual processes is pointed out as this distinction is a central element in the design of credit approval processes nowadays. In case differences in the process design are considered essential for the effectiveness of the risk mitigation measures, this design will be described in more detail.

2.2.6 Integration of Sales and IT in the Process Design

An early integration of sales and IT is an *essential prerequisite* for the success of a reorientation of the credit approval process. In order to facilitate their implementation, changes in processes have to be reflected in the bank's IT structure. The extensive planning and alignment effort involved in IT projects (in particular the coordination the IT interfaces to all organizational units that use data from the credit approval processes) makes it necessary to check at an early stage whether the project is feasible and can be financed.

This depiction of the credit approval processes is highly relevant not only for risk analysis and processing, but has a particular significance for sales. Changes in processes, in particular the introduction of mostly automated credit decisions, entail a considerable change in the user interface in sales applications. Therefore, the success of the implementation is highly dependent on the extent to which employees accept such changes.

2.3 Process Steps Leading up to the Credit Review

The execution of the credit review is based on external and internal data on the credit applicant. Especially for extensive exposures, considerable resources may be tied up in the process of collecting the data, checking the data for completeness and plausibility, and passing on the data to people in charge of handling, analyzing, and processing the exposure within the bank. These steps can also lead to a large number of procedural errors. As the data included form the basis for the credit review, errors in collecting, aggregating, and passing them on are especially relevant also from a risk perspective. The subchapter thus focuses on measures to avoid such procedural errors.

2.3.1 Data Collection

The assessment of a credit applicant's credit standing is based on different data sources and data types in accordance with the type of borrower. In any case, a bank must always be interested in having comprehensive and current data on the economic and personal situation of the borrower.

In order to ensure consistent customer service, the respective account manager will typically *coordinate the gathering of information*. The credit review incorporates not only economic data but also qualitative information concerning the borrower. The account manager should thus include a complete and critical

picture of the borrower. In order to ensure that all the information gathered by the account manager is passed on to the person in charge of the credit review, it would be advisable to prepare standardized and structured *reports on customer visits*. In practice, this has proven effective in directing conversations with customers as desired (function as conversation guide). This procedure ensures that information is gathered in its entirety and in an efficient manner. The layout of the visit reports should be specified for each segment and should be included in the internal guidelines.

To make sure that the *data collected is complete*, mandatory lists showing what data are required should be used. These lists then have to be adapted to the requirements of the credit review process conforming to the type of borrower in each case. In addition to individual borrower data, many cases will require general information on the economic situation of a region or an industry to allow a comprehensive assessment of credit application; here, the bank can make use of external sources. If a bank's credit portfolio shows a focus on certain industries or regions, banks are advised to conduct their own analyses of the economic situation in these fields – this is particularly true if the available external information lacks the necessary detail and/or currency.

With regard to the credit review, it is particularly important to constantly update customer data,¹⁷ and the bank should include according procedures and timeframes in its internal guidelines. In terms of individual processes, it should be ensured that periods should be compared at regular intervals in assessing the exposure. Therefore, the relevant data should be available for at least the previous two, but preferably the last three years.

2.3.2 Plausibility Check and Preliminary Review

Before a credit exposure is subjected to a comprehensive credit review, the employee initially in charge should conduct a plausibility check and preliminary review.

This check should look at the completeness and consistency of the documents filed by the borrower to minimize any process loops and the need for further inquiries with the customer. In addition, sales should carry out an initial substantive check based on a select few relevant criteria. The objectives include the creation of awareness and active assumption of responsibility for credit risk on the part of the sales department.

The preliminary check is especially significant in segments with high rejection rates, as a comprehensive credit review ties up considerable resources in these segments. The preliminary check should prevent exposures which will most likely be rejected from tying up capacities in risk analysis. The resulting reduction in number of cases dealt with by risk analysis allows a more detailed scrutiny of promising exposures and is thus desirable in terms of risk as well as efficiency.

¹⁷ The EU draft Directive on Basel II also requires IRB banks to maintain current data.

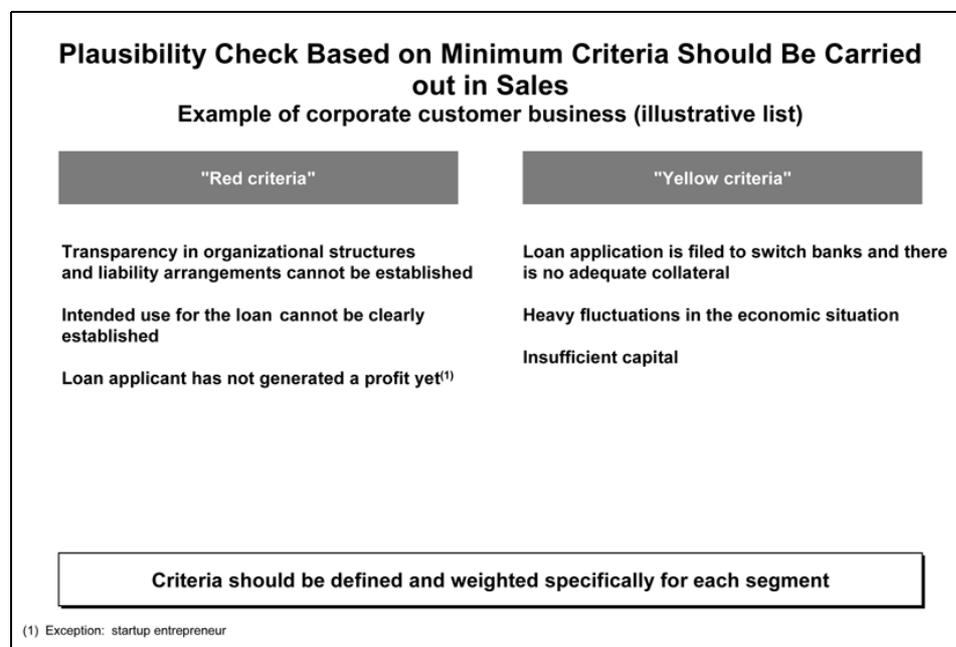
Excursus: Design of the Preliminary Check

In practice, the distinction between two types of check criteria has proven successful:

- “red criteria”, which, if fulfilled, lead to an outright rejection of the exposure (also referred to as knock-out criteria)
- “yellow criteria”, which, if fulfilled, require the sales staff to present a plausible and well-documented justification of the respective situation. If this justification cannot be made, the exposure also has to be rejected.

In terms of efficiency, it may be necessary in certain customer segments not to consider an exposure any further if two or more “yellow criteria” are fulfilled at the same time. These criteria should be laid down in a clear and unambiguous manner in the internal guidelines. Chart 4 shows a sample list of possible criteria.

Chart 4



2.3.3 Passing on Data

Making sure that information is passed on in its entirety is relevant from a risk perspective and concerns those processes in which the credit approval process is not concluded by the account manager himself. If the internal guidelines provide for a transfer of responsibility, or if the credit review is conducted by two or more people, it is necessary to ensure that the complete set of relevant documents is handed over. It would be advisable to prepare *handover reports* for this purpose.

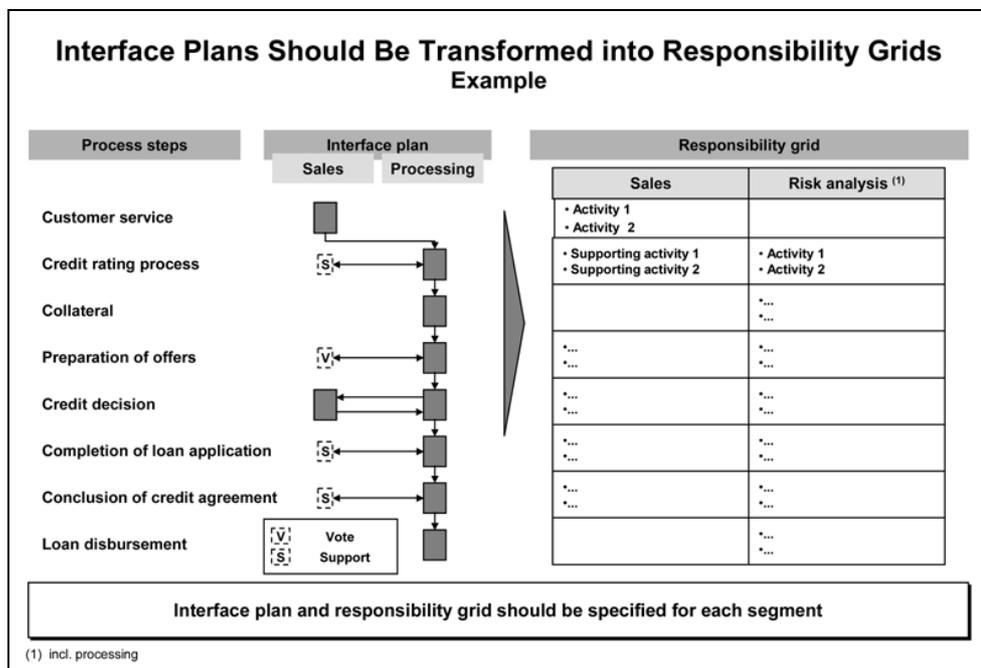
Handover reports should fully reflect changes in responsibility in the course of the credit approval process as well as any interface occurring in the process. In practice, a modular structure has proven particularly effective for such forms. If possible, they should be kept electronically¹⁸ or, alternatively, as the first page of the respective credit folder.

¹⁸ Also see section 2.5.3.

The sales employee has to use the module (table or text module) provided for handing over the exposure to the respective process. This contains, among other things, an enumeration of the documents required for the respective risk analysis segment (“completeness checklist”). On the one hand, this ensures a smooth transfer of the documents, and on the other, it prevents incomplete files from being handed over to risk analysis. In addition, further modules, e.g. notes taken during customer appointments, should be included in the handover reports. Furthermore, appropriate modules should be included for all other interfaces between sales and risk analysis, or between different persons in processing.

To facilitate a consistent application of the handover reports, it would be advisable to prepare detailed interface plans, which should, in particular, show the interfaces between sales and risk analysis. The internal guidelines have to stipulate the responsibilities along the interface plans in detail, which should ensure a consistent application and minimize the procedural risks resulting from the change in responsibility (e.g. loss of documents). Furthermore, this list serves to clearly assign specific responsibilities. This can help avoid errors in the credit approval process that could result from unclear responsibilities (e.g. failure to carry out a required process step). Chart 5 shows a sample interface plan.

Chart 5



2.4 Exposure Assessment: Credit Review and Valuation of Collateral

Exposure assessment involves the credit review and a valuation of the collateral based on the data provided by the credit applicant. These steps aim at making the risks resulting from the exposure transparent and allowing a final assessment of the exposure.

The credit review basically consists of two process components:

1. Standardized models of data evaluation
2. Documentation and evaluation of other credit assessment factors

Credit reviews are increasingly marked by standardized procedures. These procedures support and sometimes even replace the subjective decision making process in assessing credit standing. In practice, we can also find credit review processes that are completely based on standardized and automated models and thus do not provide for any manual documentation and assessment of other credit assessment factors beyond that.

After establishing and assessing the risk involved in lending, the collateral offered by the applicant is examined and evaluated. The collateralized portion does not affect the applicant's probability of default¹⁹; and its impact on assessing the exposure thus has to be dealt with independently of the credit review.

2.4.1 Standardized Models of Data Evaluation (Rating Models)

Today, we have many different models for the standardized evaluation of credit assessment data. These models can basically be divided into *heuristic models*, *empirical statistical models*, and *causal models*.²⁰ In addition, *hybrid models* are used in practice that are based on two or three of the models mentioned.

Heuristic models attempt to take experiences and use them as a basis to methodically gain new insights. These experiences can stem from

- conjectured business interrelationships,
- subjective practical experiences and observations,
- business theories related to specific aspects.

In terms of credit review, this means that experience from the lending business is used to try to predict a borrower's future credit standing. Heuristic models thus depend on the fact that the subjective experiences of the credit experts are reflected appropriately. Thus, not only the credit assessment factors are determined heuristically, but also their impact and their weighting with reference to the final decision are based on subjective experiences.

Empirical statistical models, by contrast, try to assess a borrower's credit standing on the basis of objectifying processes. For this purpose, certain credit review criteria of the exposure under review are compared to the existing database which was established empirically. This comparison makes it possible to classify the credit exposure. The goodness of fit of an empirical statistical model depends to a great extent on the quality of the database used in developing the system. First, the database must be sufficiently large to allow significant findings. In addition, it must be ensured that the data used also represent the credit institution's future business adequately.

Causal models derive direct analytical Links to creditworthiness on the basis of finance theory. They do not use statistical methods to test hypotheses on an empirical basis.

Hybrid models try to combine the advantages of several systems. Empirical statistical models are used only for those assessment factors for which a database exists which is sufficient in terms of quality. The other credit assessment factors

¹⁹ With the exception of personal collateral such as guarantees.

²⁰ For a detailed description, please refer to the guide on "Rating Models and Validation".

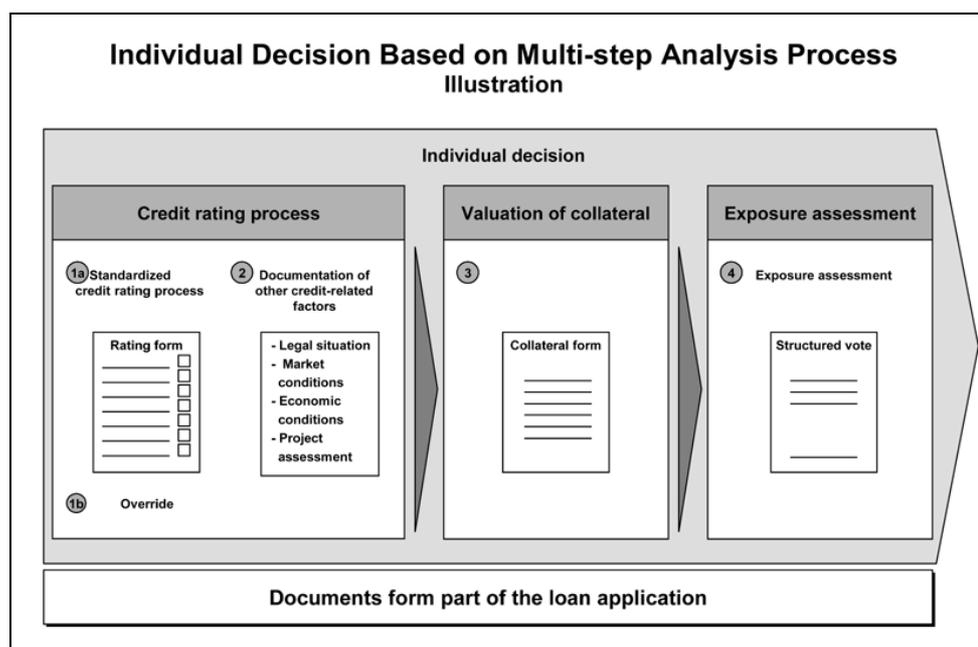
which have to be included in the model are assessed by means of heuristic systems, while causal analysis models are typically not used.

The following subsections deal with the integration of these models in credit decision processes. The basic distinction made here is whether further steps are carried out in addition to the standardized data evaluation to assess the credit standing (*individual decision*), or whether the standardized data evaluation essentially forms the basis for a credit decision (*mostly automated decision*).

2.4.2 Individual Decision

In an individual decision, the standardized data evaluation is complemented by further process steps to assess the credit standing. After the credit review, the collateral is evaluated. An integrated look at the detailed results leads to an individual credit decision which is not directly contingent on the results of the individual process components. Chart 6 summarizes the process components.

Chart 6



2.4.2.1 Standardized Credit Review (Rating)

A typical rating process consists of two components:

1. financial rating (or quantitative rating)
2. qualitative rating

Financial rating comprises an analysis of the financial data available for the credit applicant. The analysis of annual financial statements (backward-looking approach) has a central position in this context. Increasingly, however, the analysis of business planning (forward-looking approach) is being employed in the credit review process. Usually, automated programs are used to calculate indicators from the annual financial statements or the business plan.

In most cases, the financial rating is carried out by credit analysts that are not related to sales in terms of organizational structure. The degree of specialization

of these employees depends on the volume and the complexity of each bank's business activities.

In the conventional corporate customer business²¹ most elements of the financial rating are carried out by specialized employees. There may be additional specialized units that furnish those employees which are primarily responsible with certain analyses (modular system). In many banks, for example, it is possible to find units specializing in the analysis of foreign companies or real estate finance. Setting up a separate unit should be considered whenever the analysis requires the development of special know-how and the number of the analyses to be handled renders a complete specialization of employees feasible in terms of efficiency.

If analyses that were drawn up by employees other than those primarily responsible for the credit approval process, it is essential to make sure that the administrative process involved is as efficient as possible. There should be a general guideline stipulating that the analysis is confirmed by the person in charge of the organizational unit supplying the module for the credit analysis when this module is handed over to the credit officer managing the exposure. The common practice of having the people in charge of every single organizational unit involved in the credit approval process also confirm the completed credit application is rejected as inefficient and does not seem necessary in terms of risk, either.

In contrast to financial rating, which requires specific technical know-how, qualitative rating requires comprehensive knowledge of the borrower to be successful. In the course of the rating, the qualitative factors are also evaluated in a standardized fashion by means of one of the models described above.

Accordingly, this is typically done by the sales employee. As qualitative rating may be interested in characteristics that go beyond the borrower in question itself (e.g. product positioning within the competitive environment), it is possible to provide for the integration of additional organizational units within the bank. This could, for example, be units specializing in the evaluation of product markets. What was said above also applies to the inclusion of these modules.

Using a weighting function, financial and qualitative ratings are combined, with the result usually referred to as *base rating*.

In addition to the process components discussed so far, it is possible to include further information in the credit rating process. In particular, this comprises a bank's internal information on the respective applicant's conduct in the past (e.g. overdrafts) as well as additional information concerning the industry in which the company operates. In practice, the result is often referred to as *company rating*.

If companies are affiliated, it is necessary to look at possible loss-sharing arrangements in the rating process. The inclusion of loss-sharing arrangements makes it possible to determine the risk-bearing entities. The inclusion of a loss-sharing arrangement can affect the assessment of the probability of default of the company on which the rating is based positively and negatively.

²¹ This includes any corporate customer transaction with the exception of specialized lending. For specialized lending constructions, it is common to employ units adjusted to the various forms of these constructions. It is not possible to take a closer look at these processes in this chapter, but usually these processes involve a close cooperation of sales and processing employees within a team solution.

- Positive effect: assumption of support for the company in case of a crisis
- Negative effect: spillover of a crisis to the company

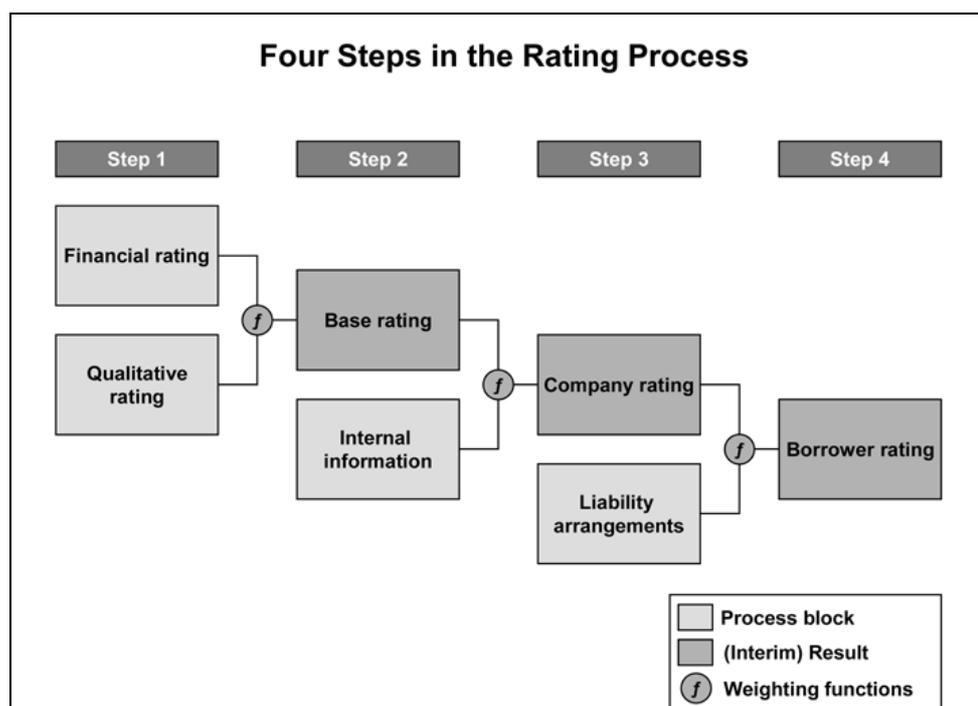
The inclusion of loss-sharing arrangements should be done in accordance with the relevant members of the sales and credit analysis departments.²²

This typically marks the end of the rating process. The final result is also referred to as *borrower rating*.

The final borrower rating should be awarded and confirmed together by the sales and risk analysis employees primarily in charge of the exposure.²³ The employees should carry out mutual plausibility checks. In addition, external ratings should also be used in the plausibility check. If it is not possible to come to an agreement, the managers in charge look at the exposure, but the final decision should not be left in the hands of the front office. The need for a formal arrangement is underscored by the significance which will be attributed to the rating under the IRB approach in the future.²⁴

Chart 7 illustrates the process components of a typical rating process.

Chart 7



2.4.2.2 Overriding Rating Results

The internal guidelines should contain rules governing the circumstances under which it is permissible to interfere manually in the standardized credit rating models.²⁵ This might, for example, be necessary in the course of a financial rating if a meaningful ratio analysis is precluded due to a special structure of the enterprise to be examined. Any changes made must be subject to strict documentation requirements to ensure complete transparency of the process. The

²² Also see section 2.2.4.

²³ See Annex D-5, 2.2 EU draft Directive.

²⁴ Needed to calculate the probability of default (PD) under Basel II.

²⁵ This is also in line with the requirements of Basel II.

authority to do so must be stipulated in the decision-making structure. Furthermore, the number of overrides represents an indicator of the reliability of the credit rating processes. Therefore, the documentation is also required for validation purposes.

2.4.2.3 Documentation of Other Credit Assessment Factors

In addition to the factors evaluated by means of the standardized credit rating process, the employees handling the exposure could include further data/factors in the credit review.²⁶ The need to offer at least the option to add a description and evaluation of the exposure results from the fact that the standardization of the credit rating process makes it necessary to limit the extent to which all existing credit assessment factors are presented. Ideally, the processes should adequately reflect all factors necessary to assess the credit standing, and the need for a separate description should arise only as an exception.

The description and assessment of these factors should be carried out in accordance with clear rules in the internal guidelines. In practice, the credit applications show fields that help document these factors. Five categories are usually distinguished:

1. legal situation
2. market situation
3. economic situation
4. project evaluation
5. debt service capacity

The documentation of the factors to be considered in these categories should contain clear and unambiguous statements describing their potential impact on credit standing. The design of the forms should already be apt to prevent or reduce longwinded descriptions of the factors and unclear assessments with regard to the impact on credit standing. This can be achieved by using standardized text modules and limited field sizes.

2.4.2.4 Valuation of Collateral

The valuation of the collateral provided by the credit applicant is an essential element in the credit approval process and thus has an impact on the overall assessment of the credit risk involved in a possible exposure. The main feature of a collateralized credit is not only the borrower's personal credit standing, which basically determines the probability of default (PD), but the collateral which the lender can realize in case the customer defaults and which thus determines the bank's loss. Via the risk component of loss given default (LGD) and other requirements concerning credit risk mitigation techniques, the value of the collateral is included in calculating the capital requirement under Basel II.

In order to calculate the risk parameters under Basel II correctly, it is important for the valuation of the collateral to be effected completely independently of the calculation of the borrower's PD in the credit rating process.²⁷ This

²⁶ Several criteria that are already evaluated in the course of the rating process may sometimes require further clarification in the credit file. This makes it possible or easier to understand individual decisions in the course of the rating process.

²⁷ The specialized lending segment does not allow a clear distinction. One example would be commercial real estate, where a strong positive correlation exists between repayment of the facility and the realization proceeds in the case of default, as both elements primarily depend on the cash flows generated by the financed property.

should ensure that the probability of default and the loss given default are shown separately in order to meet the Basel requirements of splitting up the review into a customer rating which reflects only the PD on the one hand, and a transaction valuation which also contains a valuation of the collateral to support the credit decision on the other.

Collateral is generally divided into personal and physical collateral.

In the case of *personal collateral*, the provider is basically liable with his entire fortune. Examples of personal collateral are the following:

- a. suretyship
- b. guarantee and letter of support
- c. collateral promise

In the case of *physical collateral*, the bank receives a specific security interest in certain assets of the borrower or the collateral provider. Examples of physical collateral are the following:

- a. mortgage
- b. pledge of movable assets (on securities, goods, bills of exchange)
- c. security assignment
- d. retention of title

The internal guidelines (collateral catalog) should lay down the type of collateral which each bank generally accepts.²⁸ Banks should take a close look at that collateral whose value is subject to particularly strong fluctuations and/or whose realization is longwinded or often cumbersome. Liens, for example, usually pose relatively few problems for their holders and provide them with a rather strong creditor position, as the related value of the collateral given is generally easier to assess/value than the personal liability fund of a guarantor.

The collateral catalog has to include appropriate instructions on assessing the collateral potentially accepted by the bank as well as determining its collateral value. A description of the processes and principles in determining the collateral value for each type of collateral will primarily have to be drawn up in accordance with the business orientation of each bank and the complexity of the approved collateral. General principles governing the valuation of collateral such as accounting for sustainable value or valuing the collateral based on the liquidation principle should be included in the determination of collateral value; similarly, it should also include general risk deductions (haircuts) as well as deductions for procedural cost (e.g. long time required to sell the collateral). This allows a more accurate estimate of the potential realization proceeds.

What all forms of collateral have in common, though, is that while the application of credit risk mitigation techniques reduces credit risks, it also creates new risks for the bank.²⁹ In particular, it will be up to each bank's capabilities to identify and measure the risk involved with a collateral in order to derive an objective assessment of the total risk inherent to a secured exposure. Among other measures, Basel II takes this into account by stipulating special requirements concerning the way in which collateral arrangements can be enforced and realized. Furthermore, the new Capital Accord requires the use of sound procedures and processes to control and monitor these risks. This should be

²⁸ In addition, this could be specified for each segment to increase efficiency.

²⁹ For example legal and operational risks, market price risks, concentration risks, etc.

achieved by establishing collateral management in line with business volume which uses computer-aided processes (collateral database, valuation).

What still has to be noted is that, as a rule, the valuation of collateral should be carried out by specialized employees and possibly in separate organizational units which do not belong to the front office, or by external providers (e.g. real estate appraisers).³⁰

2.4.2.5 Exposure Assessment

After reviewing borrower rating, other credit assessment factors, and the collateral, it is possible to assess the borrower's creditworthiness with regard to the proposed exposure. The final assessment of the exposure risk can only be made (especially in the corporate customer business) after a comprehensive evaluation of all sub-processes of credit review. The results of the valuation of the collateral will also be included in this assessment which has to be made by the employees handling the exposure. The credit form should thus provide appropriate fields. Here, it is important to make sure that the internal guidelines contain clear rules on the level of detail and the form in which the explanation has to be presented. In practice, it has proven useful to compare the positive and negative assessment criteria. In addition, the form should provide a field for a concluding summary. Here, too, the use of text modules appears appropriate to avoid long-winded and vague statements. The assessment of the employees in charge of processing the exposure is the basis for the subsequent credit decision. This must be done in line with the decision-making structure for the credit decision stipulated in the internal guidelines.³¹

2.4.3 Automated Decision

The standardized retail business in particular does mostly without individual interventions in the credit decision process, with the result of the standardized credit rating process being the major basis for the credit decision.

As these processes are used only for small credit volumes, the data are often entered by a sales employee. Deviations can be found mostly in residential real estate finance, as it is possible to set up specialized risk analysis units for this usually highly standardized process. In both cases, the credit decision can be made by a single vote up to a volume to be defined in the internal guidelines in order to curb the complexity and thus increase the efficiency of the process.

Increasingly, mostly automated decision processes are also used in the small business segment. The prerequisite is a clear definition of and the data to be maintained for this customer segment. This makes it possible to create the conditions to derive a discriminatory analysis function.

In some cases, it is left to the credit applicant to enter the data necessary to carry out the credit review (so-called online applications). However, the limited database and lack of more personal contact with the credit applicant limit the application of this option. The most important success factor in the use of mostly automated processes is the bank's ability to take precautions against the credit applicant entering wrong data or to identify such wrong entries in time.

³⁰ Also see section 4.3.3.

³¹ For a detailed discussion, see section 2.5.2.

Excursus: Taking into Account Basel II

in Choosing a Process

As the IRB approach provides for a calculation of the regulatory capital requirement on the basis of credit standing, the credit rating process has to be adapted to the requirements of the IRB approach.

The application of the formulas to calculate the regulatory capital requirement stipulated in the IRB approach under Basel II requires banks to derive the default parameters needed to quantify the risk. Both the basic approach and the advanced IRB approach require the calculation of the probability of default (PD) of a claim/a pool of claims. Therefore, the credit rating of individual exposures has an immediate impact on the capital requirement. The probability of default of retail exposures can be determined on the basis of pools of claims which combine a number of comparable individual exposures. Thus, it is not necessary to classify every single borrower into different categories.

Under Basel II, it is possible – under certain circumstances – to treat corporate exposures with a total volume of no more than 1m as retail exposures. Based on what has been said so far, it would theoretically also be possible to assess such exposures by using a mostly automated credit decision process (at least from a perspective of compatibility of the credit rating process with the calculation of the capital requirement). In practice, this will have to be qualified for two major reasons:

1. The profitability of the small business segment is highly dependent on the price structure. This, in turn, is one of the decisive competitive factors. Therefore, it is necessary to delineate the risk associated with an exposure as precisely as possible to be able to set a price commensurate with the risk involved.
2. Homogeneous data pools are required for the application of empirical statistical models. In practice, the borrowers in the small business segment show a high degree of heterogeneity, which means that this requirement can only be met by setting up many, thus smaller pools of claims. The decreasing size of pools of claims and the resulting increase in the processes to be applied thus effectively limit the application of this method. This is especially true for small institutions.

2.5 Preparation of Offers, Credit Decision, and Documentation

After reviewing and determining the applicant's creditworthiness in the course of assessing the exposure, the process leading up to disbursement of the credit can be initiated. Thus, this chapter covers all aspects ranging from preparing an offer to actually disbursing the amount stipulated in the credit agreement. With some restrictions, what was said in section 2.4 also applies to the individual process steps in this context. These steps are basically designed in a way as to prevent procedural errors in the credit approval process. Therefore, this chapter focuses on the risk-mitigating design of selected process components.

2.5.1 Preparation of Offers

When preparing a firm offer,³² costing this offer plays a central role. From a procedural point of view, special emphasis has to be placed on clearly defining the authority to set conditions and the coordination process between sales and risk analysis.

³² Prior to this, an offer without engagement is usually submitted by sales in the course of preliminary customer talks. This also includes preliminary terms and conditions.

2.5.1.1 Authority to Set Conditions

The internal guidelines have to lay down the responsibility for the final decision concerning conditions. If a calculation of the conditions in line with the risk involved is carried out by automated systems, sales can have the sole authority to set conditions. The sales department is fully responsible for earnings and should thus have the authority to decide on the conditions. If the systems do not allow a precise calculation of the risk-adequate conditions, the person in charge of risk analysis should be included in the final decision on the conditions. The internal guidelines should contain specific instructions governing the assignment of responsibility for this case. This entails an explicit definition of the escalation criteria. These should be identical for sales and risk analysis. This helps avoid situations in which people at different hierarchical levels have to decide on conditions of an individual exposure. If this is not done properly, such a hierarchical relation (even if it only exists indirectly) may have a negative impact on the required balance in forming an opinion. One of the prerequisites for the identical design of the authority to set conditions, viz. the congruent design of the sales and the risk analysis organization, is dealt with separately in chapter 4.

The target conditions established after determining the risk in the process of calculating the offer are usually only a reference value for the actual conditions concerning interest and principal repayment obligations. In most cases, policy issues are cited as reasons for deviations. If this argument is not substantiated in a detailed and transparent manner, a deviation from the conditions determined has to be rejected.

The *definition of conditions to match the risk involved* on the basis of the credit risk determined in the course of exposure assessment has two overriding goals:

- ensuring a sustainable profitability of a bank's lending business, and thus its stability, and
- motivating borrowers to act in a risk-conscious manner.

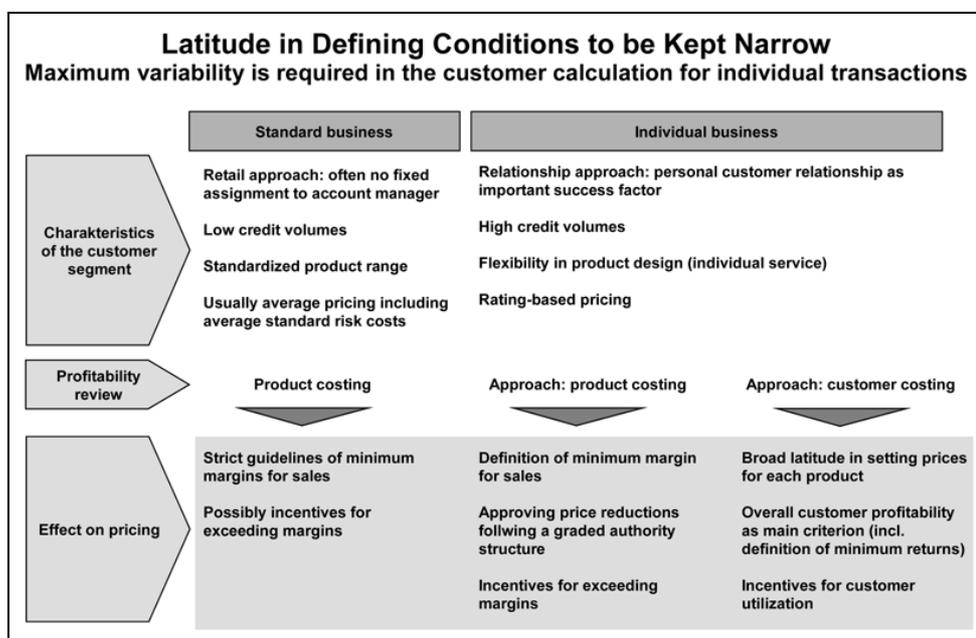
Both goals are of high and long-term relevance. As the incentive systems for the employees involved in the credit approval process are often based on objectives targeted at the very short term (e.g. credit volumes), it is essential to stipulate clear guidelines to limit the risks arising from this conflict of goals. These guidelines should take into account, however, that a bank's business potential might be severely restricted if the latitude in modifying conditions is defined too narrowly or too rigidly. In practice, this latitude in terms of setting conditions will increase in line with the level of authority. Actually including the person in charge in the factual process of setting the conditions ensures that the safeguard intended by assigning different levels of authority to set conditions is not simply replaced by rubberstamping the negotiations at the level of the account manager. In addition, the principle of setting conditions in line with the risk involved has to be complemented by minimum conditions to be specified in the internal guidelines. This helps prevent an arrangement between borrower and bank which would blatantly violate the principle of defining conditions commensurate with risk.

Deviations may be acceptable for those customer segments in which the credit business is only regarded as part of a more comprehensive customer relationship. In practice, the conscious decision is often made to forgo interest

income from loans commensurate with the risk involved to generate profits from other transaction with the customer in question (*cross-selling*). The basis for setting the conditions here is not the product costing, but a comprehensive customer costing, with total customer profitability being the main objective. From a risk perspective, it has to be ensured that the bank maintains systems suitable for recording customer profitability that also reflect the risks associated with individual transactions properly. If this condition is not met, the individual transactions and products should also be costed in line with the risk involved.

Chart 8 shows a possible form of variability of conditions distinguishing between standard transactions and individual transactions. The effective structure of the authority to set conditions is often set up in connection with the authority to make credit decisions. What is said about the decision-making structure also applies to the authority to set condition.

Chart 8



2.5.2 Credit Decision – Decision-making Structure

If a set-up of the specific credit exposure was agreed upon in the course of preparing the offer, this is followed by a formal internal approval of the individual exposure as part of the credit approval process. The essential risk-related issue of this process step is the definition of credit authority, particularly with regard to the coordination of sales and risk analysis.

Credit authority describes the authorization granted by the management to use discretion in making credit decisions up to a certain amount. In order to comply with the “four-eyes principle”, this authority can – as a rule – only be exercised jointly by two or more decision makers. Moreover, a credit decision should always involve people that do not belong to the sales department (double vote). In addition, the level of authority should be commensurate with the experience of the employees in charge of assessing the credit exposure.

Looking at decision-making authority, we will now discuss an idealized decision-making structure. Special emphasis is placed on the determining factors to allow an adaptation to different business models.

2.5.2.1 Single and Double Vote Requirement

Entrusting the credit decision to persons from two unlinked departments is a major tool to prevent risks associated with granting loans. The hierarchical decision level should be identical for the sales and risk analysis departments.

Like the assignment of different levels of decision authority, the introduction of double vote requirements helps avoid or mitigate the occurrence of substantive and procedural errors in the course of the credit approval process. Furthermore, double vote requirements are especially suitable for imposing an immediate *check* on personally motivated decisions of a single person. Their significance in the context of risk mitigation should become apparent from the design of the credit approval processes. Thus, the *double vote* should apply as the *basic principle* for decisions concerning credit approval. For efficiency reasons, the effort involved in introducing double vote requirements has to be weighed against the risk costs that are prevented as a result. Typically, a single vote will only be applied to low-volume loans on the basis of standardized products in the retail and corporate segment (small businesses and independent professionals). Here, too, the “four-eyes principle” should be used.

Finally, we would like to point out models showing a differentiated layout of the decision-making structure (bypassing hierarchical layers) and briefly discuss their significance. These models can have a considerable positive impact on the individual’s responsibility concerning the assumption of the risk associated with the credit approval (by preventing the responsibility being “socialized”) as well on the time available to carry out appropriate credit analyses (by reducing the number of cases).

2.5.2.2 Basic Guidelines Covering the Creation of a Decision-making Structure

After looking at the risk level of the pending decision, the structure should be subdivided based on the nature of the object of the decision. Three categories are usually formed here:

1. non-standardized credits
2. standardized credits
3. short-term overdrafts (all instances in which credit lines are exceeded in the short term)

In addition, the decision-making structure may contain specific rules on further issues (e.g., authority to set conditions, minor changes within an exposure).

From a conceptual point of view, it makes sense to refer to the credit risk associated with the individual exposures when drawing up the decision-making structure for *non-standardized credits*. As already outlined in section 2.2.2, the most important components in assessing the credit risk are probability of default (PD), loss given default (LGD), and exposure at default (EAD). Accordingly, the factors to be taken into account in drawing up the decision-making structure are the following:

1. level of exposure
2. value of collateral
3. type of borrower
4. probability of default

In contrast to structuring credit approval processes, which have to be set up in accordance with the differing conditions in terms of assessing the risk-related facts, the criteria in this context should be weighted based on the absolute risk level of the exposure. Therefore, the *level of exposure* plays a decisive role in stipulating the decision-making structure. This is reflected in the fact that in most cases, the different levels of authority are defined by the level of exposure.

The *value of the collateral* restricts the unsecured portion of the exposure and is therefore also of great significance. In most cases, the “translation” of this criterion is effected by showing separately the maximum unsecured volume within the scope of a level of authority.³³ The type of collateral, however, is not a significant structural element in this context. As has already been mentioned on various occasions, the different levels of authority in the decision-making structure and the double vote requirements serve to avoid or reduce formal and substantive errors in the credit rating process. The type of collateral does not have a direct impact here.

Compared to the abovementioned factors, the *type of borrower* is a subordinate criterion in terms of laying down the decision-making structure. Still, the decision-making structure provides for subdivisions to this effect. Worth mentioning here are credits to banks (interbank finance) and to sovereigns, which are different from loans to corporate and private customers already because of the high volumes involved. As a result, the volumes used to define the levels of authority have to be determined separately.³⁴

The *probability of default* can also be used in defining the decision-making structure, but it is usually only a subsidiary feature. The customer rating is usually taken as an indicator of the PD in this case. A decision-making structure may stipulate that decisions on exposures with particularly good or particularly bad ratings have to be made by employees of, thus, a lower or higher hierarchical level than for exposures assessed to be average.

Standardized credits should be shown separately as the degree of standardization has a significant influence of the occurrence of procedural and substantive errors in the course of the credit approval process. Standardization can help reduce both sources of errors considerably. On the one hand, the shorter and usually rigid process structure allows less procedural errors to be made, and on the other, the credit rating processes applicable to standardized credits make it possible to assess the credit standing based on empirical statistical analyses and thus independently of the subjective evaluation of a credit officer or account manager.³⁵

³³ This distinction is only relevant for those transactions in which collateral plays a major role in the credit approval process. Thus, for example, this distinction is not required in the case of interbank finance.

³⁴ This requires that either the risk is assessed to be lower for this type of credit than is the case for loans to corporate or retail customers, or that the employees in charge of deciding such exposures are more experienced than their colleagues handling loans to corporate or private customers.

³⁵ Also see section 2.4.2.5.

From a risk perspective, far-reaching standardization may render double vote requirements unnecessary.³⁶ In deciding what transactions are subject to a single vote requirement, special emphasis will have to be placed on the following factors:

- product and
- volume

The differentiating criterion of “standardization” typically applies to products. The products have to be designed in a uniform manner as far as possible. One example in this context is the rigid definition of the product conditions, with the subjective element of setting conditions having to be taken into account. Thus, a definition of conditions tied to the volume of the credit or the credit rating does not rule out the element of standardization. Considerable latitude for the account manager in terms of setting conditions, however, would imply that there is no standardization.

If possible country risks were already accounted for in the course of determining the rating, such a differentiation is not required in the decision-making structure; if this was not the case, such a subdivision has to be set up also for country risks.

Short-term overdrafts can be shown in a separate decision matrix, to increase process efficiency. This separate matrix does not necessarily have an impact on the conceptual design of the decision matrix, as only the volumes defining the levels of authority differ from those for non-standardized credits. Here, it is essential to clearly limit amounts as well as the maximum overdraft period allowed to avoid a quasi-permanent lending situation as a result of overdrafts. Permanent overdrafts have to be approved by the person in charge within the framework of a complete credit approval process.

2.5.2.3 Delineation of the Levels of Authority

Due to the huge differences between the banks, there is no point in specifying volume-based thresholds to define the levels of authority here. Nor does it make sense to offer indicative values, as this would require a precise definition of the underlying business model and the number of transactions. Therefore, we will again focus on the criteria relevant for determining the thresholds.

In contrast to assigning authority to employees ultimately based on trust and the experience of the employee in the credit business, the definition of the levels of authority can be effected on the basis of a system which can be derived in a logically consistent manner. The constraining factor in this context is the employee capacity available to make credit decisions. First of all, the pool of the most experienced employees should be fully exhausted, being assigned the exposures with the highest risk level. The same method has to be used as long as different employee pools can be formed on the basis of their qualification to evaluate credit decisions.

In practice, the authority to make credit decisions is usually linked to the hierarchical level in the organizational structure to simplify matters. Normally, however, this procedure should be equivalent also in terms of employee qual-

³⁶ A final check for correctness, completeness, and the compliance with requirements should also be carried out in these cases in the course of a credit (disbursement) check.

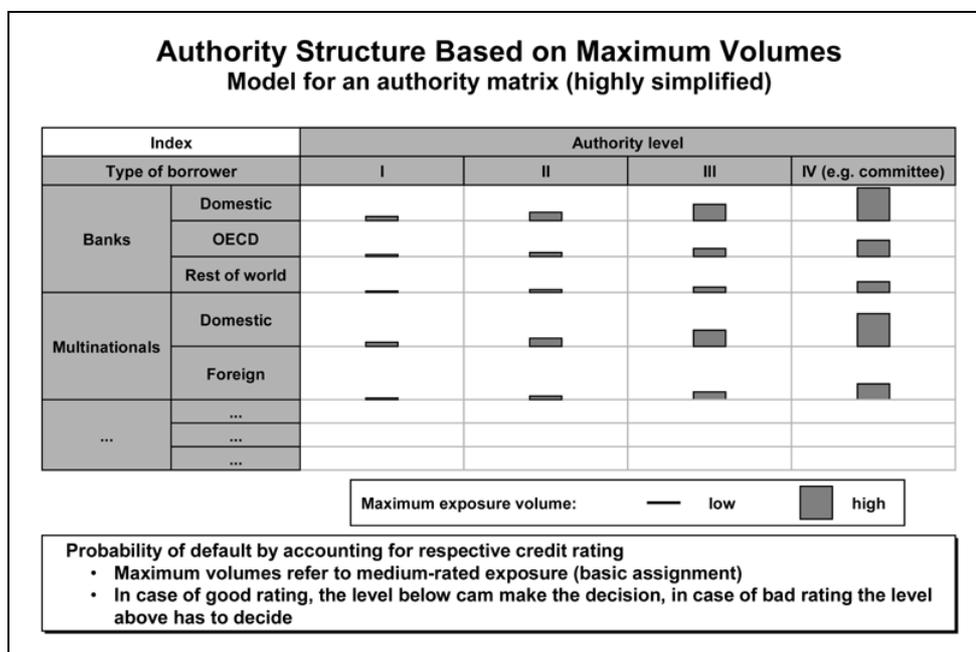
ification. It has to be borne in mind, however, that such a procedure creates a dependence between the decision-making structure with its underlying number of credit decisions and the bank's organizational structure. It is particularly important to make sure that changes in the organizational structure do not lead to a backlog of credit decisions at a hierarchical level if the originally available capacity there is reduced as a result of such changes. It would, of course, also be possible to solve this problem by adapting the decision-making structure. Individual employees, for example, might be endowed with the decision-making authority of their respective managers. From a risk perspective, it needs to be ensured that no backlog of credit decisions occurs that would result in a limited capacity to examine the risk level of the individual exposures.

2.5.2.4 Executive Authority and Credit Committees

As a rule, company law does not restrain the authority of the entire executive board, but such restraints may exist under the Banking Act and for factual reasons.³⁷ The legal explanation is that the absence of a stipulation in the bylaws is deemed to mean joint representation. This is definitely true for the authority to make decisions. In order to balance the interests of authorized representatives and owners, the decision-making structure provides for the consent of more than one executive or the involvement of owner representatives for exposures exceeding a certain volume to be defined.

Chart 9 shows a sample decision matrix.

Chart 9



³⁷ On the one hand, such limits can be prescribed in the Banking Act, e.g. under the provision of restrictions on large exposures, and on the other, the available equity capital can impose a natural limit.

2.5.2.5 Other Possible Stipulations of Decision-making Structures

The decision-making structure can stipulate further decision-making powers in connection with granting loans or questions that arise during the term of the credit (e.g. deviation from standard conditions).

In general, *deviations from standard conditions* are differentiated in accordance with their extent. In practice, three differentiating levels are typically applied:

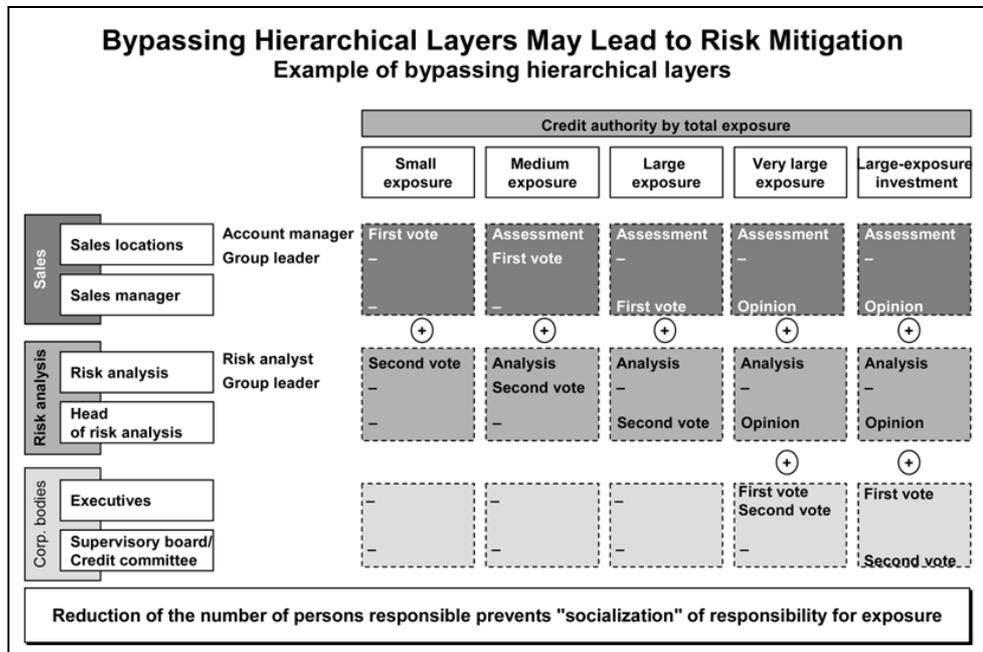
- deviation of less than 25%
- deviation between 25% and 50%
- deviation of more than 50 %

The decision-making structure has to stipulate the decision-making authority accordingly.

2.5.2.6 Bypassing Hierarchical Layers

In order to ensure that the credit decision is made by the persons in charge under the decision-making structure not only formally but also effectively, responsibilities must be defined clearly and in a transparent manner. Besides a substantive check of the suggested decision, this assessment also requires a check of the compliance with procedural rules. In practice, however, it shows that the decisions of the persons actually in charge have sometimes become mere formalities, especially if an exposure has to be handed up several hierarchical layers. The idea behind handing up an exposure one level at a time to the person actually in charge is to detect substantive or formal errors already at an early stage and thus to reduce the workload of the person in charge. This is not achieved if the exposure is simply passed on. Moreover, simply passing on the exposure leads to another effect that increases the risk. Involving a number of people inevitably leads to a “*socialization of responsibility*”. This denotes the effect that the involvement of many persons reduces the responsibility of each individual person. Under an extreme scenario, this may cause the failure to carry out a diligent credit review on the part of the credit officer, as that person erroneously assumes that his superior and, ultimately, the person in charge have actually assessed the exposure. This effect can be avoided by introducing the possibility of bypassing hierarchical layers. This possibility provides for the credit file to be handed over from the credit officer dealing with the application directly to the person in charge, even if that person is two or more layers above him. Chart 10 shows an example.

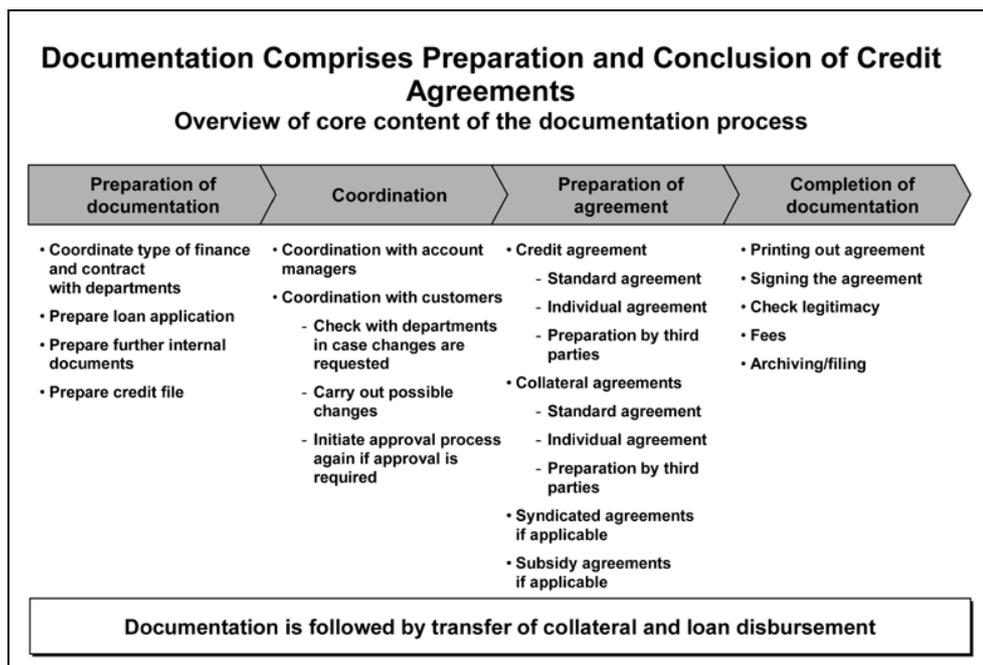
Chart 10



2.5.3 Internal Documentation and Credit Agreements

Documentation comprises the internal compilation of files as well as the preparation and conclusion of credit agreements. Chart 11 shows an overview of the most important individual process steps. From a risk perspective, the central issue here is the detailed description of the process steps to be carried out and the responsibilities in the internal guidelines.

Chart 11



The credit file is the central instrument of documentation. It should include all documents and decisions relevant for the credit approval so that it is possible to review the credit approval process at any time. Some banks use systems that allow the automated preparation of credit agreements based on the information in the credit file. This is done with the help of programs that combine predefined text modules in predefined patterns. At the same time, data specific to the exposure are included. The credit officer can then focus on reviewing the agreements, as procedural errors are largely excluded. A distinction has to be made between the internal coordination and review of contracts and the legally effective conclusion of contracts between bank and borrower. Therefore, the internal guidelines also have to stipulate the *signing authority*.

Internationally, systems that allow the fully electronic compilation of the data to be recorded in the course of the credit approval process are becoming increasingly important. Such “electronic files”, which – in their most sophisticated form – are embedded in a workflow management system covering the entire process, make it possible to significantly increase efficiency, particularly for standardized transactions. The continuous monitoring of the data entry and analysis process also helps avoid procedural errors. Thus, the automatic transfer of data prevents errors in the manual transfer of data. In addition, the process is continuously checked against the individual process steps (workflow management) stipulated in the internal guidelines, which means that employees handling the system are automatically informed of errors occurring in processing the exposure they are working on. However, it is still necessary to physically file the original documents.

2.5.4 Credit Disbursement Check

Prior to disbursing the credit, the individual credit exposure should be subjected to a final check. This check should cover at least the following points:

- compliance with internal guidelines;
- completeness of the credit application;
- receipt of confirmation that the credit applicant has complied with the conditions imposed; and
- signing of the credit and collateral agreements in accordance with the decision-making structure.

Checklists should be used to achieve a risk-mitigating standardization of the process. Suitable samples (segment-specific, if necessary) should be included in the internal guidelines.

Various models may be provided to carry out the credit disbursement check. In terms of efficiency, it may be useful to centralize the credit disbursement check for segments with a large number of comparable credit applications. In many cases, however, the credit disbursement check is carried out by the immediate superiors of the employees responsible for the exposure. Risk aspects require the specific design of the process to make sure that the employee performing the check arrives at a decision independently of the employees responsible for the exposure working in sales, risk analysis, or credit approval processing.

2.6 Continuous Monitoring of Credit Exposures, Early Warning System, and Reminder Procedures

Throughout the contractual relationship between the credit institution and its borrowers, economic developments may bring about changes that have an impact on risk. Banks should monitor their credit exposures continuously to detect such changes in time. In general, this is done by means of so-called periodic and regular checks. Individual exposures are checked at fixed periodic intervals. Many banks integrate these checks in the roll-over of credit exposures which becomes due as periods expire.

In order to detect risks already *prior* to the periodic check to be carried out due to the expiry of a specified term, many banks use *early warning systems*. Based on early warning indicators which have to be defined for each segment, a differentiated review process is triggered. Among other things, these early warning systems take into account defaults with regard to the contractual relationship between bank and borrower. Of great importance here is the insufficient performance of interest and principal repayment obligations. In order to react to these situations, banks have set up reminder procedures to inform the debtor of the default. Finally, this subsection thus looks at the structure of reminder procedures, which at the same time serves as a link to the next subsection, which deals with special servicing processes as opposed to standardized servicing processes.

2.6.1 Periodic Reviews and Roll-over

The processes governing the design of periodic reviews and roll-over differ only in a few aspects. The terminological distinction is based on different process triggers. While periodic reviews are carried out at intervals to be determined in the internal guidelines,³⁸ the roll-over is triggered by the expiry of a contractually agreed period. In practice, banks try to carry out upcoming roll-over in the course of the periodic review. If it is not possible to do both at the same time, the internal guidelines may stipulate a period after the most recent review during which a roll-over can be carried out without the need for a new credit review. If this period has expired, the process of periodic review also has to be conducted in case of a roll-over. Below, we present the process of periodic review as the basic process. The only difference between a periodic review and a roll-over is that the latter offers the possibility to agree changes in the contractual stipulations of the credit exposure with the customer (e.g. new conditions) or to terminate the exposure properly.

Typically, a periodic reviewed is carried out at one-year intervals starting from the date of credit approval. For companies preparing financial statements, the periodic review should be carried out as shortly after the balance sheet date or the date of submitting the balance sheet as possible.

³⁸ *Basel II also requires a periodic review for IRB banks. See also Annex D-5, 2.2 EU draft Directive.*

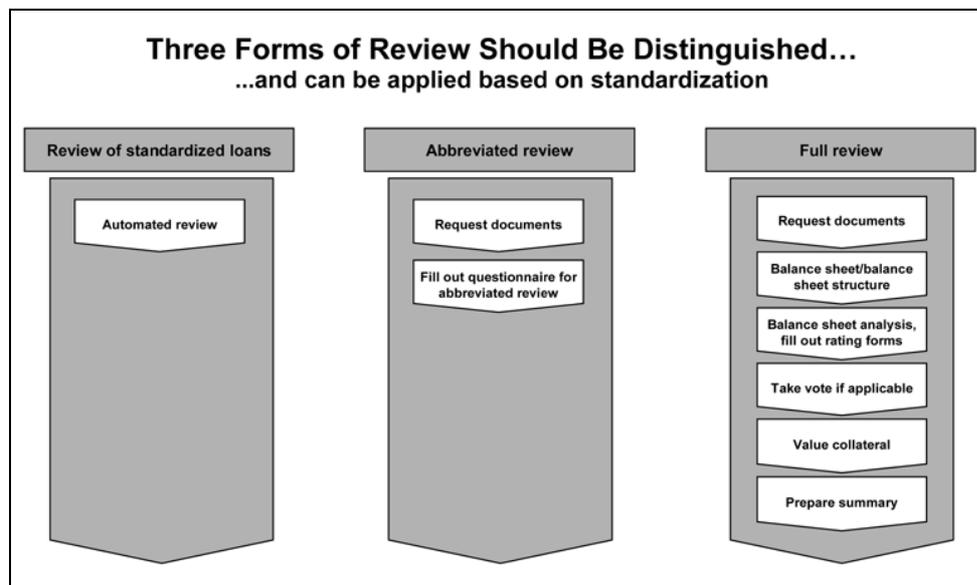
The review of credit exposures should comprise four major activities:

1. assessing the personal and economic situation of borrowers based on current data;
2. adapting the rating, if applicable;
3. checking and evaluating the available collateral;
4. checking and modifying the conditions.³⁹

The review should focus on the development since the most recent approval or review. The decision-making structure should stipulate who is responsible for periodic reviews. In most case, it will be that level of authority which would also be in charge of approving new credit applications.

In order to make the review as efficient as possible, banks typically distinguish between three types of review. Chart 12 shows an overview of the various processes. The differentiation is motivated by the differing risk level of the exposures entering the individual process chains.

Chart 12



The review of standardized credits usually comprises small-volume credit exposures for which the rating process has determined a low probability of default. The internal guidelines have to define the limits of automated review based on exposure volume, credit standing, and type of credit. The additional review triggered by risk signals from the early warning system makes up for the manual check which is not carried out here. These signals are discussed in section 2.6.2.

Just like the review of standardized credits, the *abbreviated review* is a tool used for reasons of efficiency. Here, too, a full and comprehensive review of the credit exposure is not carried out. In general, the banks just update the review-related documents and use a short, standardized questionnaire which has to be completed by the employee from the credit analysis department responsible for the exposure. This questionnaire confirms the receipt of the

³⁹ Only if a roll-over is carried out at the same time.

review-related documents and the plausibility check of these documents. Typically, the questionnaires relating to the abbreviated review process contain checklists to check the data received for validity and plausibility. The following list is an example of the content of a questionnaire relating to the abbreviated review process :

- received balance sheet/statement of receipts & disbursements, and plausibility check
- checking debt service capacity
- reviewing account movements
- checking and assessing significant deviations of financial figures or personal data compared to the previous review of the exposure.

A detailed layout of the questionnaires has to be found in the internal guidelines. In any case, there should also be guidelines stipulating a full review in case certain credit assessment changes occur. The decisive factor for the range of application of the abbreviated review process is – as was already the case for the review of standardized credits – the existence of an early warning system. The early warning system makes up for the comprehensive review which is not triggered by risk signals and is not carried out here.

A *full review* comprises a comprehensive review of the borrower's economic and personal situation in analogy to a new credit application. The division of tasks between sales and credit analysis/processing is typically the same as that for the preparation of the credit proposal for new transactions.

In addition to the classification into three process types described earlier, a differentiation in the documentation of the review can also simplify the task of the credit officers. Chart 13 shows a sample differentiation based on rating classes.

Chart 13

Rating class	Risk analysis	Documentation	Maximum authority level
Rating class 1 ⁽¹⁾	Complete (no exception)	Standardized brief documentation	Head of department
Rating class 2 ⁽¹⁾	Complete (no exception)	Standardized brief documentation incl. additional comment	Head of department
Rating class 3 ⁽¹⁾	Complete (no exception)	Complete (no exception)	Division manager (executive board member in exceptional cases)
Deterioration for rating class > 1 step	Complete (no exception)	Complete (no exception)	Division manager/executive board member

Exceptions: no simplification of processes in case of impending significant changes in margins

(1) To be specified within the bank

2.6.2 Risk-triggered Reviews – Early Warning Systems

The events triggering a review of credit exposures described in section 2.6.1 are independent of the occurrence of risk signals arising from the business relationship with the borrower. Risk-triggered reviews, by contrast, are contingent on the actual occurrence or the assumption of negative criteria with regard to the borrower’s credit standing also in between review dates.

2.6.2.1 Development

In many cases, an unscheduled review of credit exposures is carried out after receiving informal notification concerning new details about the customer from the account manager or third parties. This individual approach, however, should be complemented by a standardized and automated trigger process. This is usually done within the framework of so-called early warning systems. The immediate goal is the consistent and uniform trigger of the review process and thus a reduction of the individual process and assessment risk.

Basically, two models can be distinguished:

- heuristic models (in particular risk grids)
- empirical statistical procedures (in particular discriminant analysis)

2.6.2.2 Heuristic Models⁴⁰

These systems are characterized by the definition of individual risk signals that are checked at regular intervals and usually in an automated manner. They are used both in the retail and the corporate customer segment. Chart 14 shows a list of common risk signals. Typically, the risk signals used are assigned points to weight their significance. Highly developed models of this kind adapt the action derived from the early warning system with the total number of points as well as with the distribution pattern.⁴¹ In addition, such systems are linked to a customer contact database which contains information about contacts with the customer in the course of the business relationship and about the customer’s reactions in each case.

Chart 14

Common Risk Signals in Static Early Warning Systems		
Illustrative selection		
Retail customers	Corporate customers	Updating intervals
Overdrafts	Overdrafts	Daily
Insufficient credit transactions	Insufficient credit transactions	
Pledges	Pledges	
Delays in interest/principal repayment	Delays in interest/principal repayment	
	Markedly increased utilization of credit lines	Monthly
	Evidence report	
	Industry information	4 times per year

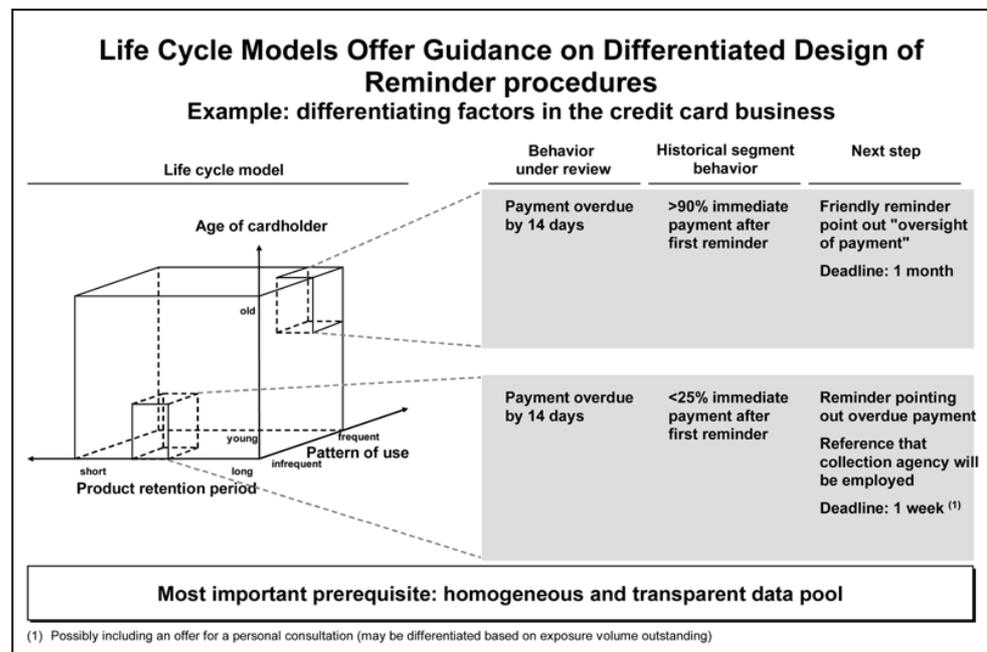
⁴⁰ Also see section 2.4.1.

⁴¹ Also see chart 15.

2.6.2.3 Empirical Statistical Models

Multivariate discriminant analysis is used in most cases here. This procedure assumes that troubled companies show certain common characteristics which distinguish them from sound companies. The derivative of a discriminant function needed for this procedure requires a large and homogeneous number of comparable borrowers. Accordingly, this procedure is primarily used in the retail segment (standardized business). Once a discriminant function has been defined, this is also applied to all credits of the respective segment at scheduled intervals and in an automated manner. However, the result of the multivariate discriminant analysis does not replace the review of the exposure, which is then used to determine the way in which to proceed with the exposure in question. On occasion, this system is therefore complemented by so-called pattern recognition processes (also called “life cycle models”). In addition to the discriminant analysis, each borrower is classified according to a comparison grid (“life cycle grid”). The determinants of this comparison grid have to be defined in a product-specific manner. For credit card business, for example, banks could use the variables retention period, age of the cardholder, and pattern of use (infrequent, average, frequent use) to design the grid. The resulting segments contain records about the behavior of the cardholders comprised therein. Comparing the exposure under review with the other exposures in the same segment makes it possible not only to make a statement about the probability of default (by establishing whether there are more “good” or “bad” exposures in the vicinity of the exposure under review), but also to draw conclusions for the further procedure with regard to the exposure. Chart 15 illustrates this procedure.

Chart 15



2.6.3 Reminder Procedures

In case of default on interest or principal repayment on the part of a borrower, a formal reminder procedure has to be initiated.

Reminder procedures are part of the credit monitoring of individual credit exposures. In order to avoid forgetting to send out reminders, credit institutions should apply standardized and automated reminder procedures. If the IT system registers the occurrence of a default on interest or principal repayment, a collection letter should automatically be sent to the borrower. The length of the waiting period has to be stipulated in the internal guidelines and implemented in the systems⁴². This ensures that collection letters are sent out in time in every case.

Furthermore, tight reminder deadlines are useful for risk considerations. This is true in particular as the lender's position may deteriorate compared to other creditors of the borrower during this period.

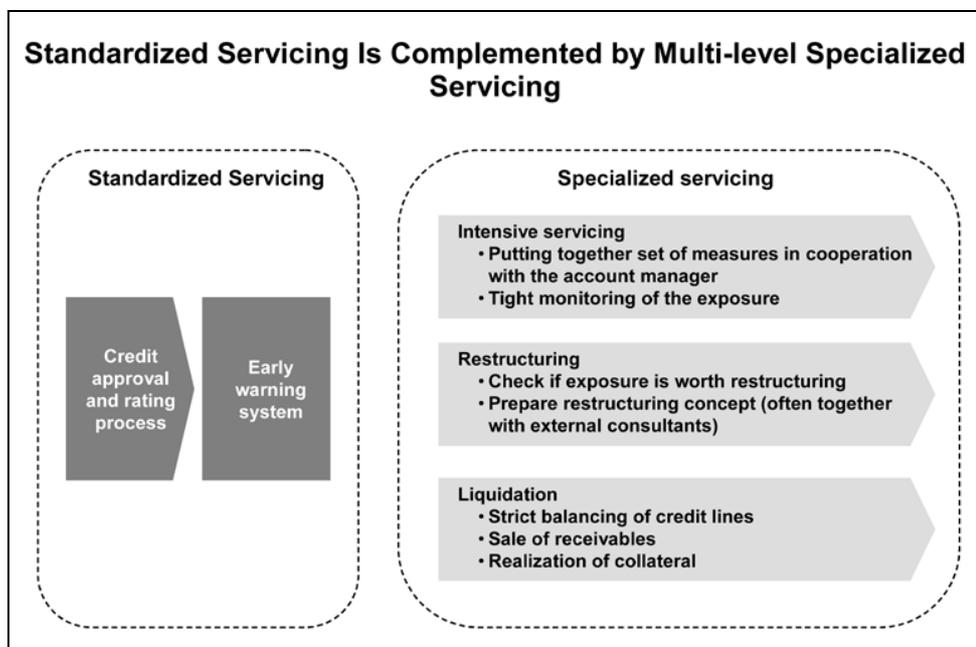
In order to make collection letters as effective as possible, some banks use a discriminating approach which is based on the classification of the borrower identified by an early warning system. Typically, both the wording of the text and the payment deadline are modified accordingly (see also chart 15).

For business reasons, it is possible to exclude certain customers from the standardized reminder procedures (individualized reminder procedures). The prerequisites for an individualized reminder procedure have to be stipulated in detail in the internal guidelines. It is important that no general exception is made for entire groups of customers. Quite on the contrary, the exception should apply only to those customers whose contributions to earnings justify the resulting risk and the associated process cost. Therefore, the rules should define minimum contribution margins. If the individualized process – usually in the form of a personal conversation with the borrower – does not yield any results, the standardized reminder procedure should be initiated.

2.7 Intensive Servicing and Handling of Troubled Loans

If a borrower's credit standing deteriorates, the bank should interfere in the standardized servicing process and try to control credit risks that are imminent or have already taken effect. This should ensure that adequate measures to secure claims can be taken in time. The objective is not only an improved collateral position of the lender compared to other creditors (caused by the time gained by taking early precautionary measures), but also an effective restructuring of the borrower's debt, thus preventing the total loss of the credit exposure. It does not make economic sense to continue the credit exposure, the workout of the exposure and the resulting sale of the collateral should be initiated. Chart 16 illustrates the typical process components of identifying and handling troubled loans.

⁴² With regard to Basel II, it is important to make sure that the collection procedure is in line with the definition of "default" used.



2.7.1 Transfer Process and Responsibilities

2.7.1.1 Definitions and Delineations

In this context, the term *special servicing* subsumes the process components *intensive service*, *credit restructuring*, and *workout*. These are delineated by way of exclusion from the standardized servicing of individual credit exposures. With regard to process and risk, intensive servicing additionally has to be distinguished from the restructuring and workout process. In practice, the last two processes are usually combined under the term '*handling of troubled loans*'. This separation is based on the different credit risk potential inherent to each case.

In contrast to intensive servicing, which covers exposures with a *high* probability of default, the restructuring process deals with avoiding or mitigating *specific* credit default risks. Thus, the decisive factor is the probability of credit default. Typically, we speak of a specific credit default risk if the exposure would almost certainly default without a change in the borrower's business policy.

Workout deals exclusively with credit exposures that have already defaulted.

2.7.1.2 Economic Rationale behind Differentiation

The differentiation between intensive servicing, credit restructuring, and workout is based on the consideration of risk and efficiency aspects. For efficiency reasons, the bank should attempt to put as little effort as possible into exposures that cannot be restructured. As insolvency would usually rule out further business with the borrower affected, in many cases, the expenditure cannot be offset by additional income from new business. Therefore, the first step is an intensive process modeled on the standardized process. The restructuring process is only applied to those exposures whose default would have a significant impact on the bank's earnings situation and for which restructuring seems possible. Ultimately, this means weighting the level of the expected loss against the cost associated with restructuring the exposure.

2.7.1.3 Characterization and Responsibilities

The processes used in special servicing differ in terms of content and objective of the activities and actors involved in those processes. Chart 17 shows an overview of these dimensions.

Chart 17

Steps in Special Servicing				
Steps in special servicing	Characterization	Employees sales	Employees processing	Employees special servicing
Intensive servicing	<ul style="list-style-type: none"> • Agreements or other measures to reduce exposures • Change financing structure • Tight account management • Agree on continuous reporting by customer • Improve collateral • Change credit agreement 	Comprehensive servicing ⁽¹⁾	Comprehensive processing	No processing
Restructuring process	<ul style="list-style-type: none"> • Preparation of comprehensive restructuring concept (possibly including an external consultant) • Accompany financial restructuring addressing a number of special issues (financing structures, hedging constructions) • Reversal of hidden reserves 	Activities only on initiative of specialized servicing	No processing	Complete servicing and processing
Liquidation process	<ul style="list-style-type: none"> • Liquidation of credit exposures • Realization of collateral • Participation in court-ordered auctions • Administration and realization of assets acquired in court-ordered auctions • Sale of receivables 	Activities only on initiative of specialized servicing	No processing	Complete servicing and processing
Rigid compliance with assigned roles ensures orientation towards risk and business policy measures of specialized servicing				

(1) Possibly including employees from restructuring (so-called co-servicing)

While intensive servicing remains the responsibility of the employee in charge of the standardized process, the restructuring and workout processes usually involve a shift of responsibility to specialized employees.

2.7.2 Transfer Processes

2.7.2.1 Transfer from Standardized Servicing to Intensive Servicing

High-risk exposures should be monitored closely by the employee responsible in sales and processing. As there is usually *no* change in responsibility, a formal transfer is not necessary. In many cases, the resulting split of responsibilities leads to banks maintaining so-called intensive servicing databases,⁴³ showing all customers who are monitored in the course of intensive servicing.

2.7.2.2 Transfer to the Restructuring Process

The internal guidelines should contain clear and preferably standardized rules on the factors triggering the transfer. The specific reasons for a transfer from standardized or intensive servicing to restructuring have to be laid down in the credit files. The reasons must be defined in a way that allows an independent check of the major reasons for transfer. Most importantly, the documentation of the reasons for transfer is required as the transfer to restructuring often entails a change in responsibility within the bank. Furthermore, the resulting process risks should be limited by using strict guidelines and standardized handover reports. As the treatment of exposures in restructuring requires a massive

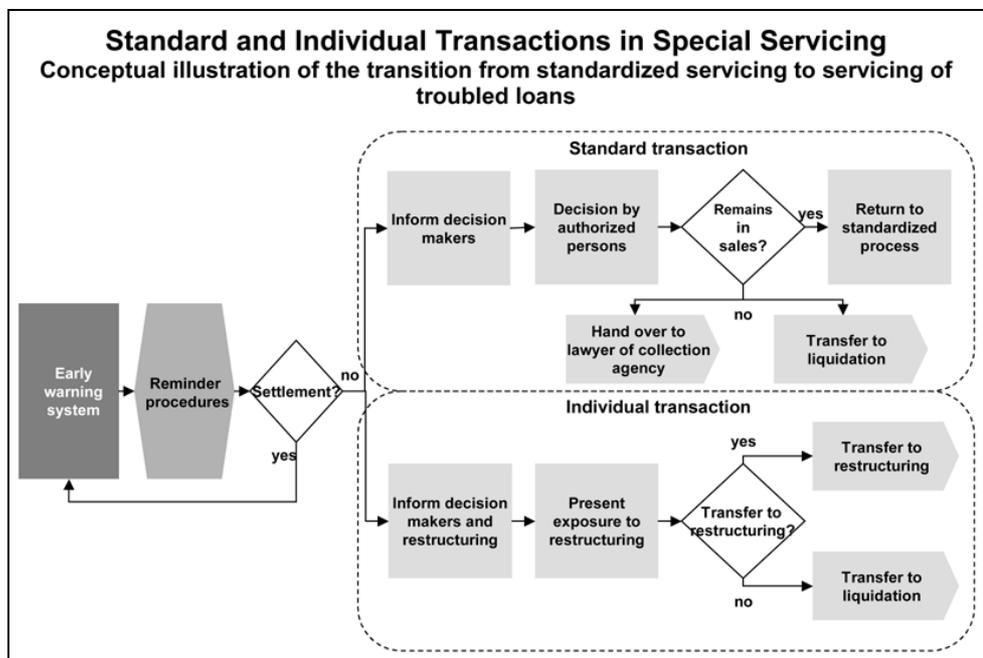
⁴³ Ideally, these are embedded in an IT environment which reflects the entire credit approval process.

use of resources, the handover decision should also include a cost-benefit analysis. In practice, it has been shown that a large number of exposures cannot be restructured efficiently. Therefore, many credit institutions *do not* provide for restructuring in the retail segment, especially not for standard products. Instead, non-performing exposures are handed over straight to the workout process. Thus, it is advisable to distinguish between standard and individual transactions. The internal guidelines have to stipulate the types of business covered under standard and individual transactions.

When an exposure is transferred to restructuring, the collateral should be reviewed and, if necessary, reevaluated.

Chart 18 illustrates the options presented above.

Chart 18



2.7.2.3 Transfer to the Workout Process

The workout process is the last sub-process in processing delinquent exposures. Exposures from standardized and special servicing can be subjected to this process directly. The reasons for the decision to hand over an exposure to the workout process have to be laid down in the credit files. The reasons must be defined in a way that allows an independent check of the major reasons for transfer.

When an exposure is transferred to the workout process, the collateral should be assessed from a liquidation perspective.

2.7.3 Design of Intensive Servicing

Intensive servicing should be a process designed to maintain the customer relationship, with the goal of minimizing the risk associated with the exposure. When an exposure is subjected to intensive servicing, the employee in charge in processing and the account manager should make an according note in the credit file summarizing the measures that are to be taken to secure the claims (so-called intensive servicing strategy).

Examples of elements of an intensive servicing strategy include the following:

- agreements on exposure reduction
- changes to the finance structure
- restrictive account management
- agreement on continuous reporting on the part of the customer
- collateral enhancement
- changes to the contract design

In addition to the entry in the credit file, the exposures subject to intensive servicing should be documented in a bank-wide database (intensive servicing database)

Intensive servicing cases should be reviewed by the employee responsible in processing at an interval to be stipulated in the internal guidelines. If there are reasons for a review at an earlier time, such a review should be conducted also if unscheduled.⁴⁴ In the course of the review, the development of the exposure under the intensive servicing strategy should be assessed as well.

Any changes in the intensive servicing strategy should be entered both in the credit file and in the intensive servicing database. It has to be documented if the exposure remains in intensive servicing, or whether it is transferred to standard servicing or to restructuring/workout.

2.7.4 Design of the Restructuring Process

The restructuring process is typically carried out by employees that are not in charge of the exposure in the standard servicing process. Two reasons are particularly relevant here:

- special know-how
- potential problems with regard to the close relationship between standard account manager and customer

The transfer of an exposure to restructuring should be accompanied by a written documentation of the borrower's economic situation with reference to the existence of the relevant characteristics of a restructuring case.

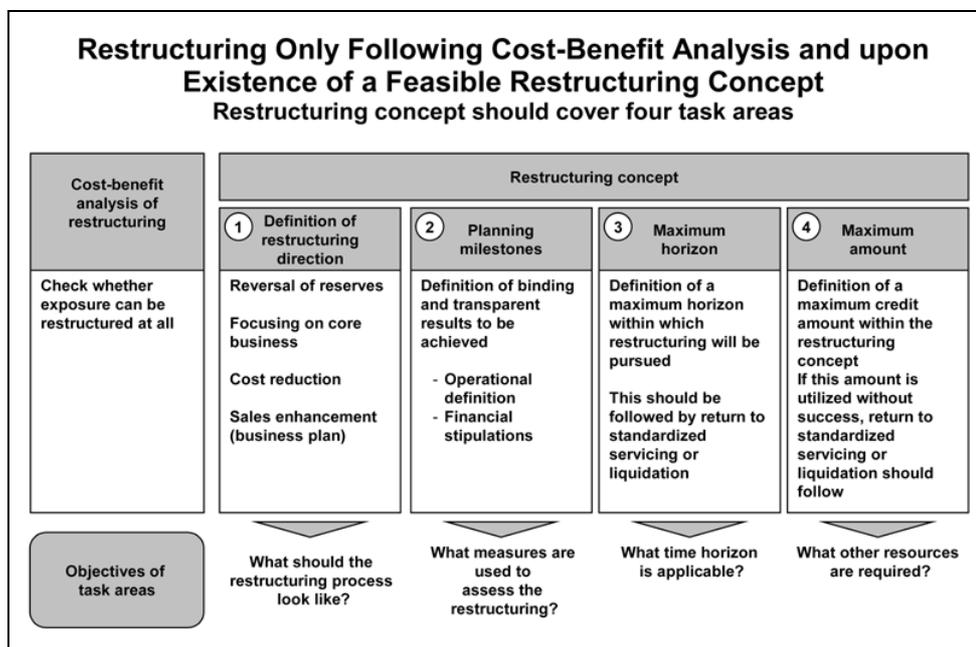
In order to ensure an efficient restructuring process, it is important to prepare a cost-benefit analysis and a restructuring concept.

In the course of the cost-benefit analysis, a potential restructuring success (including probability of occurrence) has to be weighed against the cost arising to the bank in connection with the restructuring. In particular, it is essential to scrutinize further risks for the bank to the extent that the restructuring requires further lending. If the employee in charge of the exposure draws a favorable conclusion with regard to possible restructuring of the exposure, the next step is the preparation of a restructuring concept. Restructuring concepts should comprise four major themes:

1. determination of the basic restructuring orientation;
2. planning of milestones (e.g. financial planning);
3. temporal limitation of restructuring efforts;
4. financial limitation of restructuring efforts.

Chart 19 shows an overview of the four task areas.

⁴⁴ Also see section 2.6.2.



It should be checked at regular intervals if the milestones of the restructuring concept have been reached. These reviews should also include an assessment of the restructuring progress with regard to a timely achievement of objectives. The person in charge has to be informed of the results. This person then has to make a decision on the further procedure in connection with the exposure in question, especially taking into account the original restructuring concept.

2.7.5 Design of the Workout Process

An efficient execution of the workout process is contingent upon the existence of clear guidelines on handling different types of claims and collateral. Therefore, the internal guidelines should contain relevant process rules. As many examples show, deviations from the workout strategy defined in the internal guidelines should not be permissible in the course of workout. Therefore, the leeway for employees in charge of workout should be defined narrowly. Sometimes credit exposures below a threshold volume to be defined in the internal guidelines are handed over to collection agencies. The internal guidelines also have to clarify whether this involves a sale of the claim, or whether the collection agency merely performs the service on behalf of the bank. The same is true for the mode of workout. In practice, one can find both lump-sum fees and fees defined as a certain percentage of the collection proceeds. Those exposures which are not handed over to external collection agencies should be assigned to an organizational unit specializing in the realization of collateral. This unit checks if selling the collateral makes economic sense and what type of realization presents the best option if various approaches are possible. If this is feasible, the necessary steps to realize the collateral in legal or out-of-court proceedings have to be taken.

In many cases, the collateral is not realized immediately based on the argument that higher proceeds are to be expected or that the sale will make

economic sense only at a later time. The time of realization does indeed have a significant impact on the realization proceeds. For real estate in particular, postponing the disposal may be sensible due to fluctuations in the market. However, the administration of this “deferred” collateral requires a major portfolio management effort; therefore, the internal guidelines should contain mandatory rules limiting the use of this option.

2.7.6 Risk Provisions

Finally, the processes concerning the set-up of specific loan loss provisions as well as recording the write-off of claims are discussed.

2.7.6.1 Setting up Specific Loan Loss Provisions

The fundamental regulations governing the determination of specific loan loss provisions are stipulated in the commercial and the tax code. For reasons of completeness and easy access, these norms should be contained in the internal guidelines.

The set-up of specific loan loss provisions requires a forecast including all factors that can be expected to affect the extent of the provisions. Furthermore, the determination of the reduction in value requires the valuation of the collateral associated with the exposure. In accordance with the lending principles stipulated in the internal guidelines, the current loan-to-value ratio forms the initial value used to determine the collateral value. If there are any doubts about the actual value, the loan-to-value ratio has to be reviewed and modified if necessary. The internal guidelines should lay down the possibilities to determine loan-to-value ratios in the set-up of specific loan loss provisions. This lending value may be reduced from case to case to account for the marketability of the asset as well as an objective assessment of the sales prospects at the balance sheet date. The employee in charge has to justify the reduction in value in the credit files. Furthermore, it has to be ensured that the realization costs are taken into account when determining the collateral value relevant for the specific loan loss provision.

The set-up of specific loan loss provisions is subject to special documentation requirements. This should help avoid inquiries and duplicate efforts with regard to an external review.

In general, the request for setting up a specific loan loss provision is filed by the employee in charge of the exposure in credit approval processing in coordination with the account manager responsible. Provisions for exposures that have already been transferred to restructuring or workout are set up by the employees managing the exposures in those departments.

2.7.6.2 Write-offs

Write-offs of claims refer to those amounts by which claims are reduced as a result of becoming uncollectible. This includes direct write-offs as well as the utilization of specific loan loss provisions.

The exposure should be written off if

- the collateral of the related exposure has been realized in full or is of no value; or
- the claims were waived in part or in full, and
- no more payments on the remaining claim are to be expected.

Stipulations governing the decision-making authority have to be laid down in the internal guidelines. The request for a write-off of claims should include the presentation of the reasons for the default. Furthermore, it should contain a statement as to whether the claim should be pursued any further. The claims should be recorded in a central list of defaulted claims which is uniform for the bank as a whole. Depreciation and provisions should be recorded continuously, also throughout the year.

3 Credit Risk Management

3.1 Introduction

3.1.1 Content and Objectives of this Chapter

This section of the guideline describes risk management as part of the lending business of banks. This is done by outlining the basic elements of risk management in the context of bank-wide capital allocation and defining the central requirements on effective risk management. As some of the issues discussed in this context cannot be dealt with exclusively in terms of credit risk, there are occasional switches between a bank-wide perspective and a narrower look at the credit sector, with this change of perspective not always being made explicit to allow for smooth reading.

Starting from the requirements on risk management in banks, the first subchapter provides an overview of the functions of risk management and shows the basic prerequisites in terms of organization and processes. This is used as a basis to derive the strategic and operational core elements of credit risk management. The second subchapter explains the importance risk management has for bank-wide capital allocation and shows how the content of the following subchapters can be regarded as parts of an integrated system to combine value and risk management at all organizational levels. The third and fourth subchapters show how banks determine their risk-bearing capacity and build their credit risk strategy on that basis. Subchapter five then deals with the question of capital allocation, while the subchapters six and seven outline the ways in which banks can limit their credit risks by setting risk limits and control these risks by means of active portfolio management. The eighth subchapter finally works out the main requirements for risk controlling systems that banks use to manage their risks.⁴⁵

3.1.2 Functions of Risk Management

Risk management contains

1. identification,
2. measurement,
3. aggregation,
4. planning and management,
5. as well as monitoring

of the risks arising in a bank's overall business. Risk management is thus a continuous process to increase transparency and to manage risks (see chart 20).

1. A bank's risks have to be *identified* before they can be measured and managed. Typically banks distinguish the following risk categories:

- credit risk
- market risk
- operational risk

There are further types of risks, such as strategic risks, or reputational risks, which cannot usually be included in risk measurement for lack of consistent methods of quantification.

⁴⁵ Even though this chapter places credit risk management within the context of risk-oriented bank-wide capital allocation as demanded under the second pillar of Basel II, this guide cannot take into account all aspects of the second pillar.

2. The consistent *assessment* of the three types of risks is an essential prerequisite for successful risk management. While the development of concepts for the assessment of market risks has shown considerable progress, the methods to measure credit risks and operational risks are not as sophisticated yet due to the limited availability of historical data.

Credit risk is calculated on the basis of possible losses from the credit portfolio. Potential losses in the credit business can be divided into

- expected losses and
- unexpected losses

Expected losses are derived from the borrower's expected probability of default and the predicted exposure at default less the recovery rate, i.e. all expected cash flows, especially from the realization of collateral. The expected losses should be accounted for in income planning and included as standard risk costs in the credit conditions.

Unexpected losses result from deviations in losses from the expected loss.⁴⁶ Unexpected losses are taken into account only indirectly via equity cost in the course of income planning and setting of credit conditions. They have to be secured by the risk coverage capital (see chapter 3.3.2.).

3. When *aggregating* risks, it is important to take into account correlation effects which cause a bank's overall risk to differ from the sum of the individual risks. This applies to risks both within a risk category as well as across different risk categories.

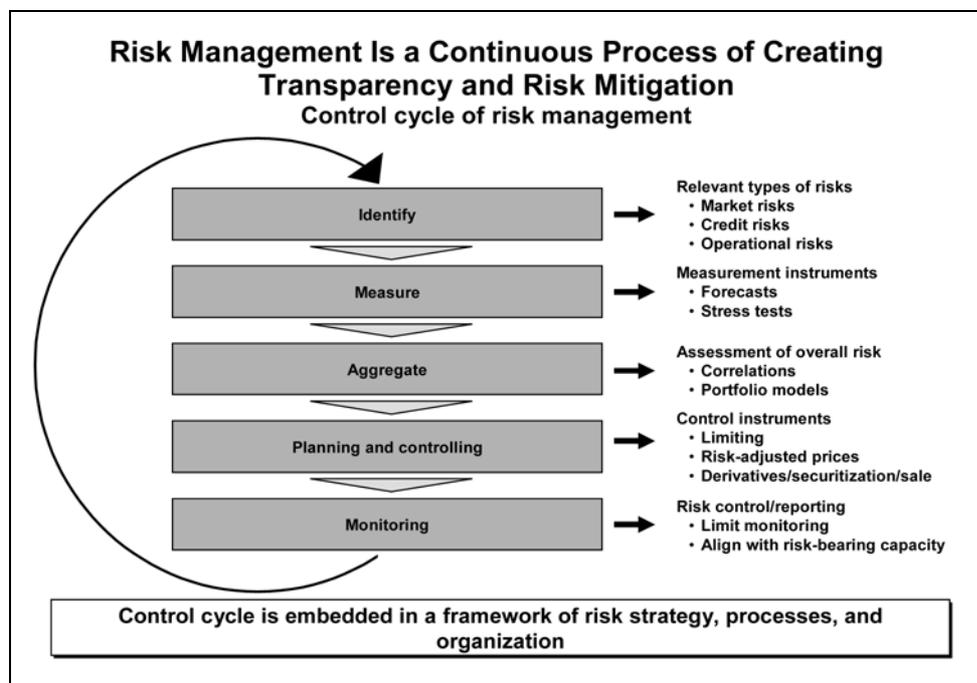
4. Furthermore, risk management has the function of *planning* the bank's overall risk position and actively *managing* the risks based on these plans. Managing should be taken to mean the following: the selective limitation of risk positions as well as the mitigation, or possibly increase, of these positions by means of financial instruments or suitable techniques. These instruments or techniques affect the risk of the individual position and/or influence changes in the risk position in the overall portfolio as a result of portfolio effects. The most commonly used management tools include:

- risk-adjusted pricing of individual loan transactions
- setting of risk limits for individual positions or portfolios
- use of guarantees, derivatives, and credit insurance
- securitization of risks
- buying and selling of assets

5. *Risk monitoring* is used to check whether the risks actually incurred lie within the prescribed limits, thus ensuring an institution's capacity to bear these risks. In addition, the effectiveness of the measures implemented in risk controlling is measured, and new impulses are generated if necessary.

⁴⁶ In the following, "risks" is always taken to mean unexpected losses.

Chart 20



3.1.3 Prerequisites for Efficient Risk Management

In order to implement efficient risk management, sound and consistent

- methods
 - processes and organizational structures
 - as well as IT systems and an IT infrastructure
- are required for all five components of the control cycle.

The *methods* used show how risks are captured, measured, and aggregated into a risk position for the bank as a whole. In order to choose suitable management processes, the methods should be used to determine the risk limits, measure the effect of management instruments on the bank's risk position, and monitor the risk positions in terms of observing the defined limits and other requirements.

Processes and organizational structures have to make sure that risks are measured in a timely manner, that risk positions are always matched with the defined limits, and that risk mitigation measures are taken in time if these limits are exceeded. Concerning the processes, it is necessary to determine how risk measurement can be combined with determining the limits, risk controlling, as well as monitoring. Furthermore, reporting processes have to be introduced. The organizational structure should ensure that those areas which cause risks are strictly separated from those areas which measure, plan, manage, and control these risks.

IT systems and an *IT infrastructure* are the basis for effective risk management. Among other things, the IT system should allow

- the timely provision and administration of data;
- the aggregation of information to obtain values relevant to risk controlling;
- as well as an automated warning mechanism prior to reaching critical risk limits.

The IT infrastructure is a central prerequisite for implementing modern risk management. As some of the methods and processes presented in this chapter require the maintenance and processing of large amounts of data, they cannot possibly be implemented without an integrated IT solution for the bank as a whole.

Prior to specifying the methods, processes, and organizational structures, as well as the demands on the IT system, we should look at the strategic core elements of risk management which derive from the combination of *risk management* and *value management* in bank-wide capital allocation.

3.2 Combination of Risk Management and Value Management

The objective of the combination of risk and value management is the transformation of return on investment required by equity investors into internal input parameters to maximize the return on capital. Certain conditions have to be met to reach this goal, and they will be discussed in the following six chapters:

1. determining the risk-bearing capacity
2. deriving a risk strategy
3. capital allocation
4. fixing limits
5. risk controlling
6. implementation of risk management systems

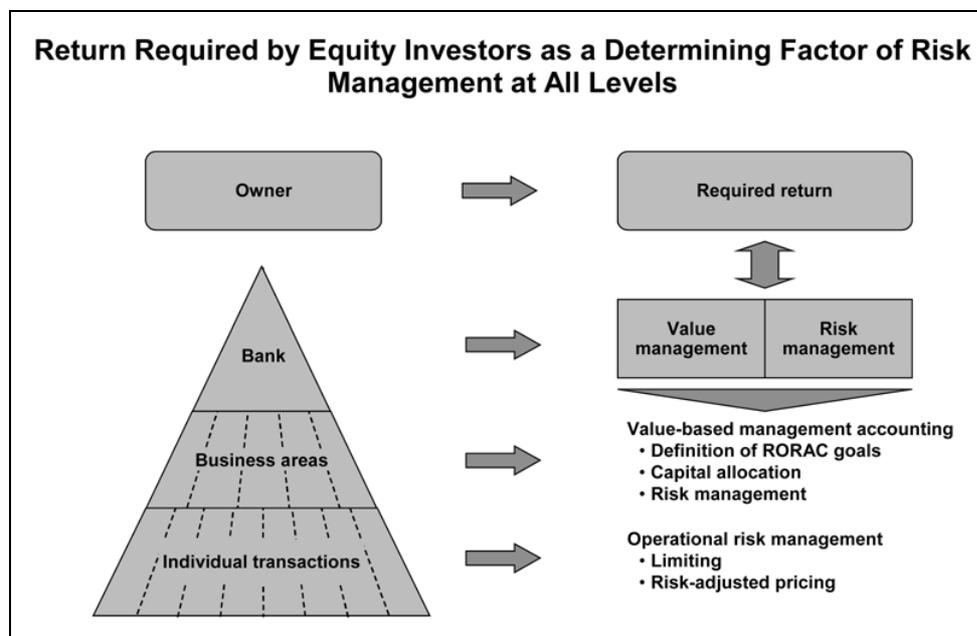
This chapter describes a possibility to link these areas by means of an indicator concept which is able to create compatible incentives at all organizational levels in order to maximize the bank's overall profitability. Based on a bank's risk-bearing capacity (chapter 3.3) and its risk strategy (chapter 3.4), it is thus necessary – bearing in mind the bank's strategic orientation – to find a method for the efficient allocation of capital (chapter 3.5) to the bank's individual business areas, i.e. to define indicators that are suitable for balancing risk and return in a sensible manner. Indicators fulfilling this requirement are often referred to as risk adjusted performance measures (RAPM) in the literature. The most commonly found forms are RORAC (return on risk adjusted capital), RARORAC (risk adjusted return on risk adjusted capital, usually abbreviated RAROC), and economic value added (EVA). As an example, the definition of RORAC is shown below:

$$RORAC = \frac{Net\ result}{Economic\ capital}$$

Net result is taken to mean income minus refinancing cost, operating cost, and expected losses. Please refer to chapter 3.3.4 for a definition of economic capital.

It should now be the bank's goal to maximize a RAPM indicator for the bank as a whole, e.g. RORAC, taking into account the correlation between individual transactions. Certain constraints such as volume restrictions due to a potential lack of liquidity and the maintenance of solvency based on economic and regulatory capital have to be observed in reaching this goal. From an organizational point of view, value and risk management should therefore be linked as closely as possible at all organizational levels (cf. chart 21).

Chart 21



Besides their function as a capital allocation key, RAPM indicators can also be used to assess the efficiency of employees within a bank's remuneration system. In order to ensure an allocation of returns and risks to organizational units and employees which reflects cause and effect as accurately as possible, a transfer pricing system fulfilling this requirement should be installed especially in the credit sector.

After determining an optimal capital allocation based on risk-bearing capacity and risk strategy by using RAPM indicators, this allocation should be restrained by a comprehensive system of limits (chapter 3.6).

The task of risk controlling (chapter 3.7) is then the continuous monitoring of risk and income positions, in order to react to changes in the market environment or the portfolio structure by initiating appropriate control measures such as secondary market transactions to optimize the risk/return profile of the bank as a whole.

Finally, the implementation of suitable risk management systems (chapter 3.8) ensures the timely and efficient processing of all data required.

3.3 Risk-bearing Capacity

Risk-bearing capacity denotes a bank's ability to cover the risks associated with banking by means of the available financial funds (e.g. equity, revaluation reserves, or profits). In case risks take effect, the resulting losses should be absorbed by these funds, in the following referred to as coverage capital. The amount of available coverage capital thus limits the extent of unsecured transactions a bank should enter into.

The risk-bearing capacity forms the basis for the bank's business strategy and risk strategy, as the risk allows only certain transactions to be secured by the coverage capital. The risk-bearing capacity thus has a significant impact on a bank's behavior in assuming risks, and thus in focusing and expanding its business.

In order to establish the risk-bearing capacity it is necessary to determine the coverage capital available to the bank. Management decides to what extent the available coverage capital may be used to absorb risks. Incomplete utilization of the coverage capital means that the bank has an additional risk buffer it can use, for example, to explore new business areas. At the same, this process ensures that risks that are not or not sufficiently quantified can be absorbed from the bank's actual portfolio.

3.3.1 Calculation of Risks

Two main methods are used to measure unexpected losses today:

- Value-at-Risk analyses or
- scenario techniques

Both methods are intended to measure the bank's risk as adequately as possible. However, they differ strongly in their calculation methods and their precision, with the scenario analysis as the simpler method being used in cases where a calculation of the VaR is not possible.

1. Scenario analysis

Under a scenario analysis, the available historical market data and/or internal bank data are used to create scenarios concerning the possible development of default rates.

Like in VaR analysis,

- scenarios for the *normal case*, in which loss developments are assumed that have already occurred in a certain historical period under review; and
- *worst case scenarios* assuming the incurrence of extreme losses

are assumed. These scenarios are used to determine the extent of the fluctuations in the portfolio's value for the occurrence of the event. Value fluctuations may, for example, refer to the extent of losses from lending or changes in the value of the collateral. The highest possible risk is calculated on the basis of the scenario analysis.

The scenario analysis is limited in its explanatory power as it takes into account only a few changes in parameters. Its results will be of lower quality than those of the VaR concept, as the scenarios applied are limited to a small number of historical events and the diversity of the parameters contained in the VaR concept cannot be achieved. Banks that base their risk controlling on the results from scenario analysis usually have to accept less precise results than they would get using the VaR approach. Therefore, it seems advantageous to shift to a value-at-risk process, but it is essential to determine what additional cost would be incurred in implementing the concept, and what additional benefit would be derived from more effective management that would result from the implementation.

2. Value-at-Risk Concept

The VaR states the maximum loss that will *not* be exceeded with a certain probability (confidence level) at a given horizon (holding period). To determine the value at risk, a confidence level is determined which reflects the probability that the calculated maximum loss will not be exceeded within the holding period. The confidence level is usually between 95% and 99.95%, which means that

higher losses are possible, but will only occur with a probability of between 5% and 0.05%. The holding period states the horizon during which the losses can occur and is derived from the liquidity of the assets observed.

To calculate the credit VaR, it is necessary to determine the distribution of potential losses in the credit portfolio. For this purpose, assumptions are made in terms of the future development of the default rate and the exposure at default (credit amount outstanding at the time of default, minus proceeds from collateral and estate).

The value-at-risk analysis has limited explanatory power; while it does state the amount of losses within the confidence level chosen, it does not offer any prediction as to the probability distribution of losses beyond that confidence level. Moreover, it usually does not take into account any extreme market movements as would occur, for example, in an economic crisis with extremely high default rates. Therefore, the VaR analysis should be complemented by stress tests which calculate the value fluctuations based on the assumption of extreme market movements.⁴⁷ The value-at-risk analysis offers the advantage that it allows the comparison of different risks not only across different portfolios, but also across different types of risks such as credit, market, and operational risks. However, this must not distract from the fact that the VaR is based on assumptions and estimates and can thus lead to misinterpretations of the risk. In addition, there are limits to the comparability and aggregation of different types of risks due to the different distribution of the risk types. Another restriction to the calculation of the VaR in credit risk is posed by the historical data which are often not available to a sufficient extent (e.g. on probabilities of default, exposure at default, and correlations).

3.3.2 Determining the Risk Coverage Capital

The risk coverage capital of the bank as a whole includes various items of the income statement as well as the balance sheet. Whether certain items are included or excluded is up to the management in line with their business policy. Bearing this in mind, the following should be regarded as a possible list of risk coverage capital components:

- *regulatory capital*⁴⁸ (it may make sense to distinguish further into tier 1 and tier 2 capital);
- *non-restricted equity*, which is not constrained by regulatory requirements;
- *reserves* set up for hedging purposes (unless restricted by regulatory capital requirements);
- *hidden reserves* that can be reversed upon sale of the underlying assets of appropriate marketability such as real estate (unless restricted by regulatory capital requirements);
- *planned profit* as reflected in the bank's operating earning power in the planning period.

The absorption of risks by the risk coverage capital should guarantee the continued existence of the bank. Using up the profit of a period or the bank's

⁴⁷ The performance of stress tests is considered a prerequisite for the approval of an IRB approach under Basel II.

⁴⁸ This is the capital pursuant to § 23 Austrian Banking Act which is needed to fulfill the solvency requirements under §§ 22ff of the Austrian Banking Act.

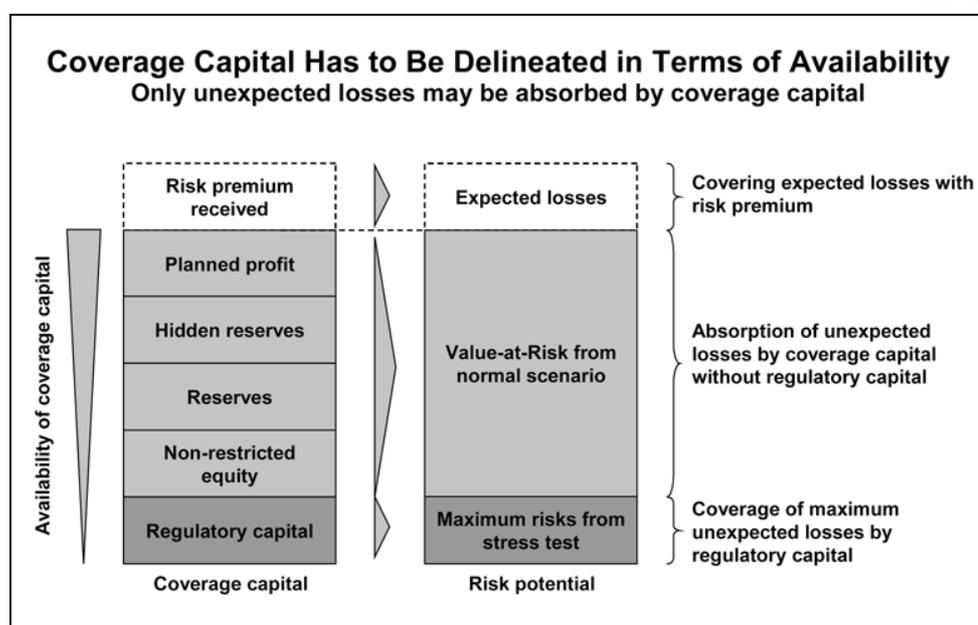
hidden reserves does not yet present a significant risk in terms of the bank's viability. Therefore, it is necessary to classify the means available and required to cover the risks incurred.

3.3.3 Comparison of Risk and Risk Coverage Capital

The risk coverage capital determined as described above is assigned to the two loss scenarios (normal case and worst-case scenario).

Even though the worst-case scenario is assigned a lower probability of occurrence, the bank has to be managed in a way as to have the financial capacity to absorb such worst-case scenarios. Risks incurred in a normal case should be covered by coverage capital that is not part of the regulatory capital requirements. This capital should be used to cover only those risks which take effect in a worst-case scenario.

Chart 22



Banks that partly base their risk-bearing capacity on regulatory capital requirements already for the normal scenario because of a lack of sufficient profits or reserves or revaluation reserves, hardly have any coverage capital available and are thus unable to take easy advantage of chances arising in the market by generating new business or entering new business areas. Therefore, a buffer should definitely be created and maintained. This should also be supported by defining risk limits which restrict the bank's risky transactions and ensure compliance with its risk-bearing capacity.

3.3.4 Economic versus Regulatory Capital

A bank's *economic capital* is determined by the sum of all coverage capital components to be held that are required to just maintain the bank's solvency in case of a maximum loss estimated under certain assumptions. The maximum loss is estimated under the assumption of so-called crash or worst-case scenarios. In general, it will be difficult to reflect such a worst-case scenario in a VaR calcu-

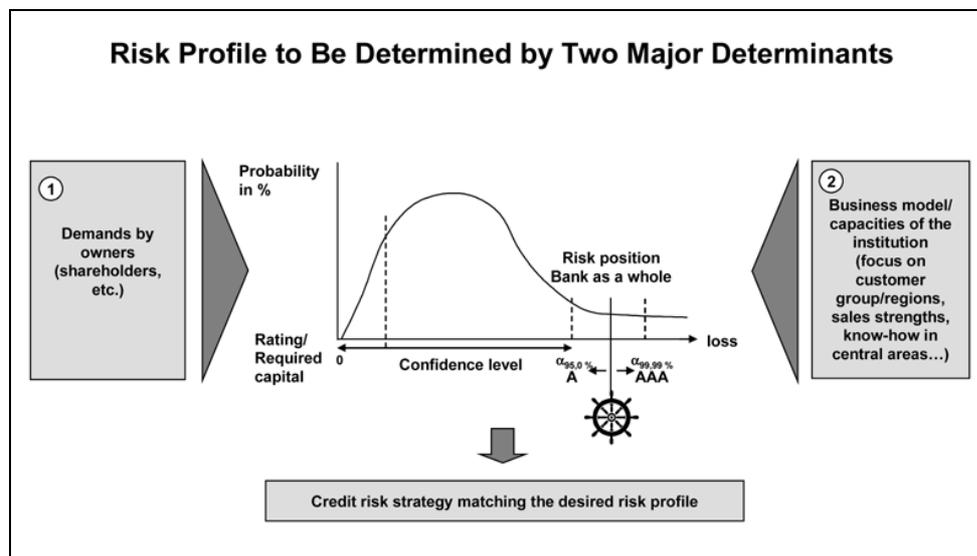
lation, as this calculation is based on “normal market conditions”, i.e. conditions that have been observed over the last few years. However, the calculation of extreme scenarios on a sub-portfolio or transaction level does not appear practical, and thus the total bank VaR is often used – assuming an appropriately high confidence level – to represent economic capital, applying this VaR as risk capital relevant for risk controlling. The economic capital can be applied to manage a bank’s activities by being used

- as the basis for allocating equity capital to the bank’s business areas;
- as the basis for calculating risk-adjusted earnings indicators; and
- to limit the risks (see section 3.6).

The amount of the economic capital determined is influenced strongly by the confidence level chosen. The higher the level, the greater the probability that the losses can be absorbed by equity capital. Thus, the choice of the confidence level has a major impact on the rating the bank receives for its own liabilities.

The institution’s risk profile is determined by the confidence level chosen for the economic capital, the owners’ demands in terms of return on equity, and the bank’s existing business model. This risk profile is laid down and specified further in the credit risk strategy. Chart 23 gives an example of these inter-relations.

Chart 23



As an alternative to economic capital, it is possible to use *regulatory capital* for risk controlling purposes.

The regulatory capital, however, is usually less precise in reflecting risks than economic capital, as the calculation currently used is based on very general assumptions. Basel II will bring the level of regulatory capital closer to that of economic capital and will thus make risk controlling based on regulatory capital more effective. However, the fact that portfolio effects are not taken into account under Basel II renders credit portfolio management based on the regulatory capital impractical.

3.4 Risk Strategy

A successful, bank-wide risk management requires the definition of a risk strategy which is derived from the bank's business policy and its risk-bearing capacity. In our context, risk strategy is defined as

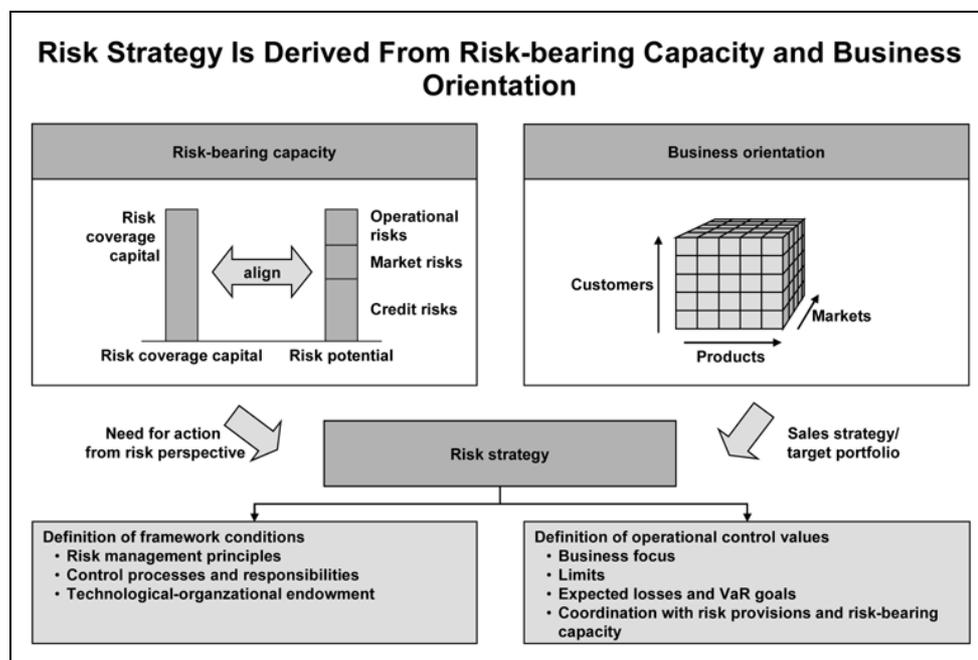
- the definition of a general framework such as principles to be followed in dealing with risks and the design of processes as well as technical-organizational structures; and
- the definition of operational indicators such as core business, risk targets, and limits.

The risk strategy in an operational sense should be prepared at least every year, with risk management and sales cooperating by balancing risk and sales strategies. The sales units contribute their perspective concerning market requirements and the possible implementation of the risk strategy. The proposal for a risk strategy thus worked out will be presented to the executive board, and following their approval, passed on to the supervisory board for their information.

The risk strategy serves to establish an operational link between business orientation and risk-bearing capacity. It contains operational indicators which guide business decisions. Specifically, the risk strategy should lay down:

1. core business areas in line with the target portfolio structure
2. risk limits
3. risk targets concerning expected and unexpected losses in line with the risk-bearing capacity
4. degree of diversification of the portfolio, limits for cluster risks

Chart 24



1. The risk strategy integrates the *core business* as defined in the business strategy. This entails stipulating the allocation of the available equity capital to the individual business segments, types of risks, products, and/or customer

groups. The desired distribution of risks is then defined as the target portfolio structure, which is then aligned with the existing portfolio structure. This structure, if necessary, will then be adapted by an appropriate limitation or expansion of business and suitable portfolio management measures (cf. chapter 3.7.3).

2. The *limits* for the individual risk categories, customer segments, and products stipulated in the process of calculating the risk-bearing capacity and business planning are based on the equity allocated and are laid down explicitly in the risk strategy.

3. The *economic capital* for the individual risk categories of the actual portfolio calculated by the bank is compared with the overall *risk-bearing capacity*. Furthermore, the expected losses of the target portfolio are compared with the *risk provisions* planned to be covered by current income in the financial year. In this manner, it is possible to show what losses the bank can expect for the following financial year, and how it is able to cover these losses first and foremost by means of risk provisions and use risk coverage capital only if necessary.

4. The *degree of diversification* shows the extent of the diversification of the bank's portfolio. The objective is to avoid cluster risks due to large individual exposures or concentration of similar risks in individual industries or regions as well as possible. The problem with cluster risks is that banks may suffer unusually high losses as a result of unfavorable developments of individual borrowers or industries, regions or rating classes, etc. By diversifying the portfolio the bank manages to guard against the dependence on individual developments and thus reduces its risk. In case the bank fails to reach the desired degree of diversification, it needs to take suitable measures, such as

- syndicating or securitizing the credits of an industry; or
- carrying out targeted investments in other industries or market segments (if sufficient non-restricted equity is available).

3.5 Capital Allocation

Besides composing the portfolio in accordance with strategic objectives, the best possible allocation of the available capital⁴⁹ to the individual business areas and sub-units is another important core task of efficient capital allocation.

The allocation of capital to the various business areas is determined mainly by two factors:

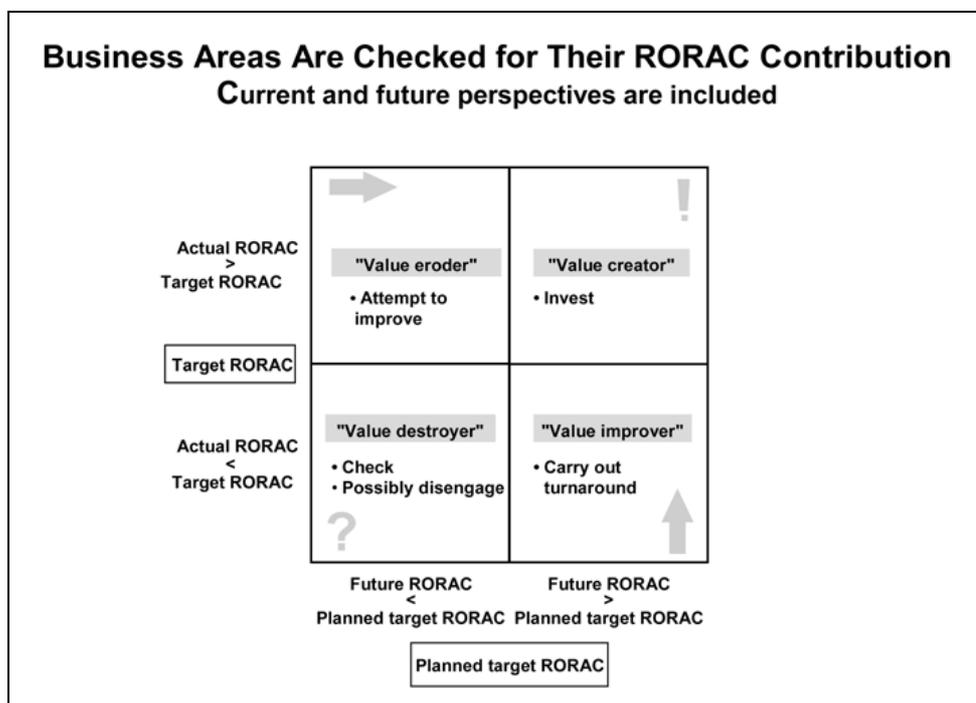
- the contribution the business areas make to the bank's overall target profitability;
- the volume of economic or regulatory capital required in the individual business areas to cover the risks.

In order to determine the capital allocation yielding the optimum return, one uses the expected profitabilities with regard to the risk specific to the business area, as expressed, for example, by RORAC. The actual RORAC for each business area is compared with the target RORAC for the bank as whole, which makes it possible to assess whether the individual business areas provide a sufficient contribution to reaching the target profitability. In accordance with the

⁴⁹ In this context, capital is not used in the sense of regulatory capital, but in line with the bank's own definition of economic capital.

strategic goal of maximizing the return, risk capital (and, in line with that, business volume) should successively be withdrawn from low-return business areas in order to be assigned to high-return business areas (see chart 25).

Chart 25



The following aspects have to be taken into account in defining the method used to allocate capital:

1. design of the allocation key
2. correlation effects in determining the risk capital
3. allocation process

1. Definition of the allocation key

Economic capital, regulatory capital, or a combination of both can be used as a key to allocate capital to the various business areas. Capital allocation on the basis of economic capital offers the advantage of a more precise reflection of risks at a lower level of aggregation, which is not possible using the current calculation of regulatory capital. This is particularly important with regard to the incentives that are created by considering the risk in pricing. Irrespective of the way in which the capital is allocated, the regulatory capital requirements of the Austrian banking Act have to be met at all times.

2. Taking into account correlation effects in determining the risk capital

The discussion below assumes that economic capital is used as the allocation key, and that this economic capital is calculated using the VaR approach.

In determining the VaR of individual business units, it is necessary to decide whether to calculate this VaR on a stand-alone basis or whether to compute it taking into consideration the correlation of the risk of the observed unit with the risks of other units.

Stand-alone observation means that the unit's risk is calculated using the assumption that no correlation effects are taken into account and that the risk of the unit is included in the bank's overall risk in full. Negating correlation effects leads to a situation in which the sum of the risks of the individual business areas exceeds the actual risk of the bank as a whole. Consequently, this means that limits that are based on the level of the stand-alone VaR of the business unit are too high in term of the bank's overall risk and can thus not be used for the allocation to other areas anymore.

This problem does not arise when the allocation takes into account correlation effects, but it is hardly possible to use this approach in practice as the precise nature of the correlation effects is usually not known. In order to make it possible to take correlations into account, after all, these correlations are estimated on the basis of historical data. Afterwards, the total bank VaR (which does account for correlations) may, for example, be compared with the sum of the VaRs of individual business units which were calculated on a stand-alone basis. The ratio of the two values is used to derive a factor by which the VaR for each business unit is multiplied and thus reduced by the correlation effects for the bank as a whole. This procedure can also be used to estimate the correlations of risks of sub-units belonging to individual business units, but it is subject to considerable imprecisions that require appropriately conservative assumptions.⁵⁰

3. Allocation process

The process of capital allocation can be designed in various ways:

Using *top-down allocation* within overall bank planning, management allocates a risk capital amount in connection with a RORAC target to each business unit and any sub-units. One of the disadvantages of this form of allocation is that it is fixed for a certain period of time and is usually based on historical data in terms of the risk capital required and the RORAC values achieved.

This disadvantage can be offset by including the business units in the allocation process and incorporating their expectations concerning the risk capital required in the future and the profitability of the unit. Taking into account expected future results makes it more likely to achieve optimal allocation. However, this method also has the disadvantage that there is no flexibility of allocation for a certain period up to the "renegotiation".

The *internal market for risk capital* offers another alternative procedure. Capital can be allocated by means of an auction, for example. The business units submit offers concerning the expected RORAC and are then, depending on how this value compares to those of other units, allocated risk capital to use at their discretion. It is the unit's own responsibility to achieve the target return indicated, and it is therefore authorized to allocate capital to the sub-units as it sees fit. In addition, it might be possible to allow a free trading of limits within and among the business units. This method offers several advantages; auctions can be carried out at any time during the year, risk capital can be allocated in a flex-

⁵⁰ The theory offers further methods to determine the contribution of units or individual transactions to the total bank VaR, e.g. marginal VaR, conditional VaR, or incremental VaR. To some extent, the implementation of these methods is already at an advanced stage in the field of market risk, but the application to all sub-portfolios of the bank as a whole is often impossible in practice due to the lack of timely data relevant for risk controlling (i.e. income and risk).

ible manner and used in the most productive way. The disadvantage is that the organizational effort required in using this method is relatively high.

3.6 Limits

The definition of limits is necessary to curb the risks associated with bank's activities. It is intended to ensure that the risks can always be absorbed by the predefined coverage capital. When the limits are exceeded, risks must be reduced by taking such steps as reducing exposures or using financial instruments such as derivatives or securitization.

3.6.1 Methods of Defining Limits

The risk limits in the bank's individual business units are based on the bank's business orientation, its strategy, and the capital allocation method selected. A consistent limit management system should be installed to define, monitor, and control the limits. Such a system has to meet the following requirements:

- The parameters used to determine the risks and define the limits should be taken from existing systems. The parameters should be combined using automated interfaces. This ensures that errors due to manual entry cannot occur during the data collection process.
- The defined indicators should be used consistently throughout the bank. The data should be consistent with the indicators used in sales and risk controlling.
- Employees should be able to understand how and why the indicators are determined and interpreted. This is intended to ensure acceptance of the data and the required measures, e.g. when limits are exceeded.
- In order to guarantee effective risk management, it is essential to monitor risks continuously and to initiate clear control processes in time. Therefore, credit decision and credit portfolio management should be closely linked to limit monitoring.

The limit system should be developed bearing in mind the requirements of risk controlling and the bank's capacities (for example with regard to the models applied in risk measurement).

The definition of limits requires a number of decisions:

- First of all, it is necessary to define the structure of the limits. Limits can be defined to manage portfolio risks, product risks, country/industry risks, credit rating distributions, or individual transaction risks.
- Second, the method used to calculate the limits must be defined. In practice, one can find volume limits and risk-based limits - for example on the basis of VaR values or risk values determined in the course of a scenario analysis.
- Third, the point at which the compliance with the limits should be reviewed has to be defined - whether that should be done before or after approving the credit. This determines if a transaction is generally not concluded if there is a risk of exceeding the limits, or if the bank enters into this transaction based on its potential benefits and then reduces the related risk using risk controlling instruments.
- Finally, the rigidity of the limits must be defined, i.e. whether they are to be strictly observed at any time, or whether they are to be regarded as early warning indicators.

In addition to working out the limit structures, it is necessary to define processes to monitor the limits and to carry out and review countermeasures. The specific design of the limit system is discussed below.

3.6.2 Design of the Limit System

3.6.2.1 Limit Structure

The maximum risk limit is determined by the capital allocated to cover credit risks in the planning process. For this purpose, the overall credit risk limit must be divided into sub-limits. The first step is the distribution of the bank's overall limit to individual sub-portfolio limits. Sub-portfolios may include, for example, business units, customer groups, or regions. The bank's organizational structure has a significant impact on the way in which the limits are designed. One important success factor in the effective use of limits for risk controlling purposes is that a unit or an employee has the appropriate responsibility for an organizational unit which is assigned a limit. This is the only way to ensure that compliance with the limits is monitored and suitable measures are taken.

In practice, further sub-limits are defined beyond the sub-portfolio limit. Besides the types of limits mentioned above, there are further limit categories:

- product, business area, country, and industry limits
- risk class limits
- limits on unsecured portions
- individual customer limits

Product limits can be defined, among other things, for loans to retail and corporate customers, for real estate loans, as well as for project finance. Banks with an international focus can also define *country limits* in order to manage their risks arising from transactions in other regions. They also define *industry limits* in order to avoid a concentration of risks in individual industries that are subject to a degree of risk depending on the business cycle.

Monitoring and limiting the concentration of exposures in certain risk classes is necessary to be able to detect a deterioration of the portfolio in time, and thus to be able to avoid losses as far as possible by withdrawing from certain exposures. Therefore, many banks apply limits to the distribution of the portfolio to their internal rating classes. Risk limits are usually observed in combination with other limits. These “combined” limits allow more accurate risk controlling by means of stipulated limits.

The definition of *limits for unsecured portions* restricts loans that are granted without the provision of collateral or which are collateralized only partly. These limits allow banks to manage their maximum risks efficiently, as it is easy to determine and monitor unsecured portions. The control effect of limits on unsecured portions can be increased further by differentiating in terms of rating classes. This is done by defining the limits for unsecured portions in the lower rating classes more narrowly than in the higher classes. Limiting the unsecured portions sends a clear signal to sales and risk analysis to strive for the highest possible collateralization based on collateral of value, especially for loans of lower rating.

Limits for individual borrowers represent the most detailed level of risk controlling. The main purpose for their application is the prevention of cluster risks in the credit portfolio. The more precisely the limits are defined, the more

likely they are to yield control impulses that can be taken into account already at the time of approval of individual loans. If the bank is able to define and monitor limits at the level of the individual borrower that implicitly already include all other limits, then the credit approval decision – after analyzing the credit rating – can be taken already after examining this limits without the need to check the other limits explicitly.

3.6.2.2 Methods to Determine the Limits

It is necessary to define how to determine the limits for all the types of limits listed above. The method to be used is based on the availability of data and information on the respective type of limit and on the capabilities the bank has to calculate the risks. Furthermore, it needs to be considered how the risk can be managed.

Value-at-risk limits are risk-based limits that are set to curb unexpected losses and to ensure that they can be absorbed by the coverage capital. At the level of individual borrowers, the VaR concept can be applied only if the relevant historical data are available. For this reason, individual loan risks are often managed by using *volume limits* in practice. These limits are usually applied to restrict concentrations in certain rating classes, industries, etc. Many smaller banks also apply this indicator to (sub-)portfolios. From a risk perspective, VaR limits are preferable to pure volume limits as the latter assume a rigid connection between risk and volume, which does not exist in practice.

3.6.2.3 Rigidity of Limits

In order to allow the use of limits to manage risks, it is necessary to define how strictly these limits should be applied. In practice, the rigidity of limits varies in terms of their impact on a bank's business activities.

- Certain limits are defined rigidly and must never be exceeded, as otherwise the viability of the bank as a whole would be endangered.
- In addition, there are early warning indicators that indicate the risk of exceeding limits ahead of time.

This differentiation ensures that control signals are sent out not only after the (rigid) limits has been exceeded, but that early warning indicators point out the risk of exceeding a rigid limit in time to make sure that appropriate countermeasures can be taken immediately.

3.6.3 Limit Monitoring and Procedures Used When Limits Are Exceeded

Limit monitoring has the task of examining if the defined limits are complied with at the level of the individual loan as well as at the (sub-)portfolio and the overall bank level. All relevant limits are taken into account in this context. Limit monitoring is usually carried out by the units in charge of risk management control as part of risk monitoring.

The stipulated limits can have a direct impact on the credit approval. It needs to be determined if compliance with the limits should be examined before or after the credit decision is taken. In practice, this compliance is usually checked *ex post*, i.e. after the credit approval based on the portfolio under review, and is not a component of the individual loan decision. The credit decision is taken based on the borrower's credit standing and any collateral, but independently

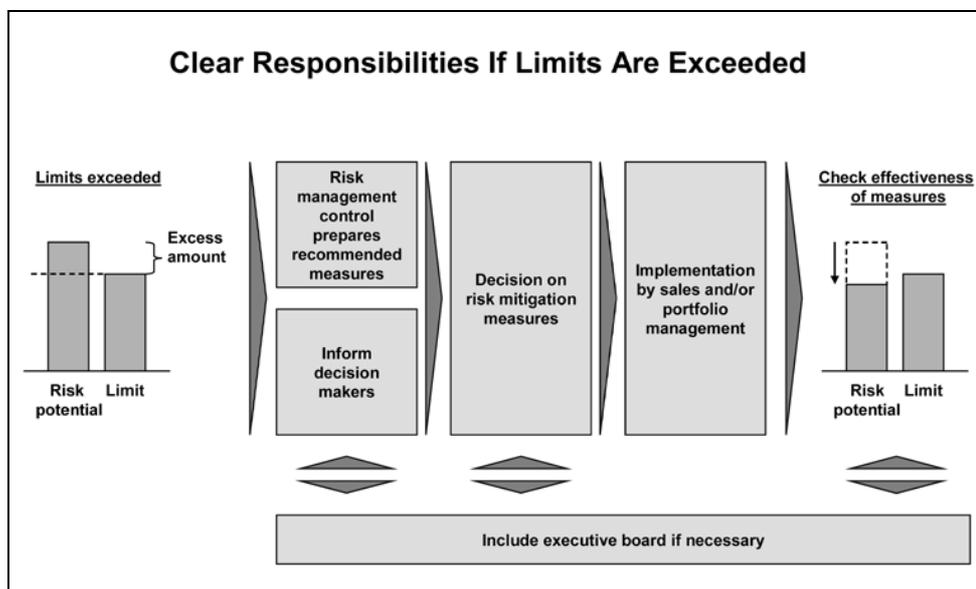
of the portfolio risk. Such ex-post observation can result in a relatively high number of cases in which limits are exceeded, thus reducing the effectiveness of the limit stipulations. This also creates additional organizational effort if limits exceeded in credit transactions require risk controlling to take corrective measures afterwards. Moreover, a necessary adjustment of the portfolio, e.g. by using derivatives, leads to hedging costs that reduce the lending income. Therefore, it needs to be ensured that at least the cost of hedging is taken into account in calculating the credit conditions.

Some banks check the compliance with the limits immediately during the credit approval process. Prior to the credit decision, compliance with the relevant limits is checked in case the credit is approved. Bringing limit monitoring into play at this early stage is also referred to as “*ex-ante*” monitoring. This helps prevent the defined limits from being exceeded in the course of approving new loans. Furthermore, the ex-ante observation offers the advantage that the portfolio can be streamlined by limiting new business from the start. This approach ensures that the portfolio – at least in the medium term – is aligned with the target structure defined as part of business orientation and risk strategy. The need for later portfolio adjustments and the related cost can thus be reduced sharply. This preliminary check, however, requires the bank to have functional measurement concepts that are suitable for assessing the impact of individual transactions on the portfolio structure and the resulting risk situation. Ex-ante monitoring is quite complex:

- It must be supported by appropriate IT systems.
- The coordination of sales and limit monitoring must be incorporated in the credit decision process.

As a practical temporary solution for banks that have so far carried out ex-post limit monitoring, the restriction of ex-ante checks to large exposures seems advisable. These are analyzed by the risk management control department prior to the credit decision as to their impact on the overall risk situation and the possibility that the limits may be exceeded. All other exposures are checked ex post. In the long run, all exposures should be subject to ex-ante monitoring.

The limit utilization has to be documented in the credit risk report (see section 3.7.4.1). Processes and responsibilities concerning measures to be taken when limits are exceeded have to be defined clearly. The decision makers responsible have to be informed depending on the extent to which the limits are exceeded and the approach taken to remedy the situation. The responsibility for the process lies with the risk management control department; this unit informs sales - and, if necessary, the head of risk management – and works out suggestions to mitigate the risk. After the measures are coordinated, they are implemented by portfolio management and checked for their effectiveness by an independent party (see chart 26).



3.7 Risk Controlling

In contrast to the management of market risks - which can be implemented quite fast due to the liquidity and tradability of the underlying exposure and the hedging instruments – credit risk requires elaborate risk controlling. This results from

- the lack of liquidity in credit trading;
- the emerging market for hedging instruments;
- time-intensive process steps in the securitization of credit risk; and
- partly unsophisticated methods of measuring credit risk and simulating the hedging effect of the instruments used

The methods available in the market and the specific steps in risk controlling will be discussed in the following section.

It is the task of risk controlling to influence a bank's risk situation actively by

- defining limits
- risk-adjusted pricing
- using hedging instruments
- carrying out capital market transactions to shift risks or
- selectively reducing exposures

Risk controlling is part of the overall risk management process and follows the quantification and planning of risks, aiming to reduce the risks to a level which – according to the stipulations from the risk strategy – is manageable for the bank; it is handled by portfolio management.

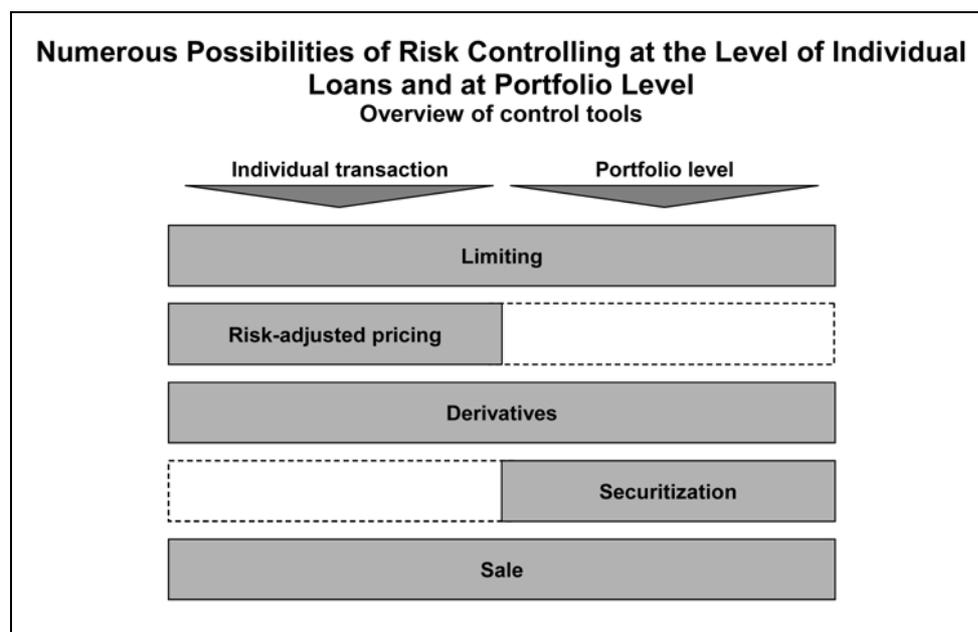
Risk controlling is carried out at the level of the individual borrower and at the portfolio level. There are numerous instruments that can be used in risk controlling. Depending on the situation, every bank has to determine what instruments can be used economically and may help reach the state intended by the bank (see chart 27).

The impulses for risk controlling are generated from the comparison of planned and actual risk situation and risk strategy. This comparison is the

responsibility of the risk management control unit. If the limits are exceeded, risk management control has to suggest measures to mitigate the risks. The actual risk situation and the measures to be taken as well as their effect on the risk situation have to be documented in a risk report. In the course of risk monitoring, finally, it must be checked if the intended change was achieved, and if the risks lie above or below the limit defined within the risk strategy.

Following the presentation of risk controlling instruments, we will discuss the requirements and processes of risk reporting.

Chart 27



3.7.1 Portfolio Delineation and Exposure Allocation

It is necessary to split the total portfolio into sub-portfolios to be able to measure and manage the credit risk effectively. This division is usually based on the homogeneity of the loans. Homogeneity means that the loans are comparable in terms of the risk associated. Thus, for example, consumer loans are homogeneous. The allocation of loans to sub-portfolios should not have any negative impact on sales processes. This means that, for example, customers should only be assigned to one account manager even if their exposures would have to be assigned to different portfolios.

The definition and delineation of the sub-portfolios should be derived from the business strategy and the customer groups named therein. Based on the guidelines of Basel II, the segmentation – as also described in section 2.2.3.6 – may show the following structure:

1. sovereign exposures
2. bank exposures
3. corporate exposures
4. retail exposures
5. equity exposures

The assignment to a sub-portfolio is effected by the portfolio management unit, as this unit is responsible for the risk controlling of the sub-portfolios.

3.7.2 Managing Individual Loans

In practice, banks manage the approval of new loans depending on how well the loan fits into the target portfolio structure and on whether it is in line with the intended risk-return ratio. The bank aims to include only such loans in the portfolio that match the bank's business orientation and that can be priced in a way that adequately reflects the risk involved.

To this effect, risks at the level of the individual loan can be managed by two main parameters – by *limiting* individual exposures and by portfolio management setting *prices that reflect the risk adequately*. As the limiting aspect was already dealt with in more detail in section 3.6, the following section focuses on the setting of prices.

3.7.2.1 Significance of Setting Prices That Reflect the Risk Adequately

In many cases, the risks involved are not scrutinized sufficiently in the credit approval process. To some extent, this can be seen as the intentional business decision to sell loans at normal conditions to certain customers with a view to generating future business. Often, however, it is the lack of sufficient data for the calculation of the risk cost that prevents the setting of prices which reflect the risk adequately.

Setting the price on the basis of the borrower's credit standing and the effect on the portfolio risk represent an important control impulse for the sales unit. If banks that are able to set risk-adjusted prices encounter competitors that are unable to do so due to less sophisticated risk measurement methods, the so-called adverse selection effect may occur. This means that borrowers with a lower credit rating will tend to choose those banks which are not able to determine an individual price for the risk associated with that borrower; therefore, those banks will only be able to charge average prices that favor bad ratings over good ones.

Thus, a bank's competitiveness can be improved significantly by implementing the systems necessary to set prices reflecting risks adequately.

3.7.2.2 Components Determining the Price

Among other things, the margin of a loan is determined by the following factors:

- cost of processing the loan
- cost arising from a possible default of the loan
- cost of capital requirements

Processing cost is included in the price calculation as so-called unit cost. In practice, determining this price component poses a challenge for banks, as it is usually difficult to assign the cost of processing to individual loans according to its source.

Various data are required to determine the potential *cost of default* of a loan; these include:

- data about the credit standing (probability of default) of the borrower
- data on the exposure at default
- data about the value of collateral that can be sold to reduce the loss in case of default

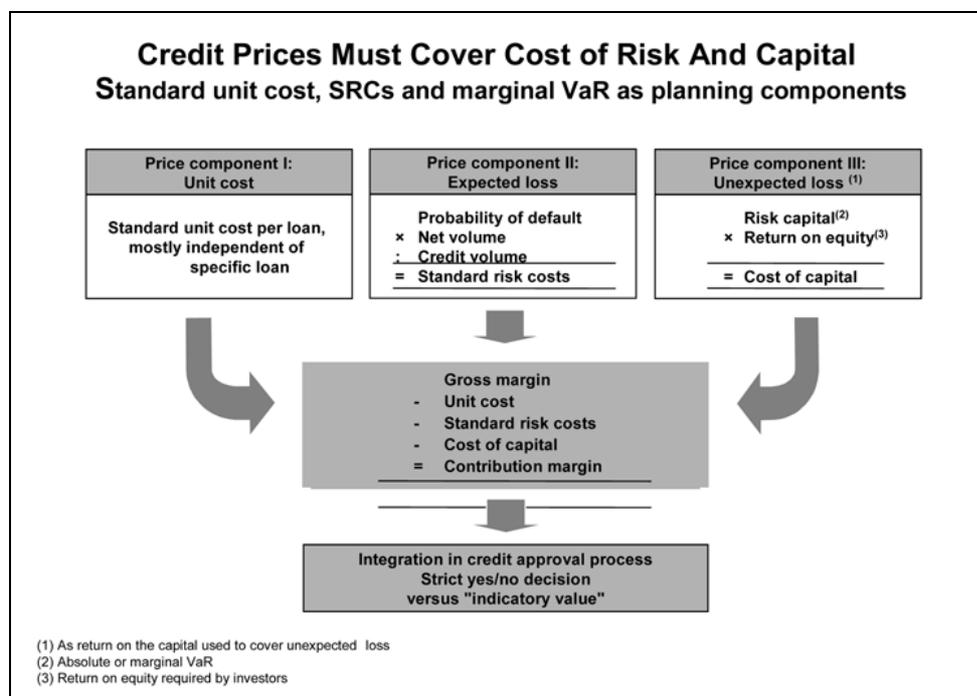
The bank usually calculates so-called *standard risk costs* (SRCs) for each type of loan and each rating class. The standard risk costs show the average magni-

tude of losses compared to the credit volume of a certain period in the past. The loss is the probability of default multiplied by net volume, which results from the difference between the credit amount outstanding and the realization proceeds from the collateral and/or the liquidation proceeds of the company and/or other repayments.

The third component of the margin, i.e. capital cost, refers to the capital requirement to cover the economic risk of the loan. Taking into account the imputed cost of the capital required serves to cover the desired return on investment of the bank's owners which is based on the target RORAC.

Chart 28 illustrates the price components:

Chart 28



The credit price is affected not only by the individual borrower's risk, but also by the bank's current portfolio structure. The inclusion of an individual loan in the portfolio could change the portfolio's overall risk. Thus, a loan may actually reduce the total risk by diversifying the portfolio. However, the loan can also increase the concentration – in terms of industry or rating class, for example. The change in the risk is determined by applying a VaR analysis and is referred to as *marginal VaR*. In contrast to the absolute VaR of an individual loan, which is calculated on a stand-alone basis, the marginal VaR takes into account the effect of an individual loan on the portfolio risk. Some banks, for example, use the marginal VaR to calculate the economic capital necessary to cover the individual loan and calculate the imputed cost of equity capital on this basis.⁵¹

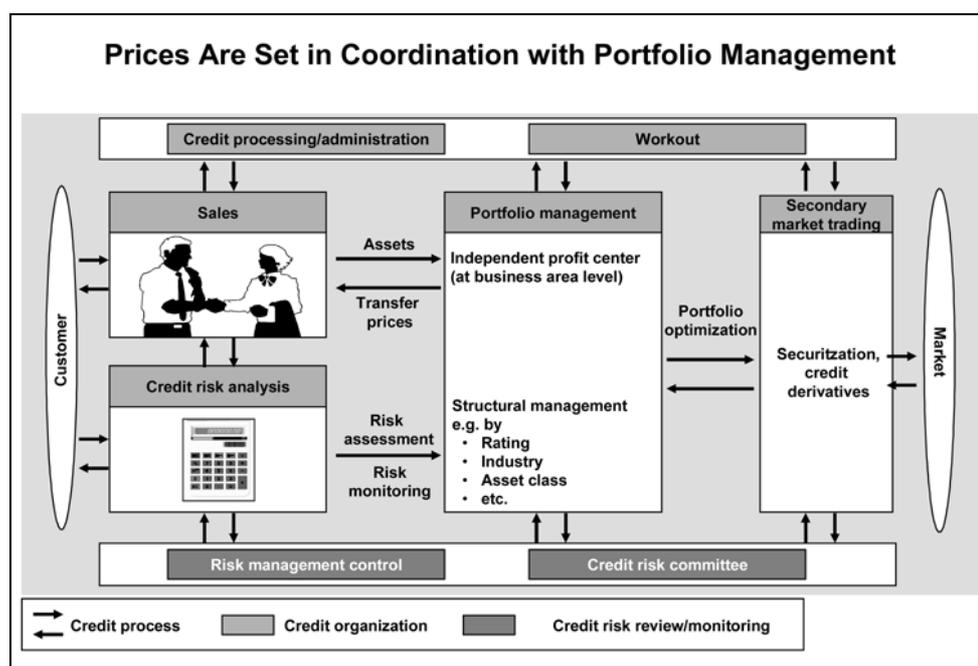
⁵¹ There exist further methods to calculate risk of an individual transaction which can be found in the relevant literature. The marginal VaR has to be looked at cautiously, as it clearly overstates the correlation effect of individual loans in the aggregation due to double counting. The sum of the marginal VaRs of the individual transactions is therefore usually smaller than the VaR of the total portfolio.

In order to make the calculation of the price components feasible, input parameter data are required for the last three to seven years.

3.7.2.3 Pricing Process

The standard risk costs and the cost of capital are calculated by portfolio management on the basis of the results provided by credit analysis and portfolio structure and are then submitted to sales as a guideline. Ideally, sales will check the price with portfolio management prior to approving the loan and will then be informed about the conditions based on the above-mentioned criteria which take into account the current portfolio structure. For low-volume loans, this requires a computer-based and automated pricing process. In practice, however, such systems are used rather for high-volume credits such as project finance; in these cases, the prices are calculated in accordance with current market conditions and coordinated with risk controlling. For smaller loans, however, there are usually fixed conditions – which are, however, adjusted at regular intervals – that have to be applied in terms of standard unit costs, standard risk costs, and cost of capital. Chart 29 illustrates the coordination between sales and portfolio management in the credit approval and pricing processes.

Chart 29



As mentioned before, prices must be adjusted at regular intervals. While sales is likely to prefer longer validity periods for the loan conditions, portfolio management will require shorter periods; the views will have to be harmonized.

The prices set by portfolio management must usually be regarded as fixed; deviations should occur only in exceptional cases and if the necessary authority exists. The option to define conditions that may lie below the economically necessary price offers sales the latitude to view the customer relationship from a holistic perspective, i.e. inclusive of other income. Thus, the loan may be sold

below margin, but other products generate enough margin to render the customer relationship profitable overall.

However, it is necessary to handle this intervention option restrictively. In practice, it shows that the expected *cross-selling proceeds* cannot usually be realized in the amount intended, leaving the bank with a loss from the customer relationship. For this reason, standardized customer transactions should be subject to rigid price setting with a view to making each product profitable in itself. In private banking, some banks ignore the profitability of an individual product, as cross-selling process are more likely to be realized in this segment, making the overall customer relationship profitable even after deduction of risk costs. Still, it may be necessary to restrict any excessive undermining of conditions in this segment; this may be done, for example, by defining a *subsidy budget* which is used to offset the imputed losses from loans that do not cover their cost. This budget is limited and has to be agreed with the sales employee in connection with planned income every year. At the same time, the budget allows the bank to monitor the cost of undermining the credit conditions and to take appropriate measures, if necessary.

3.7.3 Managing the Portfolio

Risks have to be measured, monitored, and managed not only the level of the individual loan, but also at a portfolio level. This is due to the fact that the individual credit risks of a portfolio are usually correlated. Two risks are said to be correlated positively if both risks increase or decrease on a change in the underlying risk factors, and correlated negatively if one of the risks decreases while the other increases. This means that measuring *correlation* is of great significance in determining the total credit risk, as the sum of the individual risks usually does not simply equal the total risk as a result of these correlations. *Diversification*, i.e. spreading the positions of a portfolio among different industries, regions, rating and size classes that show little or negative correlation, helps reduce the portfolio risk. By contrast, concentrations in certain industries, rating and size classes increase the credit risk.

The use of financial instruments or the sale of loans makes it possible to specifically manage the portfolio's degree of diversification and thus its risk profile. The section after the next one will discuss the most important instruments.

Active portfolio management represents the combination of bank-wide capital allocation and the management of individual credit risks. It creates the conditions that are needed not only to measure, aggregate, and monitor risks, but also to influence them actively.

This active management requires the bank to be able to measure risks at the portfolio level and to analyze the way in which individual management instruments affect the risk situation. The following section is intended to offer an overview of those portfolio models currently used which meet this requirement. This is followed by a presentation of instruments that can be used to manage portfolio risks.

3.7.3.1 Use of Portfolio Models

Portfolio models are used to determine the risk of a credit portfolio. The following aspects have to be taken into account:

- the *individual credit risks* in terms of their probability of occurrence and the associated loss;
- the *correlation* of these individual risks at a portfolio level

These input parameters are used to estimate the loss distribution for the total portfolio in order to derive expected and unexpected losses.

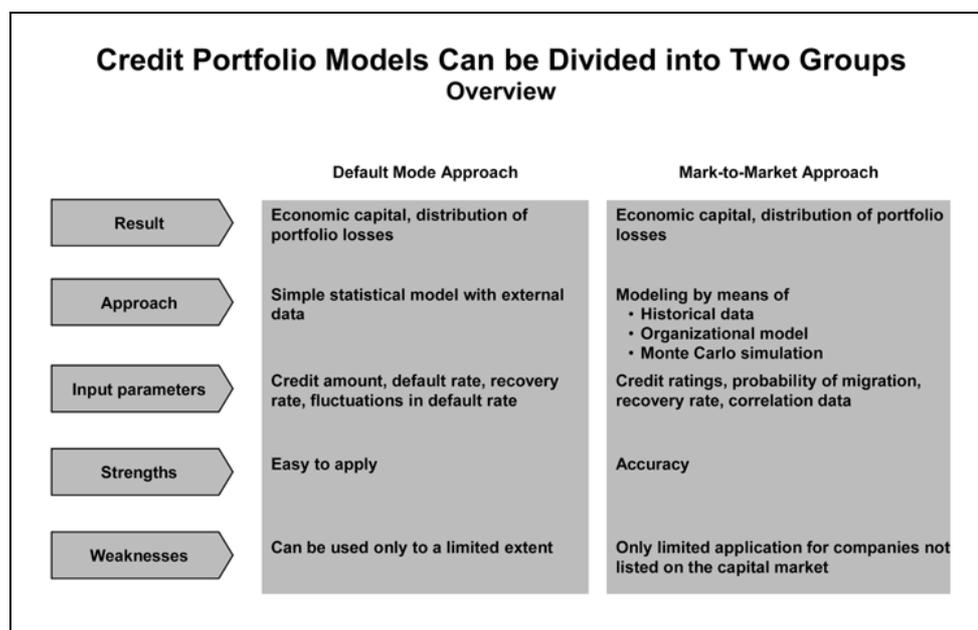
Due to insufficient data, one of the biggest weaknesses of the credit portfolio models currently available in the market is the problem of determining the correlations in an accurate fashion. The major difference between the models is the way in which the correlation values are derived and applied. Simplifications are used that assume, for example, the non-existence of correlations between borrowers from different industries or the stability of input factors over time. Other major differences can be found in the selection of the required input parameters and the modeling approaches.

In the following, we would like to give an overview of two model types that differ in terms of modeling approaches and the integration of correlation effects:

- default mode models and
- mark-to-market models

Chart 30 shows an overview of the most important differences between the two approaches. Elaborate discussions of the theoretical foundations of these models can be found in the relevant literature.⁵²

Chart 30



⁵² This issue is discussed in the 1998 OeNB publication "Credit Risk Models and Credit Derivatives", download available at http://www2.oenb.at/pdfdown/bankenaufl/credit_risk.pdf

Default mode models

Default mode models distinguish only two states:

- default
- and non-default of the borrower

These two states are assessed in terms of their probability of occurrence to determine the loss given default. The input parameters for this model class are derived from internal data or complemented by assumptions for unavailable data. External data that, for example, reflect the business cycle, are usually not taken into account.

Important input parameters for default mode models are

- the loan amount;
- the default rate of the loan and its fluctuation;
- the recovery rate, i.e. the proceeds that can be achieved when selling the collateral used for cover; and
- the correlations (assumed to be constant) between the default risks.

Possible fluctuations in the recovery rate and changes in the borrower's credit standing are usually not simulated. The statistical analysis yields the loss distribution of the portfolio.

The advantages of default mode models are their ease of use and the relatively low data requirements. On the other hand, the limited precision – due to the small volume of processed data – proves to be a disadvantage.

Mark-to-market models

Mark-to-market models evaluate credit portfolios in terms of their market value and the risk the bank incurs if the market value changes. The evaluation includes the same parameters that are used in default mode models, but it also takes into account the *changes* in the borrower's credit standing and often also in the recovery rate over time, as well as the correlations of the credit risks. The changes in rating and value of collateral are modeled on the basis of various procedures, by using internal historical data, a Monte Carlo simulation, or procedures based on option pricing theory. Including the changes in the borrower's credit standing means that it is possible, in addition to the two states of default or non-default, to calculate rating migration probabilities.

The possible market values of the individual loans are calculated by discounting the future cash flows. The impact of the rating on the loan value is taken into account by using different discount rates that are derived from the credit spreads of different bonds traded in the bond market.

The potential changes in the value of the loans calculated in this manner are combined with the probability of occurrence of the rating changes, and this is used to calculate the volatility of the loan value. The volatilities of the individual loan values are combined taking into account the correlations between the borrowers and consolidated to yield the portfolio risk.

The advantage of the mark-to-market model is that – due to the various parameters and the fact that they can easily be modeled – the actual portfolio risk can be shown far more accurately than is possible using default mode models. In practice, however, it is not always easy to apply mark-to-market models as all the data required are not available, and calculating the values takes a lot of time depending the portfolio's complexity.

3.7.3.2 Instruments of Active Portfolio Management

Measures to change the risk situation have to be taken if the analysis of the portfolio risk shows that the total risk exceeds the coverage capital, or if this is mandated by the bank's business and/or risk strategy. The three instruments of active portfolio management used most commonly in practice will be discussed in detail below:

- credit derivatives
- securitization of loans
- buying and selling of loans

Credit derivatives

Credit derivatives are financial contracts that allow the transfer of credit risks. Their applications are numerous – they can be used to hedge individual loans or the portfolio risk as a whole. The hedge can cover the entire risk of default, i.e. the risk that the loan cannot be repaid, or the risk of deterioration of the credit quality.

The basic function of a credit derivative distinguishes between the protection *buyer*, who receives cover in return for a premium, and the protection *seller*, who assumes the risk from the loan in return for receiving a premium. In addition to hedging individual loans or portfolios, there are synthetically generated underlyings, e.g. a defined basket of reference bonds or indices that reflect the change in value of corporate bonds. In order to determine the due date of compensation payments, it is necessary to define so-called *credit events*. Depending on the structure of the derivative, one can distinguish between

- insolvency of the borrower;
- default on interest and/or principal repayments;
- reaching certain (external) ratings; and
- exceeding certain spreads for listed corporate bonds

There are a number of underlyings in the market than are hedged by derivatives. Besides bonds issued by large corporations, banks, and sovereigns, individual loans to large corporations can also be hedged. Increasingly, loans to SMEs and credit portfolios of private customers are covered against unfavorable changes in value. The last two underlyings, however, often lack an objective assessment, e.g. based on external ratings, which makes it difficult to hedge them.

Settlement can be effected physically or financially. In the case of physical delivery (physical settlement), the loan claim or the defined portfolio is transferred to the protection buyer in the credit event; in the case of cash settlement, the predefined monetary amount is paid to the protection buyer. This sum can be defined as the difference between the value of the claim before and after the credit event or as a fixed amount independent of the loss in value which is actually incurred.

The instruments available in the market can be subdivided into the following classes:

1. credit default swaps
2. credit-linked notes
3. credit spread derivatives
4. total return swaps
5. hybrid instruments

1. *Credit default swaps* are based on a default of the borrower. Default does not necessarily mean a total default of the entire loan claim, it can also just refer to delay in payments. In such a case, the protection buyer will typically receive payment in the amount of the loss incurred.

2. *Credit-linked notes* usually combine the features of a regular bond and a credit default swap. The combined bond is issued directly by the protection buyer in most cases. In case the credit event occurs, a specified amount is deducted from the repayment of the bond amount. Should the credit event not occur during the term of the bond, the bond is repaid in full. Thus, the compensation payment is the difference between the bond's nominal value and the amount that actually has to be repaid upon maturity.

3. *Credit spread derivatives* hedge losses arising from deterioration in the borrower's credit standing. The reference assets are usually listed corporate bonds or indices. The bonds do not have to be part of the protection buyer's portfolio. A hedge of the credit portfolio takes effect when (external) liquid reference assets are selected that reflect the development of the portfolio's value in the event of a rating deterioration. Settlement will be effected if a certain spread limits is exceeded.

4. *Total return swaps* cover the entire loss resulting from a change in the underlying's market value. Changes in market value can be caused by a default or a rating deterioration of the company, but they can also result from a change in general market liquidity or an increase in the yield level.

5. *Hybrid instruments* are combinations of the basic forms just described.

There are basically no restrictions on the stipulations credit derivative contracts may contain. Therefore, the instruments available in the market are numerous and can be adapted to any requirements the protection buyer and seller may have. While the low degree of standardization of these contracts must be regarded as positive in this respect, it does have a negative impact on the liquidity and marketability of these products.

Credit derivatives are used not only to hedge the risks associated with existing credit exposures, they are also employed to increase the degree of diversification of portfolios or to generate additional income from the premium or from speculation.

The advantages of hedging the credit risk by means of derivatives are their ease of use and the fact that credit event, underlying, settlement, maturity, etc. can be arranged individually. This allows the best possible integration of the derivative in the institution's existing or intended risk profile. A successful application of a credit derivative is contingent upon the fact that its effect in terms of its hedge function can be calculated accurately by using portfolio models. A further advantage is that the derivatives make it possible to separate the credit risk from the claim, which means that – in contrast to a sale of the loan – the claims need not be transferred, thus not requiring notification of the borrower. The use of derivatives appears preferable also compared to the securitization of loan claims, as the required transaction is less complex and therefore usually less expensive.

One disadvantage of credit derivatives is that banks looking to acquire protection incur a new credit risk, i.e. the risk of default of the contracting party. This risk must be taken into account in the calculation of the hedge effect.

Securitization

In the case of securitization, selected loans are transferred to a company set up for the purpose of securitization (special purpose vehicle, SPV).⁵³ The transferred portfolio is divided into tranches with different rating classes and is refinanced by the SPV by issuing securities to investors. The securities are linked directly with the default risk of the tranche they securitize. Often, the securitizing bank has to provide additional collateral or liquidity facilities to make the securities attractive for investors. Furthermore, the bank will usually have to keep the “first loss piece” on their own books; this first loss piece is roughly equivalent to the portfolio’s expected loss. Thus, only the risk of *unexpected* rating deterioration is passed on to the investors. The bank usually remains responsible for servicing, which includes monitoring the receipt of payments and the collection of claims due.

Securitization is particularly suitable for homogeneous portfolios. The evaluation of portfolios is also difficult in the context of securitization; this is especially true for loans to corporate customers which require an individual rating. Retail customer loans and loans to SMEs, however, pose fewer problems in terms of their assessment, as there are standardized credit rating procedures that are based on readily available customer data. Furthermore, the relatively small size of the loans results in correlation effects that further reduce the portfolio risk.

Selling loans

When loans are sold, they are placed directly with one or more investors and are thus also removed from the balance sheet. For this purpose, the individual loans to be sold are selected and combined in a portfolio. This portfolio then has to be evaluated, and the investors have to be furnished with detailed information to enable them to assess the risk of the individual loans. The expected default rates of the individual loans are included in the evaluation. The buyer will usually only be prepared to buy the portfolio if the discount on the nominal value of the loans covers at least the losses from the expected defaults, possibly including a haircut, the cost of refinancing, as well as the return on equity required. Finally, the purchase price is negotiated and the contract of sale is concluded. When the loans are sold, the risk of default and the responsibility for servicing are transferred in full to the buyer.

The selling of loans is a long-winded process as it is often difficult to find a buyer. The main reason is the lack of transparency concerning the evaluation of the portfolio. It is not always possible to come to terms concerning the evaluation, as the buyer is usually unable to check all the information required, particularly information about the borrowers’ credit standing. By contrast, individual loans lend themselves to being sold as their risk is usually easier to assess than the risk of a portfolio. The complexity of the sales transaction, however, makes it relatively expensive, which means that it only makes economic sense to sell loans that are sufficiently large. Therefore, the sale of portfolio and individual loans should always be assessed bearing in mind the benefit it creates – in

⁵³ *Securitization is shown at the example of a true sale transaction. At this point, we would like to refer to our guide on “Best Practices in Risk Management for Securitized Products”, which was published in the same series.*

terms of risk reduction – and the cost incurred. In addition, it needs to be considered whether other instruments would not be just as effective but more suitable. Thus, the sale of loans is usually only the last resort.

3.7.4 Risk Reporting

3.7.4.1 Risk Report

Detailed information about the risk at the level of the individual loan and at a portfolio level are required to manage the credit risk effectively. It is the task of risk reporting, a unit independent of the market division, to consolidate and process the information related to risk controlling and to aggregate it into a *risk report* covering the following four areas:

- The report has to show the development of the total portfolio and the sub-portfolios in terms of risk; furthermore, important individual positions have to be elaborated on.
- The need for action, that is mainly risk mitigation measures, results from the assessment of future market trends, the coordination with risk-bearing capacity and risk strategy, as well as findings from analyzing the competition.
- At the same time, it has to show how the measures will affect the bank's risk situation, who is responsible, and what the deadline for the implementation of the measures is.
- Furthermore, the effectiveness of the processes and measures should be discussed.

The report's level of detail has to be adapted to the information required by the recipient in each case. This would require an analysis as to the needs of the respective decision-making levels, resulting in the preparation of reports in accordance with those needs. In its full version, the credit risk report should contain all levels of detail to ensure that the data communicated within the bank are consistently available for all levels of detail should those data be required in the decision-making process. The following excursus shows an example of a credit risk report.

Excursus: Risk Report

A. Management Summary

A first overview summarizes the most important details concerning the risk situation, which will be discussed in more detail in the subsequent sections. The management summary offers an overview of the most important indicators. They are intended to show whether the bank operates within the predefined framework as far as the total credit risk is concerned, and whether it complies with the risk strategy. The most important indicators are:

- *VaR and the development of the total portfolio*
- *limit utilization*
- *capital utilization*
- *risk provisions/risk-bearing capacity*
- *expected defaults*
- *extent of unsecured portions*
- *largest exposures at risk*
- *term and collateral structure*
- *new business/new types of business*

The indicators will be dealt with in detail in the following chapter 3.7.4.2.

B. Main Part

This part gives a detailed description of the major indicators outlined in the first part and shows the most important developments in the credit portfolio. This should contain at least the following information:

- a. development of the entire credit portfolio according to important structural characteristics, particularly industries, countries, risk classes, and size classes;
- b. extent of the limits stipulated and their utilization;
- c. individual exposures with significant risk levels and their collateralization as well as other remarkable exposures;
- d. term structure including the collateralization structure aggregated by maturity;
- e. significant overdrafts;
- f. development of new business and new types of business;
- g. development of risk provisions with regard to risk-bearing capacity;
- h. credit decisions exceeding certain volumes which deviate from the credit risk strategy;
- i. credit decisions taken by executives within their individual credit authority to the extent they deviate from the votes or if they were taken by an executive not in charge of the market division;
- j. unsecured portions sorted by structural characteristics;
- k. development and utilization of capital;
- l. expected defaults.

Taking into account the development of the market and assuming that the current structure will be maintained, the expected development of bank's risk situation is analyzed. Consequently, possible courses of action are suggested and examined in terms of their effect on the portfolio. The possible courses are assessed, with one or more alternatives then being submitted for consideration.

C. Notes

The notes to the risk report contain a detailed description of the individual risk components and their historical development. Furthermore, the courses of action outlined briefly in part B are evaluated in detail and their impact is shown by means of the portfolio models used or other measurement procedures. Similarly, the notes should include individual analyses and special reports that cover unusual risk situations or, for example, show the distribution of the portfolio across rating classes and industries. All the information required to evaluate the bank's risk situation should be found in the notes.

The *first* and *second levels of management* will receive rather condensed information which they can use to make decisions based on the recommended courses of action. The *units* responsible for the bank's credit risk management as well the respective market units will receive additional and detailed information on the risk positions for which they are responsible.

The *individual employees* in sales and risk analysis receive information about the exposures they manage and administrate; they do not receive the full risk report, however.

This risk controlling information must be provided *regularly* and *expeditiously*, distinguishing between routine information and ad-hoc information.

- *Routine information* is generated in the process of regular reporting on the risk situation. These reports ensure the monitoring of limit compliance at the levels of the total portfolio, sub-portfolio, and the individual borrower, and align the risk positions with risk provisions and risk-bearing capacity.

The executives should be informed about the *major* indicators no more often than every month, but at least every quarter. Monitoring the total risk should be documented in detail at least every quarter. A *comprehensive* risk report has to be prepared at least once a year.

- *Ad-hoc reporting* is required in the case of events with a considerable risk level affecting the credit institution, especially if the risk situation is changed significantly and abruptly, that require immediate action; examples include considerably exceeded limits or rating deteriorations for individual exposures with a significant risk level, a major need for risk provisions, indications of deficiencies in the organization or the systems and procedures used. Depending on the decision-making structure and the extent of the risk situation, the decision maker affected will be informed and provided with a recommended course of action; if such events are of significance for the credit institution as a whole, the executives will be informed in the same way. In order to allow immediate action to mitigate the risk, it is essential to pass on such information immediately, i.e. whenever changes in the risk occur.

3.7.4.2 Indicators

This section will briefly outline the most important indicators in terms of their relevance and benefit. The indicators are delineated according to possible recipients (see charts 31 to 33). This depiction does not claim to be exhaustive.

Chart 31

Input Parameters from a Bank-wide Perspective Executive Board/Credit Risk Committee		
Input parameters	Output	Benefit
Return on Equity/RORAC	Ratio of profit to equity/economic capital	Necessary to monitor reaching target profitability
Overview of development of Value-at-Risk	Risk measure for unexpected losses in the total portfolio	Necessary for comparison with coverage capital
Overview of limit utilization/utilization of coverage capital	Comparison of limits defined in the risk strategy/risk capital with risks	Creates input parameters for risk reduction if limits are at risk of being exceeded
Concentrations	VaRs/volumes of loans with identical characteristics (industry/risk class, etc.)	Makes it possible to observe and manage cluster risks
Specific loan loss provisions vs. Actual and expected defaults	Ratio of provisions for expected losses	Shows if losses can be absorbed by provisions or have to be deducted from coverage capital
Equity utilization	Aligning regulatory capital requirements with available equity	Creates input parameters for risk reduction in case of insufficient cover
Liquidity status	Analysis of residual maturities of the credit portfolio and comparison with refinancing funds	Serves to secure the bank's liquidity

Chart 32

Input Parameters from the Perspective of Sub-Portfolios Department/division management		
Input parameters	Output	Benefit
Composition of sub-portfolios in terms of ratings, industries, countries, etc.	Detailed depiction of risks in the sub-portfolio	Allows the comparison with limits to determine specific controlling impulses
Development of VaR	Risk measure for unexpected losses in the overall portfolio	Needed for comparison with coverage capital
Concentrations	VaRs/volumes of loans with identical characteristics (industry, risk class, etc.)	Makes it possible to observe and manage cluster risks
Unsecured portions	Share of unsecured exposures (or parts thereof) in the overall credit exposure	Serves to determine the maximum default risk in case of total loss
Overview of specific loan loss provisions vs. actual and expected defaults	Ratio of provisions for expected losses	Shows if losses can be absorbed by provisions or have to be deducted from coverage capital

Chart 33

Input Parameters from the Perspective of Individual Exposures Account manager/credit analyst		
Input parameter	Output	Benefit
Development of the individual borrower's credit standing over time	Comparison of the borrower's ratings throughout the lifetime of his exposure	Serves to recognize early warning signals and set up or modify provisions
Development of standard risk costs	Shows risk premiums to be charged by risk class, industry, etc.	Offers input parameters for sales and ensures coverage of expected losses
Development of industry and country risks	Shows risk premiums for borrowers based on industry or country of origin	Offers input parameters for sales
Development of collateral valuation	Assessment of proceeds that can be realized if collateral is sold	Serves to recognize early warning signals and may lead to a re-rating of the borrower

3.7.4.3 Integration in the Bank-wide Management Information System

In order to allow an efficient collection of information, risk reporting should be supported by the bank's IT systems, especially in data generation and analysis as well as in the assessment of impact. It has to be ensured that the data used are consistent with the information used for other reports (e.g. income planning).

Using management information systems, data on the bank's risk situation should be combined with data on the income situation to ensure that

- risk-adjusted income ratios are used;

- the effects of risk mitigation measures on the income situation can be simulated; and
- these effects can be included in the decision-making process.

3.8 Risk Management Systems

Risk management systems have to fulfill three main functions:

- the collection and processing of indicators in accordance with the information needs of the recipients;
- the analysis of changes in the portfolio value depending on changes in defaults in the credit business and the consolidation of these results into values that are relevant for risk controlling; and
- monitoring the risks to be able to detect ahead of time if limits are about to be exceeded.

As the implementation of modern IT-based risk management systems is very costly, special attention has to be paid to their integration in existing processes as well as to their acceptance on the part of the employees.

3.8.1 System Requirements

Effective risk controlling requires information from numerous areas. This information is provided by various systems:

- These include systems that manage information on the bank's portfolios, such as details about the distribution by rating class, industry, region, and level of concentration.
- Risk controlling also requires information on individual loans, e.g. about customers' credit ratings and the changes they undergo as well as information about the valuation of collateral and fluctuations in value during the period under review.
- In addition, information from accounting systems, such as the level of specific loan loss provisions or the volume of troubled loans, is needed.

Combining this information often proves difficult in practice, especially because the data definitions often diverge considerably. This divergence in the data definitions is marked by different forms of presentation and external requirements (in terms of legal, taxation, balance sheet, and economic considerations). Bearing this in mind, it is necessary to define *standards* for the data formats.

The systems should support the predefined reporting formats and provide the indicators in the required format (e.g. in accordance with the data definition or the intended period). Furthermore, these input parameters should be available in the systems at a general level (e.g. for the bank as a whole) but also at *more detailed levels*.

Wherever possible, information should be generated *automatically* to avoid errors from manual handling as far as possible. This automated operation has to be ensured by appropriate management of the interfaces between the systems.

Effective risk management is only possible if the relevant information is passed on to the decision makers *in a timely manner*. This has to be safeguarded by the systems.

Ultimately, systems should be able to initiate *information and management processes automatically* to a large extent. This is especially important in the area

of early warning. The specific demands on early warning systems are described in the next section; this is followed by a discussion of the tasks of risk controlling systems.

3.8.2 Risk Monitoring Systems and Early Warning Systems

Risk monitoring aims at checking compliance with the risk strategy and ensuring the effectiveness of counter measures. Early warning helps detect situations in which limits are exceeded or marked changes in the risk position, be it at the level of the total portfolio or individual loans, in time and it is used to generate warning signals for risk controlling.

Experience has shown: The earlier risks are detected, the more effectively they can be countered. In the individual loan segment, for example, the (partial) repayment of the exposure or the proceeds from the realization of collateral is usually higher the earlier the loan's risk of default is detected. The same is true at a portfolio level: The earlier it is realized that the portfolio's risks reach the limits defined under the risk strategy, the more effectively can be reacted. Warning signals should be generated before the limits are fully reached in order to make it possible to make use of all (levels of) risk mitigation measures. If the warning is generated in time, limits are not exceeded, and there is no need to approve such exceeding of limits in retrospect.

The information itself, however, is not sufficient; it is also necessary to trigger risk controlling processes in time. Thus, the requirements on risk monitoring and early warning system are, on the one hand, the timely, automated generation of warning signals, and the triggering of processes for increased risk monitoring or risk mitigation on the other.

3.8.3 Risk Controlling Systems

Risk controlling systems are used to capture the bank's actual and forecast risks, to align them with the limits and other guidelines of the risk strategy, and – based on this – to initiate measures that limit the risks if necessary.

Risk controlling systems are used to submit regular reports about the bank's risk situation to the hierarchical level in charge as a decision basis.

In order to make the management process effective, it is absolutely necessary that the systems generate an *automatic warning* if the defined limits are exceeded, initiate risk mitigation processes and – in case the limits are exceeded for an extended period of time – trigger escalation processes to the next decision-making level.

Sophisticated systems support the integration of risk management in bank-wide capital allocation. They ensure risk monitoring at the bank level and allow the evaluation of the performance of the underlying transactions for the purposes of RORAC management.

These systems are intended to establish a link between the management of individual transactions and portfolio management. All information concerning individual transactions are collected by the systems and made available to portfolio management and risk management control. Ideally, the systems link the credit approval decision with portfolio management in terms of defining conditions and limits.

4 Organizational Structure

4.1 Introduction

This chapter deals with options for the design of the organizational structure of a bank's credit organization. When designing an organizational structure, it is important to take into account not only the functions to be structured, but also in particular the number of the people working in those functions. Both criteria are affected by the business volume (type and number of transactions) of each bank. The number of possible designs, however, increases with the bank's business volume; therefore, some options are only relevant for large commercial banks. Still, the basic premises leading to these design options can also serve as an inspiration for smaller banks in designing a structure for their credit organizations. As an example, it might make sense to assign the functions specified in the following subchapters not to independent organizational units, but to employees that will specialize in these functions.

First, the introduction describes the functions that are typically handled by credit organization. The combination of the functions into function blocks that are defined by common core activities – processing and risk management⁵⁴ – corresponds to the structure of this chapter. The framework of the organizational structure covering the functional blocks is defined by the design of the management structure at the superincumbent level.

4.1.1 Functions within Credit Organization

The functions within the credit organization can be divided into three groups:

- sales
- risk analysis and processing
- credit risk management

The functional group of risk analysis and processing comprises four functions:

- risk analysis
- loan processing
- service functions
- restructuring/workout

Credit risk management covers three functions:

- central credit staff
- credit risk controlling
- portfolio management

Subchapter 4.3 outlines those functions which are directly related with risk analysis and processing of individual loan exposures. Subchapter 4.4 discusses the functions of the credit risk management block.

Other staff areas (e.g. management control, legal affairs, personnel, audit) besides the functions of credit organization dealt with here are also concerned with the credit organization. However, as the organizational structure of these areas heavily depends on the bank's overall business model, it is not possible to describe these areas without a specific definition of such a business model. Inter-

⁵⁴ *It is not possible to show the design of the structure of the sales organization, as this would not be possible without extensive reference to sales-related segmentation, which would clearly exceed the scope of this guide.*

nal audit and its role in the process review is dealt with separately at the end of this guideline.

First, however, we will look at international trends that can be observed in the design of credit organization structures.

4.1.2 International Developments

Four basic approaches can be observed in the structural design of credit organization:

- separation of sales and processing
- appointing a chief risk officer
- upgrading of risk analysis
- centralization

As far as these four items are concerned, it needs to be pointed out that in particular the appointment of a chief risk officer and centralization efforts only make sense for banks of a certain size.

4.1.2.1 Separation of Sales and Processing

At an international level, there is a clear tendency towards complete separation of sales (front office) and processing (back office, especially risk analysis) up to an executive level. This development is determined by two main causes:

- International regulations: First and foremost, Basel II and its implementation by the European Union have to be mentioned here; the “Principles for the Management of Credit Risk” by the Basel Committee on Banking Supervision are older and not binding.
- national standards⁵⁵
- increasing depreciation caused by credit defaults

The international and national regulations mentioned above consider the separation of the functional blocks within the organizational structure, and thus also in terms of hierarchy, a very suitable method of strengthening the “four-eyes principle” in the approval of loans, which is especially important from a risk perspective. The requirement of two independent votes⁵⁶ in the credit decision establishes a system of checks and balances: The mutual check of sales employees and risk analysts serves to reduce the risks associated with the credit approval process.

The increasing depreciation caused by credit defaults have led to an additional sensitization in terms of the mutual check of the people involved in the credit approval process. The complete separation of the organizational structure up to the executive level is regarded as an appropriate means of ensuring independence among the employees in sales and processing. Another reason for this development can be found in the increased role of risk analysis within the bank’s organization.

⁵⁵ Publications to be mentioned here include the “FMA Minimum Standards for Credit Business and Other Business with Counterparty Risk” by the Financial Market Authority as well as the “Minimum Requirements on Credit Business” (MaKs) by the German Bundesanstalt für Finanzdienstleistungsaufsicht (German Financial Supervisory Authority, BaFin).

⁵⁶ Exceptions to the strict separation of functions between risk analysis and sales will typically be found for low-risk credit transactions.

4.1.2.2 Appointing a Chief Risk Officer

Almost all large commercial banks have a *chief risk officer* (CRO) on their boards. The CRO typically heads the functional blocks of processing and credit risk management. In some banks, however, also the *chief credit officer* (CCO), the highest manager of the entire or at least parts of the functional block of processing, is a board member. In this case, the functional block of credit risk management and possibly some functions of processing report to the CRO.

In most cases, the separation between CCO and CRO is carried out if the functions of risk analysis and loan processing have a large number of employees. Furthermore, aggregating the responsibility of an executive for the approval of individual credit exposures as well as for the management of the entire credit risk portfolio may result in a conflict of interest.⁵⁷ The CRO then usually has a far smaller number of subordinates, but the large number of the individual issues to be handled often requires a closer professional cooperation with the executive in managing those employees. The management functions differ from each other accordingly. While the CRO usually heads organizational units that serve staff functions, the CCO is in charge of operational units.

4.1.2.3 Upgrading of Risk Analysis

Mainly as a result of the sharp increase in depreciation caused by credit defaults, risk analysis has become a focal issue of bank management in the last few years. It is not only the change in job title from loan officer to risk analyst that suggests the increasing significance and the new self-image of the processing units. Banks also need this upgrade in the significance of risk analysis from a human resources perspective. The increasing demands on risk analysis require new qualification profiles of employees. Recruiting, developing, and keeping junior staff for risk analysis has become a central issue in the personnel management of banks in the last few years, and banks take this into account in designing their organizational structures.

4.1.2.4 Centralization

The increasing pressure to reduce operating cost and the resulting efforts to standardize and simplify processes, as far as this is possible from a risk perspective, have led, among other things, to a strong centralization of many functions in the functional block of processing.

Increasingly, international commercial banks are combining the risk analysis units to handle corporate business. This development follows the centralization of risk analysis units for the retail segment - which has already been implemented in many cases - unless these transactions are concluded based on single vote decisions by sales directly. The specific design is often based on the territory covered by sales. In many cases, back office centers are set up that handle the tasks of risk analysis and loan processing. Specialized units, such as real estate valuation or risk analysis unit for foreign borrowers and entities, that are in charge of restructuring and workout of credit exposures are often set up in a central location. The consolidation into larger units allows a number

⁵⁷ Also see section 4.4.2.

of process adaptations. It is possible, for example, that increasing specialization can yield learning effects in larger units as the substitution problem that might otherwise take effect cannot occur here. Furthermore, it is possible to increase staff utilization by improving the distribution of the often volatile application volume. Further advantages that can result from centralization may include, for example, an increased application of internal best practices and (simplified) monitoring of job performance. The implementation of these centralization efforts is supported by the increasing use of electronic credit files, as this helps avoid the often time-consuming physical transport of credit folders and the operational risk involved. These advantages have to be weighed carefully against the relevant disadvantages. The geographical proximity of sales and risk analysis is effective in improving the coordination processes between these units, which is particularly true for the corporate customer segment. Therefore, regional centers are set up especially for this segment that allows the personal cooperation between employees of the sales and risk analysis units to continue. Even here, however, there is an increasing tendency of centralization.

The organizational guidelines applying to the bank as a whole should be taken into account in setting up the individual organizational units. These guidelines are discussed in the following subchapter.

4.1.3 Organizational Guidelines

The organizational structure should be designed in accordance with guidelines that are uniform throughout the bank. This makes it possible to design the organizational structure in a clear and consistent manner.

Organizational guidelines should cover three areas that serve as determinants in the structural design:

1. legal and strategic requirements
2. operational requirements
3. design principles

Each of these areas has to be defined in accordance with the bank's specific requirements.

4.1.3.1 Legal and Strategic Requirements

The guidelines should specifically refer to the legal regulations that have to be observed in the design of the organizational structure. As already stated above, legal regulations have been the major factor influencing the set-up of organizational structures in the last few years.

The design of the organizational structure should also reflect the bank's strategic orientation: growth segments should be included as early as possible.

4.1.3.2 Operational Requirements

Together with the legal and strategic requirements, operational considerations form the basic framework of the organizational structure. In particular, it must be ensured that

- decisions concerning the creation or shutdown of organizational units are always justified by a thorough and appropriate cost-benefit analysis;

- the span of control applied is commensurate with the respective business; as a rule, comparable units (in terms of tasks and management character⁵⁸) should be comparable in size ;
- activities have to be grouped strictly in terms of content; and
- the design of the organizational structure supports the implementation of risk-adjusted and efficient processes.

Organizational guidelines usually also contain reference values concerning the size of organizational units and the spans of control to be achieved. Due to the differing demands on the managers, the basic differentiation required specifies staff, sales, and processing units. These recommendations provide a helpful framework for the design or adaptation of organizational structures.

4.1.3.3 Design Principles

The design principles should stipulate the number of different management layers in the bank. Generally, each business unit should show the same number of management levels. In the past, the market position of sales often resulted in a smaller number of levels for these units (“seniority in the market”). It should be borne in mind that the organizational structure is basically a management structure that depicts the reporting chain. The practice of creating management positions for particularly deserving specialists has led to an impenetrable construction in organizational structures. Designing a clear and simple organizational structure increases transparency and helps avoid ambiguities and thus risks.

It has already been pointed out that risk aspects make it advisable to design the structures of sales and risk analysis units in an identical fashion. If credit decisions are escalated to a higher level, the subordination or superordination that otherwise exists (even if only indirectly) cannot lead to decisions that deal with the risk adequately.⁵⁹ Also, the need to strengthen risk analysis was already pointed out in connection with the discussion of general trends.

4.2 Management

It is the nature of hierarchical management structures that the aggregation of the subordinated functions is most comprehensive at the highest level. Every function that exists throughout the bank must ultimately be the responsibility of at least one executive. For the respective executives, this means a large degree of heterogeneity of the functions for which they are responsible.

The increasing complexity of the functions the executive is in charge of as well as the rising demands in terms of risk management caused by the product diversity in the international financial markets have led to the creation of committee structures in the organizations of large European commercial banks in addition to the executive board. Section 4.2.2 briefly deals with the general principles concerning the set-up of such committees. A more detailed discussion of the credit (risk) committees – which are particularly important for this guideline – whose main tasks are the management of credit risks as well as the preparation and decision concerning major loans can be found in section 4.4.4.

⁵⁸ Here, a distinction can be made between a purely managerial function, a primarily task-based function, and a combination of the two core functions mentioned.

⁵⁹ Also see section 4.3.1.

4.2.1 Executive Management

Independent of the number of executives, the guiding principle in designing the organizational structure should be the separation of sales from staff and processing functions.

It is not sufficient to describe the actual design of the organization with the only focus on risk aspects, but a number of factors that cannot be derived in a logically consistent manner also play a major role in designing the organization of management. A description would only be possible on a case-by-case basis and will thus not be offered in this guideline.

4.2.2 Risk Committees

Risk committees can be distinguished in terms of their function and/or the type of risk covered by the committees. Chart 34 shows a conceptual display of this structure and some examples of tasks fulfilled by the committee. As already mentioned earlier, section 4.4.4 will discuss the tasks of the committees in charge of credit risk management in more detail. Furthermore, subsection 2.5.2 in chapter 2 already outlined the significance of credit committees whose task lies in the operational decision concerning the credit approval for certain exposures delineated based on volume.

Chart 34

Committee Matrix Showing Possible Functions			
Definition and review of strategy	<ul style="list-style-type: none"> Goals of risk management Definition of risk strategy Determining the bank's overall risk-bearing capacity 	<ul style="list-style-type: none"> Definition and monitoring of credit risk strategy Responsibility for functioning and effective credit organization 	<ul style="list-style-type: none"> Definition and monitoring of market risk strategy Ensure functioning market risk review
	Implementation of the strategy for certain transactions	<ul style="list-style-type: none"> Assessment of individual risks in their significance for the bank as a whole, its strategy and reputation 	<ul style="list-style-type: none"> Individual loan decisions (highest level of authority)
	Total bank risk	Credit risk	Market risk

4.3 Processing

The functional block of processing covers four functions that are distinguished in terms of the tasks they cover. These are:

- risk analysis
- loan processing
- special functions
- restructuring/workout

4.3.1 Risk Analysis

The organizational structure of risk analysis should ideally be designed to mirror the process segmentation. The members of an organizational unit should focus on the execution of a certain credit approval process (e.g. standardized processing of residential construction loan applications by retail customers).

Four main arguments can be put forward here:

1. *Avoiding procedural and substantive errors*: Focusing employees on one process makes it possible to concentrate on the steps required for this process. This routine helps avoid procedural and substantive errors.
2. *Making it more difficult to “mix processes”*: In practice, it can often be observed that initiatives to introduce new – often lean and standardized – processes are hampered by the fact that the employees charged with risk analysis continue to apply the process steps they used to carry out.
3. *Ensuring stringent management*: The introduction of standardized credit approval processes requires managerial behavior different from that found in the conventional individual loan business. The qualification profile of executives in charge of centralized units dealing with loan processing contains mainly criteria concerning leadership and personnel management. Heading units that deal with complex credit approval processes, by contrast, mainly requires technical know-how and experience concerning the specific processes.
4. *Minimizing the number of interfaces*: The consolidation of processing segments in organizational units reduces the number of interfaces with other organizational units, which can help avoid procedural errors. Moreover, the speed and thus the efficiency of the process can be increased as the need for coordination among the organizational units is reduced as well.

These aspects should be accounted for by the separation of the relevant risk analysis units in the organizational structure. These aspects are especially important in the course of restructuring processes. In practice, one can also sometimes find that the organizational units are separated not only in terms of organizational structure, but also geographically. This is intended to further limit the effect of mixing processes.

The organizational structure of risk analysis is usually based on a five-level organizational model⁶⁰:

- Level 1 executive (chief risk officer)
- Level 2 division manager
- Level 3 head of department (HD)
- Level 4 group leader (GL)
- Level 5 specialists

Risk and efficiency aspects have to be weighed against each other in designing the structure. For low-volume business, the low level of total risk allows a focus on efficiency. The significance of risk aspects increases in line with the level of the volumes to be handled.

In practice, the loan processing segments are often found at the level of the heads of department, in some cases at the group leader level. The processing of

⁶⁰ In particularly large banks, one can often find a chief credit officer (CCO) between the division managers and the chief risk officer (CRO).

residential construction loans (which is often handled by centralized processing units nowadays) can serve as an example here: Typically, this process is carried out by one or more organizational units at level 3. At level 4, it is possible – for large numbers of employees – to additionally distinguish processing as to whether it deals with new or existing business (group leaders are thus responsible for processing either new or existing business). From a risk perspective, if processes are comparable, a separation of processing along the lines of new or existing business is preferable to a separation along sales channels, which can also be observed. This is mainly due to the effects that can be achieved if there is a match between the processes and the organizational units executing these processes.

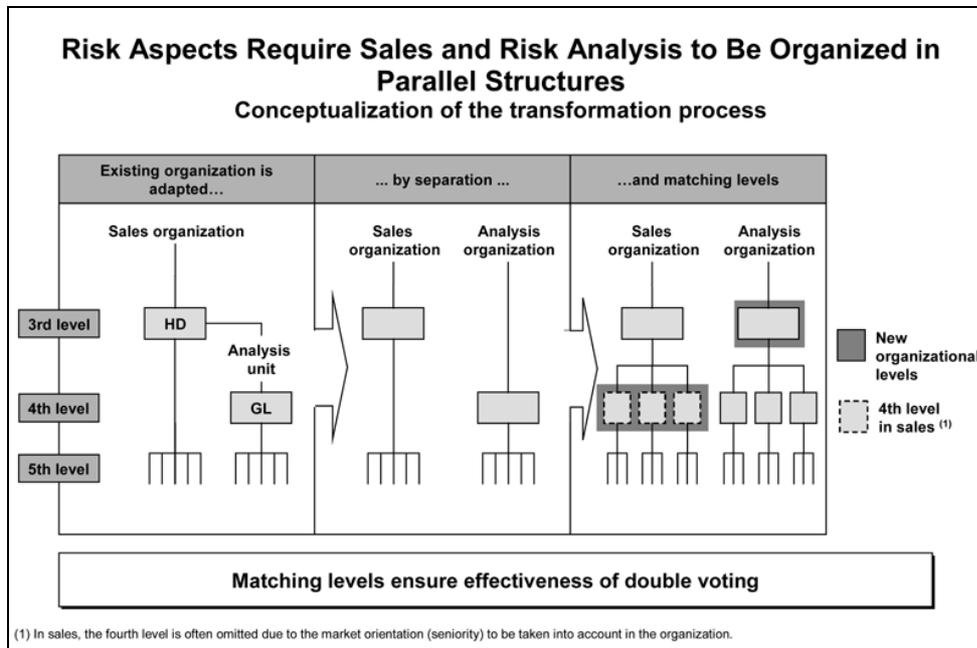
Process standardization makes it possible to manage large departments and groups. Accordingly, the line function of the head(s) of department(s) or the group leader(s) is restricted mainly to leadership in terms of hierarchical order rather than operational issues.

Another example – often relevant in practice – concerns risk analysis in the corporate customer segment.⁶¹ The general trend to separate sales and risk analysis within the organizational structure has led to massive changes. While the risk analysis and sales units used to be grouped under the same management, these functions are separated up to the highest organizational level now. Separating these functions, however, can lead to a skewed management structure: The market units are managed by a head of department, i.e. a third-level manager, while the risk analysis units are headed by a group leader, a fourth-level manager. This disparity is especially significant from a risk perspective, as optimal risk review requires a credit decision by two *mutually independent* employees of the *same hierarchical level*.

The independence requirement is fulfilled by abolishing the subordination of risk analysis to sales which was often found in the past. Still, this is only a first step, as this measure does not automatically put those employees at the same level, which should also be a goal of designing the structure of credit organization. Chart 35 illustrates the transformation process described above. Of course, it is important to ensure that the organizational structure is not expanded unnecessarily.

⁶¹ The complex segmentation of sales and credit approval processes is not dealt with any further at this point.

Chart 35



4.3.2 Loan Processing

The loan processing function comprises all activities in the course of credit approval and inventory management processes that do not include risk analysis activities. There are basically two options:

- Risk analysis and sales employees carry out loan processing activities in addition to their other tasks.
 - Loan processing is carried out by separate employees (loan officers).
- In choosing between the two options, it is necessary to weigh
- the learning effects to be achieved by specialization;
 - the rate differentiation that becomes possible; and
 - the possibility of focusing credit analysts and sales employees on their core activities
- against
- the coordination problems that may arise as a result.

The number of claims to be processed underlying each credit approval process is an important input factor in this consideration.

The increasing standardization and automation of credit approval processes has – at least in some processing segments – resulted in the risk analysis function resembling the loan processing function or actually rendered the processing function obsolete. In residential real estate finance, in particular, many banks now have electronic systems that eliminate the need for a manual processing function.

While this particular process segment is thus characterized by a situation in which the move to a centralized loan processing unit has already been rendered obsolete by new technological developments, the insufficient number of claims poses an obstacle to the introduction of separate loan processing units in other processing segments. Therefore, units with low numbers of claims and high

degrees of standardization and automation generally do not separate risk analysis and loan processing units. In these cases, one-stop processing is regarded as more expedient, efficient, and simpler. By contrast, the separation may make sense in case of a high need for specialized know-how or in case of sufficiently large numbers of claims in combination with a small proportion of automated processes.

Loan processing has to be distinguished from simple paperwork and general organizational activities. The employees charged with these tasks are nowadays often managed as separate clerical units that are flexible in executing jobs from several risk analysis and processing units.

4.3.3 Service Functions

It was pointed out in chapter 2 of this guideline that, in addition to the sales and risk analysis employees primarily in charge, further persons may be integrated in the credit approval process who contribute information that is rarely needed or very specific. If the number of claims justifies this move, these persons are combined in separate organizational units (e.g. organizational units specializing in the analysis of foreign companies). Again, this separate organizational placement aims at specializing activities and ensuring consistent management of these employees.

Typically, these are organizational units found at levels 2 or 3 (occasionally level 4) that are integrated in the credit organization in different ways.

Examples include the set-up of a centralized unit for the valuation of property or the risk analysis of foreign annual financial statements. The following arguments can be put forward:

- setting up a pool of know-how
- uniform quality standards in processing
- improving the smoothing out of fluctuations in utilization
- achieving learning effects

The organizational structure of these service functions can be designed along various criteria. As an example, we can look at property valuation: The structure here is typically based on four differentiating criteria:

- type of object (standard objects⁶² or individual objects⁶³)
- customer group (retail or corporate)⁶⁴
- Site of the property to be valued (domestic or abroad)
- stage of exposure (standardized or special servicing)

These criteria are often combined so that it is possible to observe many different structures in practice. Among other things, differentiating by stage of exposure leads to an assignment of property valuation to special servicing outside the centralized property valuation.

The spans of control and the size of the groups and departments are usually smaller than those in standardized processing. This is due to the increased focus on operational leadership in the special units.

⁶² Primarily residential real estate.

⁶³ Large projects, commercial real estate, etc.

⁶⁴ The customer group criterion is based on the same differentiation driver that also determines the type of object. Thus, the two criteria are interchangeable.

4.3.4 Restructuring/Workout

The separation of the restructuring and workout process from the standardized servicing process of credit exposures was already pointed out in chapter 2.

In larger banks, restructuring and workout are usually combined in a level 2 organizational unit. The separation between the two functions is effected at level 3. Any further subdivision of the two functions has to take into account the degree of centralization of each function.⁶⁵

If the number of claims justifies a specialization of single organizational units at level 2, this specialization is typically based on the criteria already discussed for the organizational structure used in the subdivision of the special functions. Here, too, one can find various combinations of these criteria in practice.

For the sake of completeness it should be mentioned that some large international banks have spun off the restructuring/workout of their property exposures to separate organizational units or legal entities in recent years.

4.4 Risk Management

The functional block of credit risk management covers three functions. These are:

- functions of the central credit staff
- credit risk controlling
- portfolio management

4.4.1 Functions of the Central Credit Staff

There are basically two functional blocks that can be distinguished within the central credit staff:

- development and maintenance of methods, instruments, and processes;
- special functions of the functional block of processing

A large number of processes, methods, and guidelines that need to be developed, maintained on a continuous basis, and improved to allow individual credit exposures to be assessed in a risk-specific manner and processed efficiently are required. These may include

- bank-specific internal guidelines (often referred to as “credit manual”)
- decision-making structure
- credit review processes
- principles of credit risk policy
- portfolio risk models
- internal risk reporting

Besides the development and maintenance of methods, instruments, and processes, some of the service functions of the functional block of processing described in section 4.3.3 are often assigned to the central credit staff. These are usually those functions that cannot specifically be assigned to one of the processing segments as they are required across various segments. These may include:

- analysis of balance sheets of foreign companies
- processing of funding applications
- processing of drafts and other specific collateral

⁶⁵ In contrast to the special function of property valuation, which can be said to be generally centralized at an international level, restructuring and workout are still usually handled by decentralized locations.

The organizational bundling and centralization of the functions within the central credit staff above all ensures that the methods, instruments, and processes to be applied in the bank show a high degree of uniformity. This is one of the central requirements to be able to carry out an ex-post review of the credit approval processes. In addition, the central organization can contribute to increasing efficiency as a result of learning effects and optimized capacity utilization.

Within the organizational structure, the central credit staff should be placed outside of sales and is often assigned directly to the chief risk officer. The specific organizational structure of the central credit staff should be set up in accordance with general organizational guidelines.⁶⁶ The organizational units of the central credit staff should also be subject to a minimum size stipulated in the guidelines on setting up the organizational structure.

4.4.2 Credit Risk Controlling

The management of credit risks comprises several process steps that cover various functions of risk management. These functions can be combined into three functional blocks to set up organizational units:

- strategic credit risk planning
- operational credit risk analysis
- credit risk controlling in a narrow sense

Strategic credit risk planning typically includes planning and monitoring the credit risk portfolio, defining the credit risk strategy, deriving the target portfolio structure, and aligning the actual credit risk with the guidelines of bank-wide capital allocation.

Operational credit risk analysis comprises identifying, measuring, and aggregating the credit risk at the portfolio level. The employees in charge of these activities apply the portfolio risk models developed in the central credit staff and prepare reports based on their analyses.

Credit risk controlling in a narrow sense covers, among other things, defining and monitoring limits, deriving recommendations for courses of action if limits are exceeded, and setting risk-adjusted prices.

These individual functions are usually found at level 3 in the organizational structure, with organizational units often being set up at level 4 below.

In most banks, the activities of credit risk management are combined into an organizational unit of the second level reporting to the chief risk officer. If the chief risk officer is also in charge of the functions of the processing bundle described in section 4.3, this may lead to a conflict of interest. This manager is then responsible for individual credit risks as well as for managing the overall credit risk portfolio. In order to preempt potential conflicts of interest, some banks assign the two functional bundles to two managers, with one manager in charge of the processing bundle, and the other responsible for the risk management bundle. Only a few very large banks use this construction, however.

Managing the interfaces between credit risk controlling and bank-wide capital allocation plays a vital role: In spite of the organizational separation of credit risk controlling and the management of market and operational risks,

⁶⁶ Also see section 4.1.3.

it is important to ensure a bank-wide risk perspective and risk controlling. The necessary data formats, reporting modalities, and the methods and models used to analyze the risks should be harmonized. This can be achieved by providing centralized guidelines on credit risk management. Setting up credit risk committees is a further option to integrate credit risk controlling in bank-wide capital allocation.

4.4.3 Portfolio Management

In some banks, credit risk management also includes one or more organizational units that carry out active credit portfolio management in addition to the functional groups mentioned so far. The significance of active portfolio management is found most specifically in making existing credit portfolio structures more flexible by selling and buying claims in the capital market. The increasing importance of active portfolio management as well as the high degree of responsibility of the managers in charge have already led some banks to separate credit portfolio management from risk management in their organizational structures.⁶⁷ It is even possible to find portfolio management as a separate profit center in some cases.

4.4.4 Credit Risk Committees

Credit risk committees are a special form of the risk committees described in section 4.2.2. The purpose of implementing credit risk committees is the integration of the respective decision makers from different organizational units in the risk management process. This committee is kind of a “hybrid” organizational form that avoids the need to pry away the persons involved from the organizational units headed by them.

A credit risk committee makes various decisions that are relevant to risk, e.g.:

- decision concerning the risk strategy;
- decisions in terms of capital allocation and defining limits in line with the risk strategy;
- decisions on measures to be taken if limits are exceeded.

Credit risk committees must be distinguished from those committees (often referred to as credit committees) which have to make decisions on credit approval, extension, and overdrafts for those exposures which the decision-making structure requires to be handled by the credit committee.⁶⁸

The composition of the committee is based on the organizational structure and responsibilities. Usually, one would find the chief risk officer, the chief credit officer, the members of the executive board and the division managers of the business units, the division manager of (bank-wide) risk management control, the division manager of the central credit staff, and (if applicable) the division manager of portfolio management. The committee usually meets at least once a month and whenever necessary.

The advantages of the committee structure are the holistic perspective of the credit risk, the possibility to make decision based on this holistic approach, as

⁶⁷ These banks typically show credit portfolio management as an organizational unit at level 4.

⁶⁸ Also see section 2.5.2.4.

well as the fact that several areas can be integrated resulting in better acceptance of the decisions. Similarly, the integration of the chief risk officer and bank-wide risk management control ensures that the credit risk is analyzed with regard to the bank's overall risk. The committee structure is suitable for smaller and larger banks alike.

5 Internal Auditing

5.1 Introduction

The significance of as well as the tasks covered by the internal audit divisions of credit institutions will continue to increase not only because of Basel II. An internal audit function that actually wants to fulfill its tasks effectively and appropriately is subject to increasingly complex demands due to fundamental changes in the structure of the banking landscape in general and of the individual credit institutions in particular, changing legal and economic conditions, internationalization, and an increasing application of technology. Mainly as a result of Basel II, banking supervision will place a particular emphasis on a functioning internal audit system, and internal audit employees will face particularly high demands on their qualification.

Besides *internal auditing*, the *internal review system* is a necessary complementary component of a credit institution's internal monitoring process ("internal monitoring system").

Pursuant to § 42 para 1 of the Austrian Banking Act, internal auditing is mandatory for credit institutions. Internal auditing under the Austrian Banking Act is deemed to be a unit to be set up by the credit institutions by law reporting directly to the executive board; this unit's sole purpose is the continuous and comprehensive review of compliance with legal regulations and proper as well as appropriate execution of the company's business.

With regard to *internal review procedures*, the Austrian Banking Act mandates setting up administrative, accounting, and control procedures that are required to capture and assess the risks in terms of the bank's business and operations which may result from new types of transactions as well as parallel risks. In addition, further provisions – particularly in the Austrian Banking Act, the Austrian Securities Supervision Act, and the Austrian Stock Market Act - stipulate the implementation of internal review procedures in credit institutions. These reviews are repeatedly referred to in the other chapters of this guideline implicitly or explicitly.

In contrast to internal auditing, the internal review system comprises all forms of monitoring measures that are directly or indirectly integrated in the procedures to be monitored (process-based monitoring) and that are carried out by persons or organizational units involved in the respective procedures which are often responsible for the result of the processes to be monitored as well as the monitoring result itself.

Internal auditing is thus characterized by a *process-independent review*. Therefore, it is necessary to make sure that internal auditing is independent and objective concerning the processes to be reviewed, while the internal review system carries out *process-based* monitoring by the persons involved in the respective processes.

5.2 Significance and Tasks of Internal Auditing

A comprehensive substantive and formal review by internal auditing as well as appropriate information of the credit institution's corporate bodies are intended to limit bank-specific risks as well as the risk of wrong business decisions.

However, the significance of internal auditing transcends the credit institution and also applies to the entire regulatory framework. This importance

results mainly from its permanent presence in the credit institution, the continuous audit of all areas, processes, procedures, and systems, as well as the knowledge thus gained. In its capacity as an internal monitoring system it can detect risks, dangers, and deficiencies of the credit institution before the external auditor and banking supervision can, and it can report these to the executives.

The major prerequisites needed for effective internal auditing to be mentioned here are, above all, an appropriate organizational structure, an adequate endowment of internal auditing, its independence on the one hand, and its integration in the information flow on the other, as well as properly functioning communication with the executives.

5.2.1 General Audit Areas

Under the Austrian Banking Act, internal auditing has to audit the entire credit institution for compliance with legal regulations and proper as well as appropriate execution of the company's business continuously and comprehensively. The following audit areas are particularly relevant:

- all operational and business procedures within the credit institution
- risk management and risk management control
- the internal review system
- the bank's internal rules and directives and
- all mandatory audit areas (especially large-exposure investments, money laundering and compliance, diligence, reporting requirements, securities trading book)

For credit institution groups, internal auditing of the parent institution has the additional task of internal group auditing.

5.2.2 Reviewing Credit Transactions

In the course of reviewing credit transactions by internal auditing (credit review), one can distinguish between substantive and formal credit review:

- Under the substantive credit review, the substance of the transaction, e.g. credit rating, risk assessment, and value of the collateral, has to be reviewed. For credit and collateral agreements, for example, it is necessary to check the legitimacy of their creation and their enforceability.
- Under a *formal credit review*, it is checked whether the credit transaction and the documents are in order and complete, with a special focus on the compliance with legal and internal regulations, guidelines, and documentation. With regard to granting a loan it will be necessary, for example, to check whether the loan applications were duly signed, if the borrower's property and risk situation were recorded, if the debt service capacity was calculated and the current exposure situation was determined, if the account manager provided his opinion (including an assessment of the borrower's credit standing), and if the required documents covering credit rating, loan request, and agreed collateral are included.

In addition, the Austrian Banking Act (cf. for example § 26b, § 27, § 39) prescribes certain *system reviews* that are *related to credit transactions*. Thus, internal auditing has to check

- the *appropriateness* and the

- *application* of the administrative, accounting, and control procedures that are required to *capture and assess*
- the credit institution’s business and operational risks;
- the risks that may arise from new types of business; and
- parallel risks
- of large exposures and any changes in them as well as
- of monitoring those with regard to conforming to the bank’s credit policy.

For the *enclosure showing primary company data*, for example, it is essential to check whether it matches the details in the credit agreement and whether it is current in terms of the borrower, its credit standing, loans and collateral (customer data, credit rating information, credit agreements, valuation of collateral, estimates, encumbrances, balance sheets, etc.).

Furthermore, internal auditing has to review *account management* and *credit monitoring*. This includes, for example, reviewing and monitoring:

- account management in general
- troubled loans
- specific loan loss provisions and write-offs of claims
- overdrafts and
- reminder procedures

5.3 Audits

5.3.1 Planning and Executing Audits

Every year, internal auditing should prepare an auditing plan to be approved by the executive board according to which the audits are carried out.

This auditing plan should be carried out in a risk-oriented manner, taking into account size and nature of the credit institution, as well as type, volume, complexity, and risk level of the bank’s activities. The frequency of auditing the individual audit areas should be stipulated in the bank’s internal guidelines for internal auditing. In addition to the audits scheduled in the auditing plan, internal auditing should also carry out event-triggered, unscheduled audits. Such special audits are particularly necessary if there are indications of material deficiencies.

5.3.2 Reporting

A comprehensive written audit report has to be prepared following each audit. It will usually be expedient to first report to the head of the audited organizational unit on the audit’s findings in the course of a final meeting and to offer him the opportunity to comment on the findings, with these comments to be taken into account in the audit report. Subsequently, all executives are informed in writing.

5.3.3 Follow-up

Finally, it is the task of internal auditing to monitor the swift correction of any problems detected in the audit as well as the implementation of its recommendations in a suitable form, and – if necessary – to schedule a follow-up audit.

5.4 Internal Auditing and Basel II

If Basel II is regarded from the perspective of internal auditing, one can find numerous or changed areas of application for internal auditing.

Credit risk

If a credit institution decides to use the *basic internal ratings-based (IRB) approach* or the *advanced IRB approach*, internal auditing has to check compliance with all minimum requirements, with a special focus on the following audit areas:

- reliability of rating system and processes as well as their implementation
- procedures to estimate the parameters LGD, PD, EAD, and CCF (credit conversion factors)

Operational risk

Institutions using the standardized approach are specifically required to have the assignment of gross income to the individual business areas reviewed by internal auditing. Institutions using an *advanced measurement approach (AMA approach)* are required to have the procedures and methods for the management of operational risk and the quality of the overall risk management reviewed by internal auditing or an external auditor.

5.4.1 Audit Planning

Based on the newly identified audit areas of internal auditing, Basel II will also require an adaptation of audit planning, including the frequency of audits, as well as additional capacities. Thus, material audit areas that have to be audited at least once a year have to be determined. Such material audit areas would include the following:

- risk strategy
- completeness and credibility of rating assignment
- monitoring of rating systems and processes
- reviewing procedure and measuring methods for the management of credit risks and operational risk
- IT systems
- internal validation procedures
- limit system
- internal reporting

As internal auditing can also be applied to projects concurrently, it would make sense to include it already in the implementation stage of Basel II.

It has to be borne in mind as well that the new requirements for internal auditing resulting from Basel II are not only quantitative but also qualitative in nature, which means that its members need to be adequately informed about Basel II.

6 Bibliography

- Arain, Karim:** Management von Kreditausfallrisiken. Peter Lang, 2004.
- Bessis, Joel:** Risk Management in Banking. 2nd ed. Wiley 2002.
- Bol, Georg (et.al) Ed.:** Credit risk: Measurement, Evaluation and Management. Physica, 2003.
- Cossin, Didier & Hugues Pirotte:** Advanced Credit Risk Analysis: Financial Approaches and Mathematical Models to Assess, Price and Manage Credit Risk. Wiley, 2000.
- Dicken, André Jacques:** Kreditwürdigkeitsprüfung. 3rd ed. Erich Schmidt, 2003.
- Eller, Roland & Walter Gruber & Markus Reif (Eds.):** Handbuch Gesamtbanksteuerung: Integration von Markt-, Kredit- und operationalen Risiken. Schäffer-Poeschel, 2001.
- Everling, Oliver & Walburga Sarcher:** Rating-Lexikon. VÖB-Service, 2003.
- Füser, Karsten:** Intelligentes Scoring und Rating: Moderne Verfahren zur Kreditwürdigkeitsprüfung. Gabler, 2001.
- Gaeta, Gordian:** The Certainty of Credit Risk: Its Measurement and Management. Wiley, 2002.
- Glantz, Morton:** Managing Bank Risk: An Introduction to Broad-base Credit Engineering. Academic Press, 2003.
- Grof, Erika:** Risikocontrolling und Kreditwürdigkeitsprüfung: risikoorientiertes Bankencontrolling unter Berücksichtigung neuerer Bonitätsprüfungsverfahren. Vienna: Linde, 2002.
- Grundke, Peter:** Modellierung und Bewertung von Kreditrisiken. Deutscher Universitäts-Verl. 2003.
- Grundwald, Egon & Stephan Grunwald:** Bonitätsanalyse im Firmenkundengeschäft: Handbuch Risikomanagement und Rating. 2nd ed. Schäffer-Poeschel, 2001.
- Gundlach, Matthias & Frank Lehrbass:** CreditRisk+ in the Banking Industry. Springer, 2004.
- Hertenstein, Karl-Heinz & Dirk Müller:** Risikocontrolling im Kreditgeschäft als Bestandteil eines ganzheitlichen Risikomanagementkonzeptes. Dt. Sparkassen-Verl., 2002.
- Hose, Christian:** Rating und Kreditzinsen: Chancen für Kunden und Kreditinstitute im Rahmen von Basel II. Deutscher Genossenschafts-Verl. 2002.
- Kley, Christoph R.:** Mittelstands-Rating: externe Credit Ratings und die Finanzierung mittelständischer Unternehmen. Deutscher Universitäts-Verl. 2003.
- Koch, Wolfgang & Jürgen Wegmann:** Praktiker-Handbuch Rating: Leitfaden für mittelständische Unternehmen und für Banken. Schäffer Poeschel, 2003.
- OeNB und FMA:** Best Practice im Risikomanagement von Verbriefungen, Vienna, 2004.